Final Noise Study
144th Fighter Wing at
Fresno Yosemite International Airport (FAT), California
for the Air National Guard
F-15EX Eagle II & F-35A
Operational Beddowns
Environmental Impact Statement

January 2024

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ACRONYMS AND ABBREVIATIONS

144 FW	144th Fighter Wing
AAD	Average Annual Day
AEDT	Aviation Environmental Design Tool
AGL	Above Ground Level
ANG	Air National Guard
ANSI	American National Standards Institute
ASA	Acoustical Society of America
ATCT	Airport Traffic Control Tower
FAT	Fresno Yosemite International Airport
CFR	Code of Federal Regulations
CDNL	C-weighted Day-Night Average Sound Level
CNEL	Community Noise Equivalent Level
$CNEL_{mr}$	Onset-Rate Adjusted Monthly Community Noise Equivalent Level
DAF	Department of the Air Force
dB	Decibel
dBA	A-weighted decibel
DNL	Day-Night Average Sound Level
DNWG	Department of Defense Noise Working Group
DoD	Department of Defense
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration
FAT	Fresno Yosemite International Airport
FICON	Federal Interagency Committee on Noise
FY	Fiscal Year
Hz	Hertz
$kPa\text{-}s/m^2$	kilopascal-seconds per square meter
L_{dnmr}	Onset-Rate Adjusted Monthly Day-Night Average A-weighted Sound Level
L_{eq}	Equivalent Sound Level
L_{max}	Maximum Sound Level
MOA	Military Operations Area
MRNmap	Military Operating Area and Range Noise Model
MSL	mean sea level
NA	Number of Events at or above a specified threshold
NED	National Elevation Dataset
NEM	Noise Exposure Map
NGB	National Guard Bureau
OPSNET	Operations Network
PA	Probability of Awakening
PAA	Primary Aerospace Vehicle Authorized
PDARS	Performance Data Analysis and Reporting System
PHL	Potential for Hearing Loss
POI	Point of Interest
SEL	Sound Exposure Level
SUA	Special Use Airspace
TA	Time Above a specified level
U.S.	United States
USGS	United States Geological Survey
W-	Warning Area

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1.0 INTRODUCTION

1.1 BACKGROUND

The United States (U.S.) Department of the Air Force (DAF) and National Guard Bureau (NGB) propose to maintain the combat capability of the Air National Guard (ANG) by recapitalizing the remaining F-15C/D aircraft, which are being retired due to age and associated maintenance costs. There are three remaining ANG units that are still flying the F-15C/D aircraft (that are not already undergoing similar evaluation); these include the 104th Fighter Wing at Westfield-Barnes Regional Airport (BAF) in Westfield, Massachusetts; the 144th Fighter Wing (144 FW) at Fresno Yosemite International Airport (FAT) in Fresno, California (Figure 1-1); and the 159th Fighter Wing at Naval Air Station Joint Reserve Base New Orleans, in Belle Chasse, Louisiana. Figure 1-2 depicts the 144 FW's associated training airspace.

This noise study is in support of the beddown, operation, and associated infrastructure construction of one squadron of F-15EX Eagle II (F-15EX) aircraft or one squadron of F-35A Lightning II (F-35A) aircraft squadrons at FAT. One of these aircraft could replace the aging fleet of F-15C fighter aircraft at FAT, which is the subject of this Noise Study.

Civilian aircraft noise modeling was accomplished using the Aviation Environmental Design Tool (AEDT) Version 3e software program. The data (numbers and types of aircraft, time of day, runway assignments, type of operation) used were developed with data obtained from recent noise studies and coordination with representatives from the Federal Aviation Administration (FAA), air traffic controllers, and the NGB. Actual times were used to assign operations to acoustic day and night, and, where applicable, using daylight savings time conversion. Standardized flight profile data (power settings, airspeeds, etc.) available with AEDT were used for civilian aircraft operations.

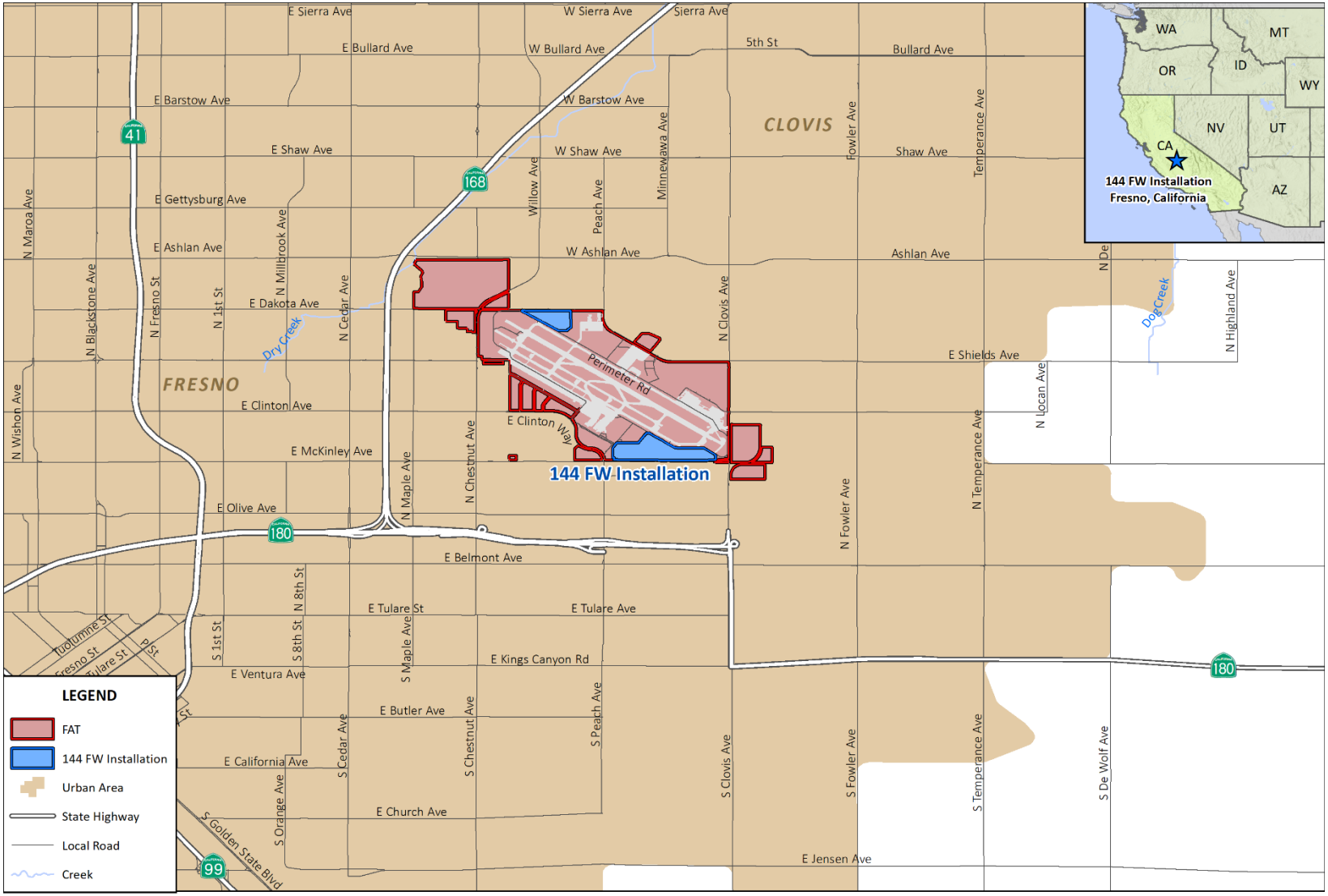

Figure 1-1 Location of the 144 FW at FAT

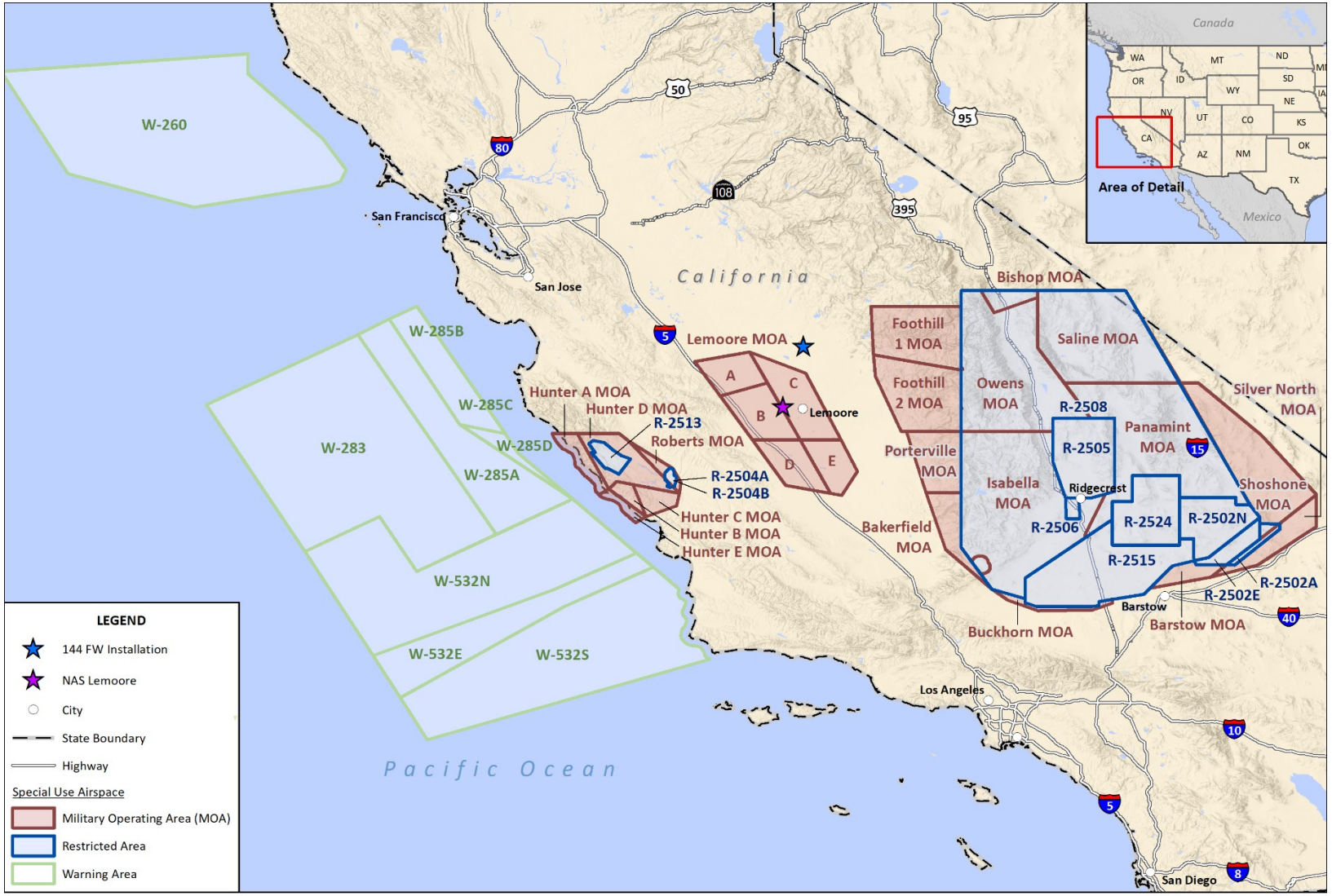

Figure 1-2 Airspace Associated with the 144 FW at FAT

In situations that require the preparation of a noise analysis in accordance with FAA Order 1050.1F, information in forecasts is a key data point when preparing this type of analysis under the National Environmental Policy Act. Airports can rely on a forecast they prepare, and is approved by the FAA, or seek approval from the FAA to use the Terminal Area Forecast (TAF), which is issued annually and projects civilian and commercial operations into the near future, and these projections are utilized to determine operations levels associated with the noise impact analysis. However, operational data based on a TAF was not utilized to inform development of the inputs for the noise modeling and subsequent noise impact analysis described in this noise study and corresponding draft Environmental Impact Statement (EIS). Instead, the NGB relied upon the 'best available information' at the time of preparing this analysis, which was a combination of civilian aircraft operations as modeled in prior Noise Exposure Map (NEM) updates completed under 14 Code of Federal Regulations (CFR) Part 150 and average historical civilian operations levels from the FAA Operations Network (OPSNET). For FAT, the 2017 NEM update 2022 forecast condition civilian operations were used, and then scaled to a 3-year historical average of recorded operations levels in the FAA OPSNET from 2017–2019. This scaling was done to account for a significant decrease in civil air traffic associated with COVID-19 that was not reflected in the 2017 NEM update. This noise study and corresponding EIS assumed that the historical 3-year average of civilian operations as recorded in the FAA OPSNET from 2017–2019 was representative of when civilian air traffic associated with this action would return to pre-COVID-19 conditions at FAT and represented the 'best available' data source from which to forecast civilian operations at the time the Proposed Action or alternatives would be implemented. This noise study also assumed that there would not be substantial additional growth in civilian operations at FAT above and beyond the pre-COVID-19 conditions at the time the Proposed Action or alternatives would be implemented. Thus, the No Action Alternative for this noise study and EIS for FAT was assumed to be equivalent to the existing conditions prior to COVID-19 interruptions in terms of aircraft and airfield operations.

Though the analysis of aircraft (military and civil) noise impacts was completed during the development of this noise study and corresponding draft EIS, updated civil aircraft operations data became available for the FAA's 2022 TAF in February 2023 prior to the planned date for the publication of the draft EIS for public review. Therefore, before publishing the draft EIS for public review, the NGB in coordination with the FAA, determined it was appropriate to consider if this updated civil aircraft operations data would change the results of the noise analysis, and conducted a comparative review. Section 7.0 of this noise study presents the additional, comparative review of the newly available 2022 civilian aircraft fleet mix and FAA 2022 TAF and evaluates their potential effects on the noise analysis presented in this noise study and the EIS to best inform both the public and the decision makers. This review found that the updates to projections of civil aircraft operations and fleet mix would result in relatively minor changes to the projected noise contours as shown in Section 7.0. Therefore, noise impacts and the conclusions based upon the FAA 2022 TAF and 2025 forecast civilian aircraft fleet mix would not substantially change from those currently presented in this noise study and draft EIS. Estimated changes in acreages and number of individuals affected utilizing the revised 2022 TAF and 2025 forecast civilian fleet mix can be found in Section 7.0.

Military flight operations were based on interviews with members of the 144 FW and updated as needed to reflect current operational data for based military operations, which were determined to be an accurate estimate of anticipated military operations several years into the future. Transient military operations remain consistent with the NEM Update with only minor adjustments to flight tracks based upon military personnel input.

This analysis also includes various possible afterburner usage scenarios. The F-35A is modeled with 5, 50, and 95 percent afterburner usage for departure operations, while the F-15EX is modeled with 50 and 80 percent afterburner usage for departures. All other flight activity would remain consistent with the current conditions.

Thus, within this Noise Study for the 144 FW, the following aircraft alternatives and afterburner usage scenarios are modeled:

- F-15C – 18 Primary Aerospace Vehicle Authorized (PAA) (existing conditions)
- F-15EX – 21 PAA (proposed alternative)
  - 15 percent afterburner usage
  - 50 percent afterburner usage
- F-35A – 21 PAA (proposed alternative)
  - 5 percent afterburner usage
  - 50 percent afterburner usage
  - 95 percent afterburner usage

1.2 DOCUMENT STRUCTURE

Section 1.0 introduced this study; while Section 2.0 describes the methodology used in the analysis. Section 3.0 provides the modeling data used and the noise exposure for the current operations (existing conditions). Section 4.0 provides the noise exposure for the proposed F-15EX and F-35A (and their various afterburner scenarios) and Section 5.0 describes the No Action Alternative. Section 6.0 presents conclusions, Section 7.0 presents the TAF analysis, and Section 8.0 provides the references.

2.0 METHODOLOGY

The Department of Defense (DoD) and the Federal Interagency Committee on Noise (FICON) (1978) outline the types of metrics to describe noise exposure for environmental impact assessment, while the Defense Noise Working Group (DNWG) provides guidance on military noise modeling methodology. The following subsections describe these noise metrics and noise modeling methodology.

2.1 NOISE MODELING AND PRIMARY NOISE METRICS

The DoD prescribes use of the Noisemap suite of computer programs (Wyle 1998; Wasmer Consulting 2006) containing the core computational programs called "NMAP," version 7.3, and "MRNMap," version 3.0 and the FAA's AEDT 3e for environmental analysis of aircraft noise[1]. For this noise study, the Noisemap suite of programs refers to BASEOPS as the input module, Noisemap as the noise model for predicting noise exposure in the airfield environment, and MRNMap as the noise model used to predict noise exposure in the Special Use Airspace (SUA). Supersonic noise is estimated with BOOMAP96. NMPLOT is the tool used to combine the noise contours produced by Noisemap and AEDT into a single noise exposure map. Table 2-1 presents noise modeling parameters used in this analysis.

Human hearing sensitivity to differing sound pitch, measured in cycles per second or hertz (Hz), varies by frequency. To account for this effect, sound measured for environmental analysis utilizes A-weighting, which emphasizes sound roughly within the range of typical speech and de-emphasizes very low and very

[1] AEDT version 3(e) is the most current version available (https://aedt.faa.gov/3e_information.aspx).

high frequency sounds. All decibels (dB) presented in this study utilize A-weighted (dBA or dB[A]) but are presented as dB for brevity, unless otherwise noted.

Table 2-1 Noise Modeling Parameters

Software	***Analysis***	***Version***
NMAP	Airfield noise – military aircraft	7.3
AEDT	Airfield noise – civilian aircraft	3e
MRNMap	Airspace Noise (subsonic)	3.0
BOOMAP	Airspace Noise (supersonic)	96
Parameter	***Description***	
Receiver Grid Spacing	500 ft in x and y	
Metrics	CNEL and CDNL (primary) $CNEL_{mr}$, SEL, L_{max}, L_{eq}, NA	
Basis	AAD Operations (NMAP/AEDT); Average Month (MRNMap)	
Topography		
Elevation Data Source	USGS 30m NED	
Elevation Grid Spacing	500 ft in x and y	
Impedance Data Source	USGS Hydrography DLG	
Impedance Grid spacing	500 ft in x and y	
Flow Resistivity of Ground (soft/hard)	225 kPa-s/m^2 / 100,000 kPa-s/m^2	
Military Modeled Weather (Monthly Averages 2015-2020; April selected)[1]		
Temperature	60 °F	
Relative Humidity	57.5%	
Barometric Pressure	30.01 in Hg	

Note: [1]AEDT modeling utilized standard weather conditions.

Legend: °F = degrees Fahrenheit; % = percent; AAD = Average Annual Day; AEDT = Aviation Environmental Design Tool; CDNL = C-weighted Day-Night Average Sound Level; CNEL = Community Noise Equivalent Level; $CNEL_{mr}$ = Onset-Rate Adjusted Monthly Community Noise Equivalent Level; DLG = Digital Line Graph; ft = feet; in Hg = inches Mercury; kPa-s/m^2 = kilopascal-seconds per square meter; L_{eq} = Equivalent Sound Level; L_{max} = maximum sound level; m = meters; NED = National Elevation Dataset; SEL = Sound Exposure Level; USGS = United States Geological Survey.

The primary noise metric utilized in the U.S. for noise impacts is the Day-Night Average Sound Level (L_{dn}, also written as DNL), which is A-weighted applicable for subsonic aircraft operations. DNL is a cumulative metric that includes all noise events occurring in a 24-hour period with a nighttime noise weighting applied to events occurring after 10 p.m. (2200) and before 7 a.m. (0700). The daytime period is defined as 7 a.m. (0700) to 10 p.m. (2200). An adjustment (weighting) of 10 dB is added to events occurring during the nighttime period to account for the added intrusiveness while people are most likely to be relaxing at home or sleeping. The Community Noise Equivalent Level (CNEL) noise metric, specified by the State of California for environmental noise like airport operations, mirrors DNL with the same energy-averaged sound level measured over a 24-hour period and 10 dB weighting for events occurring between 10 p.m. and 7 a.m. (2200 and 0700). However, CNEL adds an evening weighting by multiplying evening events by 3 (equivalent to 4.77 dB weighting) if occurring between 7 p.m. and 10 p.m. (1900 and 2200). Note that these periods of the day are often different than the "day" and "night" used commonly in military aviation, which are directly related to the times of sunrise and sunset applicable for military training in dark conditions. These times vary latitudinally, and throughout the year with the seasonal changes.

Similar to DNL, C-weighted Day-Night Average Sound Level (CDNL) represents a cumulative metric that includes all noise events occurring in a 24-hour period with a nighttime noise weighting applied to events occurring after 10 p.m. (2200) and before 7 a.m. (0700). However, CDNL is C-weighted for impulsive

sounds that contain greater low frequency noise, like ordnance or supersonic "booms," to better reflect the level of annoyance generated by these activities.

DoD Noise Program Policy (DoD Instruction 4715.13, 28 January 2020) requires the use of the DNL noise metric (or CNEL if the activity occurs within the state of California) to describe aircraft noise exposure levels at airfields based on average annual day (AAD) averaged over 365 days for purpose of long-term compatible land use planning. Consistent with that standard, this study analyzed both military and civil operations at the airfield on an average annual basis. Flight activity in the SUA can vary throughout the year, so often the SUA analysis considers the 'busiest month' to better reflect flight activity during an average day of the 'worst month' of the year. However, training by the 144 FW remains consistent throughout the year so that there was not a difference between the average month and the busiest month.

Assessment of noise associated with a proposed action requires prediction of future conditions that cannot be easily measured until after implementation or would require excessive cost or time to measure. The solution to this includes the use of computer software to simulate the future conditions, as detailed in the following sections. A recent congressionally mandated study compared the accuracy of noise modeling methods described in this section to real-world field measurements. The report found that DoD-approved noise models operate as intended providing accurate prediction of noise exposure levels from aircraft operations for use in impact assessments and long-term land use planning (Department of the Navy 2021). The study also determined that the largest variable in any aircraft noise-modeling effort is the expected operational flight parameter data, such as runway and flight track utilization, altitudes at various points in the flight track, engine power settings, and other parameters.

2.1.1 Fresno Yosemite International Airport (FAT)

The City of Fresno owns FAT and is staffed by the FAA. This section discusses the airport facilities, including the airspace, airport traffic control tower (ATCT), and runways at FAT and the aircraft noise modeling.

2.1.1.1 Airport Facilities

Airspace

The airspace surrounding FAT, as with all airspace within the U.S. National Airspace System, is classified into a number of classes (A, B, C, D, E and G) based on availability of air traffic control services and/or restrictions of ownership (civilian versus military). FAT is located within Class C airspace, which is positively controlled by an ATCT that operates 24-hours daily. FAT's Class C airspace extends from the surface to 4,000 feet above ground level (AGL) and has an inner and outer diameter of 5 and 10 nautical miles, respectively. The FAT Class C airspace is bordered to the southwest by Lemoore C Military Operations Area (MOA) and to the east by Foothill 1 and 2 MOAs.

Air Traffic Control Tower

The airport's ATCT is an FAA facility which is staffed 24-hours daily. The ATCT, located on an airfield, is responsible for the movement of aircraft on and around the immediate airport. The FAA's Terminal Radar Control facility is also co-located with the ATCT.

Runways

FAT is comprised of two runways parallel to one another oriented in a southeast and northwest direction, as depicted in Figure 2-1. The majority of aircraft operations and nearly all DoD aircraft operations occur along Runway 11L/29R which is 9,539 feet in length and 150 feet in width. Runway 11R/29L is also 9,539 feet in length and 150 feet in width.

Aircraft Noise Modeling

Standard noise modeling methodology was carried forward adhering to both FAA and DoD noise modeling criteria. Modeling of noise, using the Noisemap software suite and AEDT, was accomplished by determining and building each aircraft's flight tracks (paths over the ground) and profiles, which includes altitude, airspeed, power settings, and other flight conditions. Included in this development was the confirmation and revisions associated with the airfield, which included runway locations and dimensions, elevations, and whether displaced thresholds existed. Table 2-2 describes airfield details utilized within this noise study. This information was developed iteratively with a team primarily made up of representatives from the installation's flying squadrons, air traffic controllers, FAT airport management, as well as the NGB. The data was compiled in a data validation package, reviewed by the team, and approved for use by the NGB team prior to modeling (NGB 2022). This data has been combined with the numbers of each type of operation by aircraft/track/profile, local climate, terrain surrounding the airfield, and similar data related to aircraft engine runs that occur at specific locations on the ground (e.g., pre- and post-flight and maintenance activities). Appendix A shows summary flight tracks, as well as representative flight profiles for the aircraft operations modeled. No helipads were modeled. Civil helicopter operations were modeled on runways and military to their landing locations as depicted in Appendix A.

The proposed F-15EX noise modeling utilized recent measurements obtained from 2022 at Eglin Air Force Base, while other aircraft types used existing data within the NMAP's Noisefile for fixed wing aircraft and NC Spheres for rotary-wing aircraft.

Table 2-2 FAT Airfield Details for Noise Modeling

Runway[2]	*Start*[1]	*End*[1]	*Length*	*Width*	*Elevation*	*Displaced Threshold*	*Traffic Pattern*	*Instrument Approach*
11L	36.784002N 119.73009W	36.76884N 119.70352W	9,539 ft	150 ft	333.0 ft	N/A	Left	LOC/DME
11R	36.783062N 119.7342W	36.770334N 119.71012W	8,008 ft	150 ft	330.0 ft	N/A	Right	N/A
29L	36.770334N 119.71012W	36.783062N 119.7342W	8,008 ft	150 ft	329.9 ft	N/A	Left	N/A
29R	36.76884N 119.70352W	36.784002N 119.73009W	9,539 ft	150 ft	332.0 ft	312 ft	Right	ILS/DME

Note: [1]Start and End in Decimal Degrees.
[2]Helicopter operations modeled to runways.
Legend: FAT = Fresno Yosemite International Airport; ft = feet; N/A=non-applicable; ILS=Instrument Lighting System.
Source: AIRNAV 2023.

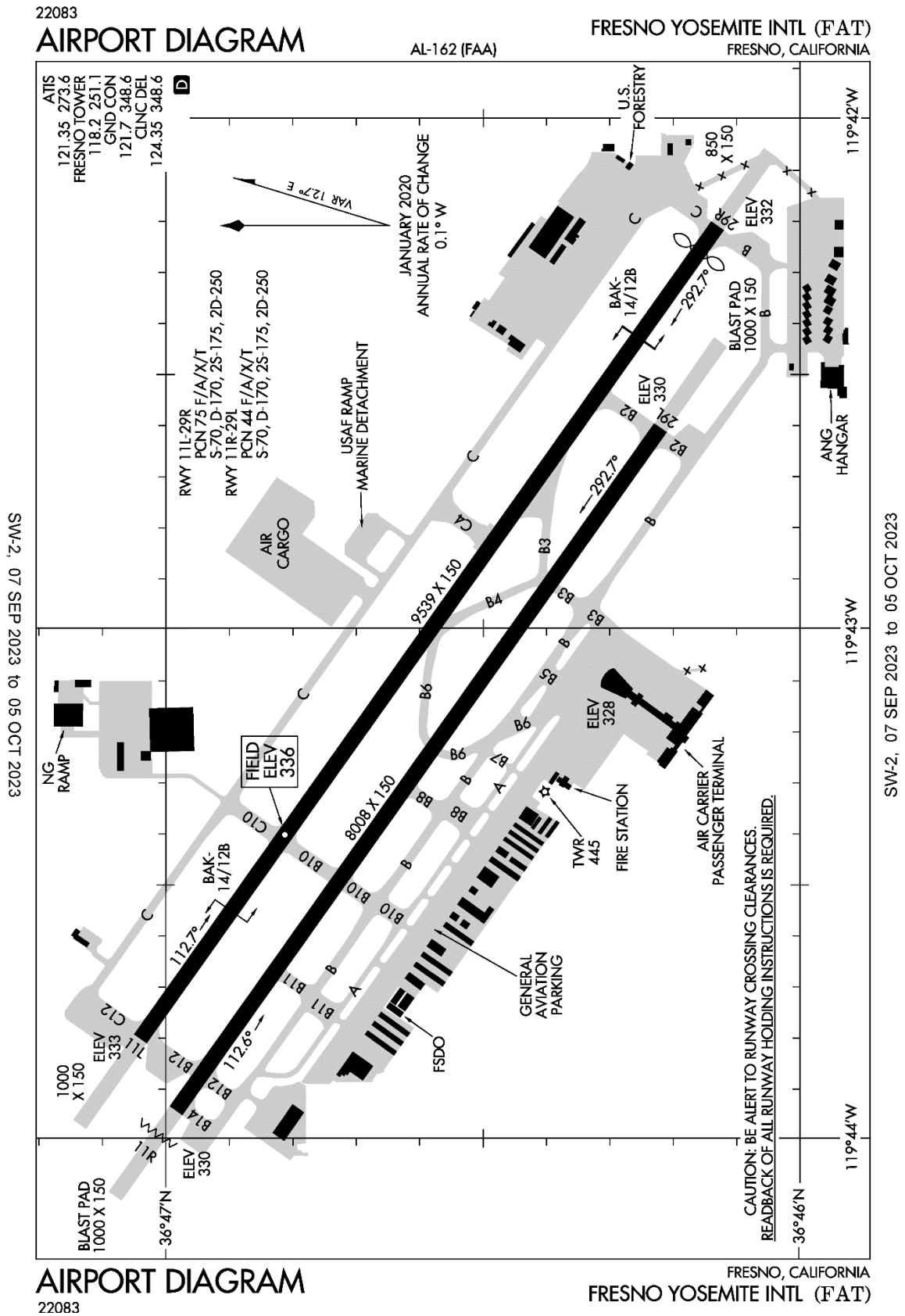

Figure 2-1 Airport Layout Diagram

Noisemap's ability to account for the effects of sound propagation includes consideration of varying terrain elevation, taken from the U.S. Geological Survey (USGS) National Elevation Dataset (NED), and ground impedance conditions, taken from USGS Hydrography data. In this case, "soft ground" (e.g., grass-covered ground) is modeled with a flow resistivity of 225 kilopascal-seconds per square meter (kPa-s/m^2) and "hard ground" (in this case, water) is modeled with a flow resistivity of 100,000 kPa-s/m^2. For ambient temperature, humidity, and pressure, each month was assigned a temperature, relative humidity, and barometric pressure from data available for that month for the years 2015 through 2020. Noisemap then determined and used the month with the weather values that produced the median results in terms of noise propagation effect, which in this case was the month of April (with the values noted in Table 2-1). AEDT weather utilized the standard conditions for the software.

Modeling of civilian aircraft noise, using the AEDT software program, had already been completed in a prior NEM update projecting operations for 2022 using the FAA's AEDT software for civil operations (HMMH 2017). The results of the DoD's Noisemap and FAA's AEDT modeling were combined for all aircraft activity at the airport for both existing and proposed future conditions. The combined noise exposure is presented in terms of contours, i.e., which are lines of equal CNEL value. CNEL contours of 65 to 85 dB, presented in 5-dB increments, provide a graphical depiction of the aircraft noise environment in the vicinity of the airfield.

In addition to the CNEL plots, specific noise sensitive locations (schools, hospitals, places of worship, and residential neighborhoods) have been identified in the surrounding communities referred to as representative Points of Interest (POIs). Census tract centroids (the geometric center of each census tract area) provided additional POIs and the locations most likely to contain nearby noise sensitive land uses (i.e., residential, daycare, places of worship, nursing homes, etc.). The final POI screening involved analyzing the areas surrounding each airfield and primary flight paths to identify noise sensitive locations most likely to experience elevated aircraft noise that were not already captured by other nearby POIs. All supplemental metric analyses are analyzed at all POIs regardless of type because many noise sensitive uses are located nearby. For instance, residential areas often surround schools, so calculating the potential for sleep disturbance at school provides impacts applicable to the neighborhoods that surround each school. Table 2-3 lists and Figure 2-2 presents the 59 selected representative POIs used for this study with census tracts. Section 2.2 provides a discussion on the supplemental metric noise calculations performed for each POI.

Table 2-3 POIs in the Vicinity of FAT

Map ID	*Point Type*	*Named POI*[1]
FR-C-01	Census Tract Centroid	Census Tract 45.03
FR-C-02	Census Tract Centroid	Census Tract 54.10
FR-C-03	Census Tract Centroid	Census Tract 54.03
FR-C-04	Census Tract Centroid	Census Tract 56.08
FR-C-05	Census Tract Centroid	Census Tract 53.02
FR-C-06	Census Tract Centroid	Census Tract 53.04
FR-C-07	Census Tract Centroid	Census Tract 31.02
FR-C-08	Census Tract Centroid	Census Tract 53.01
FR-C-09	Census Tract Centroid	Census Tract 53.05
FR-C-10	Census Tract Centroid	Census Tract 31.03
FR-C-11	Census Tract Centroid	Census Tract 52.04
FR-C-12	Census Tract Centroid	Census Tract 52.02
FR-C-13	Census Tract Centroid	Census Tract 52.03

Map ID	*Point Type*	*Named POI*[1]
FR-C-14	Census Tract Centroid	Census Tract 31.04
FR-C-15	Census Tract Centroid	Census Tract 58.04
FR-C-16	Census Tract Centroid	Census Tract 33.01
FR-C-17	Census Tract Centroid	Census Tract 32.01
FR-C-18	Census Tract Centroid	Census Tract 33.02
FR-C-19	Census Tract Centroid	Census Tract 32.02
FR-C-20	Census Tract Centroid	Census Tract 28
FR-C-21	Census Tract Centroid	Census Tract 29.06
FR-C-22	Census Tract Centroid	Census Tract 30.01
FR-C-23	Census Tract Centroid	Census Tract 58.05
FR-C-24	Census Tract Centroid	Census Tract 29.05
FR-C-25	Census Tract Centroid	Census Tract 29.04
FR-C-26	Census Tract Centroid	Census Tract 30.04
FR-C-27	Census Tract Centroid	Census Tract 30.03
FR-C-28	Census Tract Centroid	Census Tract 14.11
FR-C-29	Census Tract Centroid	Census Tract 14.12
FR-C-30	Census Tract Centroid	Census Tract 59.04
FR-H-01	Healthcare Facility	Fresno VA Medical Center
FR-H-02	Healthcare Facility	Care Facilities Network
FR-R-01	Residential Area	E. Gettysburg Avenue and N. Rowell Avenue
FR-R-02	Residential Area	E. Simpson Avenue and N. Winery Avenue
FR-R-03	Residential Area	E. Madison Avenue and N. Renn Avenue
FR-S-01	School	Fresno Regional Occupational Program, Tioga Middle, and Wolter
FR-S-02	School	University High and California State
FR-S-03	School	Truth Tabernacle Christian School
FR-S-04	School	Thomas Elementary
FR-S-05	School	Vinland Elementary
FR-S-06	School	College Community (Educational Opportunity Center)
FR-S-07	School	Tarpey Elementary
FR-S-08	School	Maverick Prep Private School for Gif
FR-S-09	School	Viking Elementary and Unified School District-Viking Childcare
FR-S-10	School	Miramonte Elementary
FR-S-11	School	Carter G. Woodson Public Charter and Learn Academy
FR-S-12	School	Centennial Elementary, Dakota Circle (Economic Opportunities Commission), and Erma Duncan Polytechnical High
FR-S-13	School	Irwin O. Addicott Elementary Scandinavian Middle
FR-S-14	School	Roger S. Oraze Elementary
FR-S-15	School	McLane High
FR-S-16	School	Cup Large Day Care Center
FR-S-17	School	Ericson Elementary
FR-S-18	School	Sierra Charter and Violet Heintz Education Academy
FR-S-19	School	Virginia R. Boris Elementary
FR-S-20	School	Ewing Elementary and Remnant Christian School
FR-S-21	School	Fresno Adventist Academy
FR-S-22	School	Temperance-Kutner Elementary
FR-S-23	School	Molly S. Bakman Elementary and Turner Elementary
FR-S-24	School	Fancher Creek Elementary

Notes: [1]The census tracts represent neighborhoods surrounding FAT where noise sensitive locations (such as residences, schools, places of worship, etc. are likely to occur).

Legend: FAT = Fresno Yosemite International Airport; ID = Identification; POI = Point of Interest.

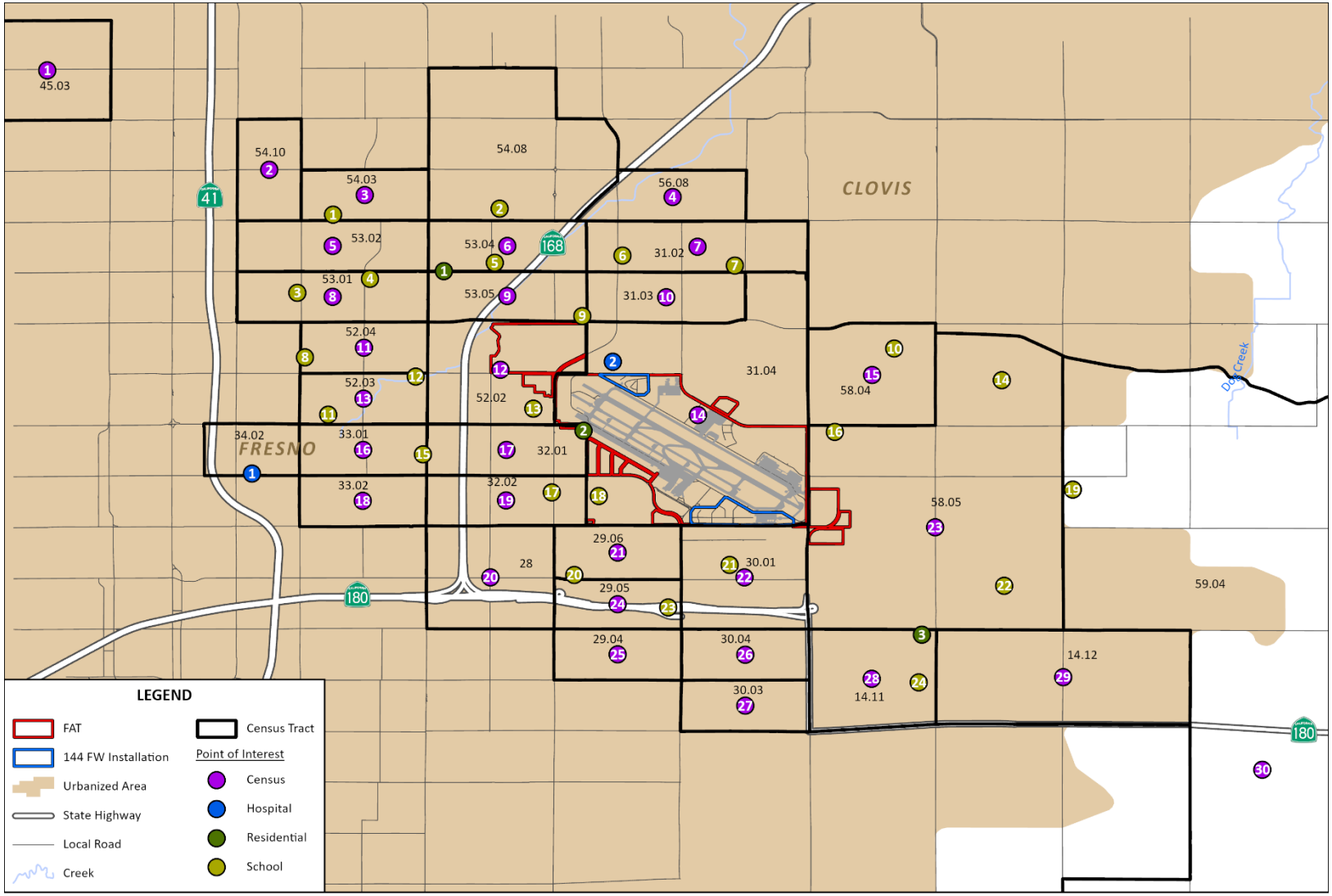

Figure 2-2 Representative POIs and Census Tracts in the Vicinity of FAT

2.1.2 Special Use Airspace

In the SUA environment, the Onset-Rate Adjusted Monthly Community Noise Equivalent Level ($CNEL_{mr}$) serves as the primary noise metric, with predicted sound levels based on the month with the most aircraft activity in each airspace unit to account for the sporadic nature of operations. Under DWNG guidance, $CNEL_{mr}$ is the California equivalent version of Onset-Rate Adjusted Monthly Day-Night Average A-weighted Sound Level (L_{dnmr}) that the U.S. Government standard recommends for modeling and predicting the cumulative noise exposure and assessing community noise impacts in the SUA environment. $CNEL_{mr}$ is identical to the CNEL except that an additional weighting is applied to account for the startle effect due to the quick increase in sound level created by aircraft operating at low altitudes and high rates of speed (over 400 knots). The weighting is based on how quickly the sound increases when heard by an observer on the ground, described as 'rise-time' rate, and ranges for 0 to up to 11 dB. Thus, CNEL will always be equal to or lower than L_{dnmr} but CNEL is also presented for FAA impact consideration under FAA Order 1050.1F.

If there are large variations in the distribution of airspace utilization from one month to the next, then $CNEL_{mr}$ would be based upon the month with the most aircraft activity in each airspace unit to account for the sporadic nature of operations. However, the airspace training considered in this study for the existing F-15C and proposed F-15EX and F-35A remains relatively consistent, so an average month of training forms the basis for the airspace noise analysis. Noise modeling in the airspace was accomplished by identifying the overland airspace unit nearest noise sensitive receptors and assuming a 'worst-case' scenario with all ANG training events occurring within that airspace with typical airspace profiles appropriate for each aircraft type. This approach provides a conservative estimate of the greatest $CNEL_{mr}$ that could occur within the SUA. $CNEL_{mr}$ for a typical year would be less because a portion of training would occur in over-water training airspace where there would be no noise impacts to humans. The rise-time weighting applicable to $CNEL_{mr}$ results in calculated $CNEL_{mr}$ that will always be equal to or greater than CNEL for the same activity.

Using the MRNMap model contained in the Noisemap software suite, noise modeling requires determining the use of each airspace unit and building each aircraft's flight profiles based on the aircraft's configuration (airspeed and power setting) and the amount of time spent at various altitudes throughout the airspace. With variation in the utilization of airspace by the 144 FW, this analysis conservatively assumed all 144 FW activity occurs in the over-land airspace where noise impacts to humans would be greatest, for all scenarios. The modeling details for airspace operation within the over-land airspace (altitude distributions, speeds, and power settings) was developed iteratively with a team primarily made up of representatives from FAT, the 144 FW, as well representatives from the NGB. The data were compiled in a validation package that was reviewed by and approved for use FAT, 144 FW, and NGB team prior to modeling (NGB 2022). The ambient temperature, humidity, and pressure were assumed the same as at the airfield (see Table 2-1).

The software program, BOOMAP96, provides a method to estimate CDNL generated by supersonic flight operations in SUA. CDNL predicted from the BOOMAP96 software relies upon measured noise levels collected at ground level during Basic Flight Maneuvers within airspace with no minimum supersonic altitude restrictions. The airspace considered in this analysis imposes a minimum altitude of 10,000 feet mean sea level (MSL) for supersonic activity. Because BOOMAP96 does not provide user adjustment for minimum supersonic altitudes, the software predicted CDNL would be greater than the actual levels that

would occur within airspace with altitude restrictions. Therefore, this study utilizes BOOMAP96 to calculate the relative change that would occur under each proposed action relative to the existing conditions.

2.2 ADDITIONAL (SUPPLEMENTAL) NOISE METRICS

While a cumulative metric, such as CNEL is appropriate to predict the overall noise environment at airfields (and the airspace equivalent [$CNEL_{mr}$] in the vicinity of SUA), a full description of noise impacts to noise sensitive locations requires additional metrics. The DoD expands upon CNEL with the following supplemental metrics described in the DNWG guidelines (DNWG 2009a):

- A measure of the greatest sound level generated by single aircraft events: Maximum Sound Level (L_{max}),
- A combination of the sound level and duration: Sound Exposure Level (SEL), and
- Number of Events at or above a specified threshold (NA),
- Equivalent Sound Level (L_{eq}),
- Time Above a specified level (TA), and
- Probability of Awakening (PA).

NA, TA, and L_{eq} use a specified period of time that can include an average 24-hour day, CNEL daytime, CNEL nighttime, school day, or other time period appropriate for the analysis. Details on the use of these supplemental metrics in this study are described in the following sections.

2.2.1 Maximum Sound Level

The highest A-weighted sound level measured during a single event in which the sound changes with time is called the maximum A-weighted sound level or L_{max}. L_{max} is the maximum level that occurs over one-eighth of a second and denoted as "fast" response on a sound level meter (American National Standards Institute [ANSI] 1988). L_{max} is used in this study for the calculation of numbers of events above, as described in Section 2.2.5 and 2.2.6, and to compare single-event noise levels between different aircraft types in Section 4.2.2. Although useful in determining when a noise event may interfere with conversation, TV or radio listening, or other common activities, L_{max} does not fully describe the noise because it does not account for how long the sound is heard.

2.2.2 Sound Exposure Level

SEL combines both the intensity of a sound and its duration by providing the sound level that would contain the same sound energy of an event if occurring over a 1 second period. This means that SEL does not represent a sound level that is heard directly at any given time. However, SEL provides a much better metric for comparison of aircraft flyovers than L_{max} because it allows normalization of disparate events to their 1 second energy average. SEL values are larger than those for L_{max} for the same event because aircraft noise events last more than a few seconds. Section 4.2.2 provides single-event SEL comparisons across different aircraft while operating in the airspace.

2.2.3 Equivalent Sound Level

The L_{eq} is a "cumulative" metric that combines a series of noise events over a period of time by averaging the sound energy. The time period specified for L_{eq} is typically provided along with the value and relates

to a type of activity and presented in parenthesis (e.g., $L_{eq(24)}$ for 24 hours). An $L_{eq(8)}$ is used in this study to represent a typical school day occurring from 7 a.m. (0700) to 3 p.m. (1500).

2.2.4 Potential for Hearing Loss

People exposed to high noise environments over a long period of time are at an increased risk of experiencing permanent hearing loss. Hearing loss is generally interpreted as a decrease in the ear's sensitivity to perceived sound, which can be either temporary or permanent. Various governmental organizations, including the Occupational Safety and Health Administration, have identified noise thresholds varying from 70 to 85 dB L_{eq} to protect workers with the exposure assumption of 40 hours per week over a 40-year work lifetime.

Exposure to noise for people residing in areas adjacent to airfields is quite different from a work environment. When people are indoors, the sound levels experienced decrease due to building attenuation. Additionally, when people spend time away from home, the exposure to noise from the airfield in question is removed so the Occupational Safety and Health Administration standards would tend to overpredict the hearing loss risk. By definition, CNEL is equal to or greater than L_{eq}, so the DoD selected a screening threshold of 80 dB CNEL of residences to ensure a conservative approach to assessing the potential for hearing loss (DNWG 2012). If residences are identified within the 80 dB CNEL, or greater, additional analysis of L_{eq} should be performed.

2.2.5 Non-School Speech Interference

Aircraft noise events can disrupt activities like conversation or watching television when indoor L_{max} exceeds 50 dB because word intelligibility decreases at that level (DNWG 2013a). This study determines the number of potential speech interfering events at non-school POIs (such as residential or hospital) during a 15-hour day (from 7 a.m. [0700] until 10 p.m. [2200]) and presents the average hourly number of events as numbers of events above (NA).

2.2.6 Classroom Learning Interference

A noisy environment can adversely affect and interfere with classroom learning. Various governmental organizations have identified both L_{eq} and number of interfering events as suitable criteria for classroom impacts. Consistent with DoD recommendations, this study used an exterior L_{eq} of 60 dB (equivalent to 45 dB interior L_{eq} with windows open) as a screening criteria to determine schools at risk of classroom learning affects (DNWG 2009a). Locations that exceed this threshold have been further analyzed by counting the number of events per hour above an interior L_{max} of 50 dB, which equates to the highest permissible classroom level for speech intelligibility. The standard noise level reduction due to building attenuation of 15 dB for windows open and 25 dB for windows closed have been utilized to convert between exterior and interior sound levels. The duration, in minutes, that interior sound levels would exceed 50 dB has also been computed to provide an assessment of the relative time per day that students and teachers may be impacted.

2.2.7 Residential Sleep Disturbance

2.2.7.1 Background

Sleep disturbance can be caused by excessive noise, which can hinder people's ability to fall asleep or to cause people to wake from sleep. A method for calculation of the PA from at least one event per night is described in ANSI/Acoustical Society of America (ASA) S12.9-2008/Part 6. The standard utilizes the estimated interior SEL caused by aircraft events along with the number of occurrences per night to calculate the PA from that event. The resulting PA estimates the percentage of the population that would be awakened at least once per night under the noise conditions assessed. For instance, 1 percent PA estimates that 1 percent of the population would be awakened. Multiple events can be combined to determine the PA for all events during a single night. ANSI recommends that only nighttime events occurring during the CNEL nighttime with SELs between 50 and 100 dB should be used for this PA calculation. Data suggests that events below 50 dB do not contribute significantly to PA and the formula under-predicts PA for events over 100 dB. The DNWG for environmental impact analysis has endorsed this ANSI/ASA 2008 methodology (DNWG 2009b).

In addition to the ANSI/ASA 2008 methodology, the DNWG guidance identifies outdoor numbers of events (commonly abbreviated as NA) above an SEL of 90 dB as an additional criteria for sleep disturbance analysis:

> *Currently, there are no established criteria for evaluating sleep disturbance from aircraft noise, although recent studies have suggested a benchmark of an outdoor SEL of 90 dB as an appropriate tentative criterion when comparing the effects of different operational alternatives. The corresponding indoor SEL would be approximately 25 dB lower (at 65 dB) with doors and windows closed, and approximately 15 dB lower (at 75 dB) with doors or windows open.*

As described in DNWG (2009b), comparison of exterior number of events above 90 dB SEL across multiple study scenarios allows for sleep disturbance impacts to be considered. This does make use of the same PA formula identified in ANSI/ASA 2008 but groups all events as either equal to 90 dB exterior SEL or below the threshold for consideration.

As of July 2018, the ANSI and ASA have withdrawn the 2008 standard, which formed the basis of much of the DNWG 2009b guidance:

> *The decision of Working Group S12/WG 15 to withdraw ANSI/ASA S12.9-2008/Part 6 implies that the method for calculating "at least one behavioral awakening per night" contained in the former Standard should no longer be relied upon for environmental impact assessment purposes. The Working Group believes that continued reliance on the 2008 Standard would lead to unreliable and difficult-to-interpret predictions of transportation-noise-induced sleep disturbance. (ANSI/ASA 2018)*

Without a reliable and standardized method to compute PA, or updated guidance from DNWG, this study presents the sleep impact analysis utilizing the previous standard (ANSI/ASA 2008; DNWG 2009b) for environmental impact disclosure purposes. The reader is cautioned that the PA metric provides only a crude estimate because it cannot truly account for all variables that could affect a person's sleep. A comparison of the existing conditions and various Proposed Action scenario awakening percentages showing large

changes to PA could provide some insight on whether a particular action would be likely to increase or decrease sleep impacts. However, any additional conclusions may not be supportable.

3.0 EXISTING CONDITIONS

The following subsections detail the modeling data and the resultant noise exposure for the existing conditions at the airfield as well as within the SUA associated with 144 FW operations.

3.1 INSTALLATION/AIRPORT

3.1.1 Modeling Data

3.1.1.1 Based F-15C

Existing 144 FW flight operations for Fiscal Year (FY) 2021 consisted of the following:

- 2,912.5 hours flown
- 1,811 sorties
- 1.6-hour Average Sortie Duration

Although much of the flying by the 144 FW occurs at their home location at FAT, nearly every year for a couple of weeks to several months annually, the 144 FW aircraft will leave FAT to train with other units at different airfields resulting in fewer flying operations at FAT than the 1,811 sorties from FY 2021. For the purposes of impact analysis, all modeled scenarios consider the potential for the greatest potential impact or the 'worst' case (that is, if all flying activity were to occur at FAT during the year). Although the 144 FW's aging F-15C aircraft face maintenance issues, the existing conditions assume the aircraft would continue to be maintained sufficiently to be flown at a similar rate as recent years with an average of 1,811 sorties per year.

As summarized in Table 3-1, each sortie generates a departure and an arrival flight operation, all of which are assumed to occur at FAT for analysis. Additionally, the 144 FW conducts check flights where a closed pattern flight track is flown within the local airspace approximately three times per week. The 144 FW estimated a total of 90 closed pattern check flights flown at FAT annually. Because each closed pattern flight generates a departure and an arrival, the 90 check flights amount to 180 annual operations. The resulting total 144 FW airfield operations are estimated at 3,802 per year. Details on the development of the modeled operations for other aircraft (C-26, Army Guard Helicopters, and civil operations) are described in Sections 3.1.1.2 and 3.1.1.3.

The day and night periods referenced in Table 3-1 refer to specific 'acoustic periods' applicable to the CNEL metric used for airfield noise impact analysis and correspond to 7 a.m. to 7 p.m. (0700 to 1900) for daytime, 7 p.m. to 10 p.m. (1900 to 2200) for evening, and 10 p.m. to 7 a.m. (2200 to 0700) for nighttime.

Table 3-1 Current Average Annual Operations at FAT

Group	*Aircraft*[3]	*Departures*			*Arrivals*			*Closed Patterns*[1]			*Total*			
		Day	*Eve*	*Night*	*Day*	*Eve*	*Night*	*Day*	*Eve*	*Night*	*Day*	*Eve*	*Night*	*Total*
144 FW	F-15C	1,668	141	2	1,668	74	69	166	14	0	3,502	229	71	3,802
144 FW	C-26[2]	150	8	2	145	10	5	0	0	0	295	18	7	320
Army Guard	UH-60	423	30	12	419	33	13	270	20	10	1,112	83	35	1,230
Army Guard	CH-47	142	10	3	140	11	4	90	7	3	372	28	10	410
Military	*Military Total*	*2,383*	*189*	*19*	*2,372*	*128*	*91*	*526*	*41*	*13*	*5,281*	*358*	*123*	*5,762*
Civil	Jet Airliner	21,112	7,121	2,989	17,025	7,328	6,925	0	0	0	38,137	14,449	9,914	62,500
Civil	Business jet	223	60	8	191	69	27	0	0	0	414	129	35	578
Civil	Piston Propeller (single or double)	3,649	768	135	3,267	999	283	0	0	0	6,916	1,767	418	9,101
Civil	Helicopter	2,347	1,193	576	1,359	1,648	1,110	0	0	0	3,706	2,841	1,686	8,233
Civil	*Civil Total*	*27,331*	*9,142*	*3,708*	*21,842*	*10,044*	*8,345*	*0*	*0*	*0*	*49,173*	*19,186*	*12,053*	*80,412*
Grand Total		29,714	9,331	3,727	24,214	10,172	8,436	526	41	13	54,454	19,544	12,176	86,174

Note: [1]Closed Patterns counted as two operations.
[2]Modeled as Hawker Siddeley HS748 (BAE-HS-748).
[3]Detail list of civil aircraft modeled with grouping and aircraft ID provided in Appendix A.
Legend: 144 FW = 144th Fighter Wing; FAT = Fresno Yosemite International Airport.

3.1.1.2 Other Based Military

In addition to the F-15C, the 144 FW operates a C-26, used primarily for law enforcement missions, often supporting local or federal agencies performing approximately three sorties per week. The C-26 also provides fire boundary mapping during fire season on an as-needed basis where they will typically fly every day for several weeks each year. No closed patterns are flown at FAT. Table 3-1 details the resulting annual operations by the C-26, totaling 320 per year, which apply to all modeled scenarios in this analysis. Because noise data for the C-26 is not available within the noise database, the C-26 operations were modeled as Hawker Siddeley HS 748 (BAE-HS-748), which is also twin turboprop engine but with larger power and weight capacity that provides a conservative noise estimate.

The California Army National Guard Aviation Classification Repair Activity Depot provides extensive maintenance and repair activity for operating Army UH-60 and CH-47 Helicopters. Army Guard helicopter operations are split approximately 75 percent UH-60 and 25 percent CH-47, both performing departures and arrivals from FAT runways, closed patterns at Charley Taxiway, and airspace flight in the nearby military training area. Helicopter flights include performing local closed patterns to the taxiway and flight in the nearby Military Training Area. As detailed in Table 3-1, the Army Guard typically conducts 1,640 annual operations at FAT.

3.1.1.3 Transient Military and Civil

This section describes the transient military and civilian operations that would apply to all modeled scenarios unaffected by the Proposed Action scenarios. The 2017 NEM Update, completed per 14 CFR Part 150, represents the most recent noise analysis at FAT and presented both a forecasted 2017 and 2022 year analysis (HMMH 2017). The 2017 scenario included 108,880 annual operations while 2022 included a total of 112,656 annual operations, as listed in Table 3-2. The 'Cargo and Military' category contained 9,083 operations for both modeled years.

Table 3-2 Part 150 Study Summary of 2017 and 2022 Forecasted Annual Operations at FAT

Category	*2017*	*2022*	*Average Annual Growth Rate*
Cargo and Military	9,083	9,083	0.0%
Commercial Air Carrier	31,571	34,010	1.5%
GA Jet	3,635	3,714	0.4%
GA Single/Multi-engine Piston	49,123	49,487	0.1%
GA Turboprop and Rotorcraft	15,468	16,362	1.1%
Total	108,880	112,656	0.7%

Legend: % = percent; GA = General Aviation; FAT = Fresno Yosemite International Airport.
Source: FAT 2017.

Between the publishing of the 2017 NEM update and the writing of this noise study, U.S. commercial air carriers' total number of domestic departures in 2020 declined almost 30 percent from the prior year due to COVID-19. Domestic mainline enplanement forecast to drop further in 2021 before beginning a recovery in 2022. The two subsequent years, 2023 and 2024, expect to see strong rates of growth and domestic mainline enplanements estimated to return to 2019 levels in early 2024. International mainline

enplanements are projected to follow a similar path with strong growth early in the recovery that slows as enplanements return to 2019 levels in 2025."[1]

The FAA's Performance Data Analysis and Reporting System (PDARS) has collected more recent aircraft operations at FAT since the 2017 NEM update and includes years affected by COVID-19. Table 3-3 presents operations by type and aircraft for 2019. Unfortunately, most of the operations in this data set lack either aircraft or operation type identification that would be useful for noise modeling but the total of approximately 90,000 operations provides insight into current activity at FAT. Another FAA system, the Operations Network (OPSNET) tabulates operations by aircraft category and differentiates between military and civil types, as summarized in Table 3-4 for calendar years 2017 through 2021. Contrary to the 2017 NEM projections of increasing annual operations at FAT, both PDARS and OPSNET historical data now reflects decreases in operations to approximately 85,000 in 2017 and 2018. Operations in 2020 further decreased significantly to their lowest in many years due primarily to COVID-19 and recovered partially in 2021. By excluding the COVID-19 affected 2020 and 2021 years, a 3-year average of operations between 2017 through 2019 can be calculated to represent a near future forecast for 2023 and several years beyond consistent with the proposed NGB basing action at FAT that would begin in 2025. Civil aircraft noise modeling were scaled from the 2017 NEM forecasted 2022 scenario, by aircraft category, to this 3-year average and modeled with the AEDT software.

Table 3-3 2019 PDARS Operation Counts at FAT

Aircraft Type	*Arrivals*	*Departures*	*Overflights*	*Unknown Operation Type*	*All Operations*
Known	6,824	6,145	2,168	0	15,137
Unknown	19,200	20,197	149	35,992	75,538
Total	26,024	26,342	2,317	35,992	90,675

Legend: FAT = Fresno Yosemite International Airport; PDARS = Performance Data Analysis and Reporting System.

Table 3-4 FAA OPSNET Historical Operations at FAT

Group	*Aircraft*	*Category*	*2017*	*2018*	*2019*	*2020*	*2021*	*3-Year Average (2017–2019)*
Military	Based	Based Total	1,804	1,391	2,002	1,756	1,776	1,732
Military	Transient	Transient Total	5,915	5,291	4,845	5,601	5,239	5,350
Military		**Total**	**7,719**	**6,682**	**6,847**	**7,357**	**7,015**	**7,083**
Civil	Based	Local Civil Total	8,433	9,482	11,700	8,958	10,283	9,872
Civil	Transient	*Air Carrier*	*17,540*	*18,930*	*20,882*	*14,688*	*22,271*	*19,117*
Civil	Transient	*Air Taxi*	*15,085*	*12,954*	*12,167*	*8,101*	*9,632*	*13,402*
Civil	Transient	*General Aviation*	*36,814*	*37,592*	*39,655*	*30,159*	*35,867*	*38,020*
Civil	Transient	Transient Total	69,439	69,476	72,704	52,948	67,770	70,540
Civil		**Total**	**77,872**	**78,958**	**84,404**	**61,906**	**78,053**	**80,411**
Grand Total			**85,591**	**85,640**	**91,251**	**69,263**	**85,068**	**87,494**

Legend: FAA = Federal Aviation Administration; FAT = Fresno Yosemite International Airport; OPSNET = Operations Network.

[1] Federal Aviation Administration (FAA). 2021. Federal Aviation Administration Aerospace Forecast Fiscal Years 2021–2041.

Because overall transient military aircraft operations have remained more constant throughout this time period with military operations were largely unaffected by COVID-19, these operations are expected to remain similar into the near future. For all aircraft operating at FAT, Table 3-5 includes the time-of-day runway and helipad utilization, and Table 3-6 depicts the time-of-day runway and helipad heading utilization. Appendix A includes detailed military and civilian flight tracks grouped by type of operation, aircraft ID, FAA tower category, engine type, and flight track utilization at FAT. The FAT airport manager and FAA air traffic controllers confirmed that the data presented within the Part 150 NEM 2022 scenario represents the best available data with regards to the following parameters: (1) operations frequency; (2) time-of-day operations; (3) fleet-mix; (4) runway/helipad distribution and utilization; and (5) flight track locations.

Figure 3-1 represents the modeled static run-up profile locations. Consistent with the flight operations, maintenance run-up activities were modeled on an AAD basis. Table 3-7 presents the static run-up operations profiles for based military aircraft at FAT. No additional civil static run-ups were modeled in this case.

3.1.2 Noise Exposure

Sections 3.1.2.1 through 3.1.2.6 focus on DoD best practices for impact analysis, as summarized in DNWG guidance (DNWG 2009a). The existing CNEL contours, CNEL at noise sensitive locations (the FAA terminology corresponding generally to DoD POIs), acreage, population, and household affected by CNEL also apply to FAA.

3.1.2.1 Community Noise Equivalent Level Contours and Points of Interest Levels

Figure 3-2 shows the CNEL noise contours from 65 to 85 dB in 5-dB increments for the existing conditions at FAT. Noise generated from aircraft operations at FAT occurs within and outside of the airfield. Portions of the 65 dB CNEL contour extend beyond FAT to the northwest by 0.2 mile, to the northeast up to 0.3 mile, southeast 0.1 mile, and southwest approximately 0.1 mile.

Table 3-8 shows the CNEL values at each of the POIs under the existing conditions. Values range from 43 to 69 dB CNEL. Under existing conditions, a total of 4 POIs experience CNEL of 65 or greater, the threshold where land use restrictions are recommended for noise sensitive uses. None of those POIs experience 70 dB CNEL or greater noise levels.

3.1.2.2 Acreage, Housing, and Population

Table 3-9 shows the acreage (excluding water bodies) by noise contour band resulting in a total of 176 off-airport acres at FAT exposed to 65 dB CNEL or greater for existing conditions. That off-airport acreage is comprised of 161 acres exposed to 65 to 70 dB CNEL, 15 acres to 70 to 75 dB CNEL, and no acres exposed to 75 dB CNEL or greater.

Table 3-5 Time of Day Runway Directional Use

Aircraft Category	*Sub-category*	*Aircraft Modeled*	*Runway Pair*	*Arrival*			*Departure*			*Closed Pattern*		
				Day	*Evening*	*Night*	*Day*	*Evening*	*Night*	*Day*	*Evening*	*Night*
Civilian	All Fixed-Wing	Various	11L/29R	61%	75%	77%	48%	43%	69%			
			11R/29L	39%	25%	23%	52%	57%	31%			
Military Based	144 FW	F-15E PW220	11L/29R	96%	96%	96%	95%	95%	95%	100%	100%	
			11R/29L	4%	4%	4%	5%	5%	5%			
		C-26	11L/29R	95%	95%	95%	95%	95%	95%	N/A	N/A	N/A
			11R/29L	5%	5%	5%	5%	5%	5%	N/A	N/A	N/A
	ARNG	UH-60A	H1/H5	20%	20%	20%						
			H11/H29	80%	80%	80%	100%	100%	100%	100%	100%	100%
		CH-47C	H1/H5	20%	20%	20%						
			H11/H29	80%	80%	80%	100%	100%	100%	100%	100%	100%
Military Transients	Military Jets	F-15E, F-16, F-18E/F	11L/29R	96%	96%	96%	95%	95%	95%	100%	100%	
			11R/29L	4%	4%	4%	5%	5%	5%			
	Military Transport	C-130	11L/29R	95%	95%	95%	95%	95%	95%	N/A	N/A	N/A
			11R/29L	5%	5%	5%	5%	5%	5%	N/A	N/A	N/A

Legend: % = percent; 144 FW = 144th Fighter Wing; ARNG = Army National Guard.

Table 3-6 Time of Day Runway and Helipad Heading Utilization

Aircraft Category	*Sub-category*	*Aircraft modeled*	*Runway Pair*	*Arrival*			*Departure*			*Closed Pattern*		
				Day	*Evening*	*Night*	*Day*	*Evening*	*Night*	*Day*	*Evening*	*Night*
Civilian	All Fixed-Wing	Various	11L	8%	3%	2%	3%	1%	1%	3%	1%	1%
			11R	6%	1%	1%	10%	3%	3%	10%	3%	3%
			29L	34%	24%	22%	42%	54%	28%	42%	54%	28%
			29R	53%	73%	76%	45%	42%	68%	45%	42%	68%
Military Based	144 FW	F-15E PW220	11L	14%	14%	14%	14%	14%	14%	10%	10%	
			11R	1%	1%	1%	1%	1%	1%			
			29L	3%	3%	3%	4%	4%	4%			
			29R	82%	82%	82%	81%	81%	81%	90%	90%	
	144 FW	C-26	11L	14%	14%	14%	14%	14%	14%			
			11R	1%	1%	1%	1%	1%	1%			
			29L	4%	4%	4%	4%	4%	4%			
			29R	81%	81%	81%	81%	81%	81%			
	ARNG	UH-60A	H1	10%	10%	10%						
			H5	10%	10%	10%						
			H11				30%	30%	30%	15%	15%	15%
			H29	80%	80%	80%	70%	70%	70%	85%	85%	85%
	ARNG	CH-47C	H1	10%	10%	10%						
			H5	10%	10%	10%						
			H11				70%	70%	70%	15%	15%	15%
			H29	80%	80%	80%	30%	30%	30%	85%	85%	85%
Military Transient												

Note: Numbers may not add to 100% due to rounding.
Legend: % = percent; 144 FW = 144th Fighter Wing; ARNG = Army National Guard.

Figure 3-1 Modeled Static Run-Up Locations at FAT

Table 3-7 Ground and Maintenance Engine Operations for Based Military Aircraft at FAT

Aircraft	*Description*	*Pad*	*Heading (deg)*	*Power (%NC)*	*Num Engines*	*Duration*	*Annual Events*	*Day/Eve/Night Split*[1]
F-15C (modeled with F-15E PW220)[2]	Ground Runs	Ramp 1, 50% of events Ramp 2, 50% of events	Ramp1=150 Ramp2= 20	68% (idle)	1	30 mins	624	90% / 10% / 0%
			Ramp1=150 Ramp2= 20	75%	1	20 secs	24	90% / 10% / 0%
	Arm/ De-Arm	Ramp 1	150	68% (idle)	2	5 mins	200	90% / 10% / 0%
	Arm/ De-Arm	Ramp 2	110	68% (idle)	2	5 mins	200	90% / 10% / 0%
	Hush House Engine Runs	HH	270	63	1	32 mins	12	100% / 0% / 0%
				80	1	13 mins		
				92	1	7 mins		
				63	1	33 mins		
				80	1	13 mins		
				92	1	6 mins		
UH-60	Ground Engine Runs	Ramp	290	Ige Lite	1	20	75	90% / 10% / 0%
UH-72	Ground Engine Runs	Ramp	290	Ige Lite	1	20	25	90% / 10% / 0%

Notes: [1]Day = 7:00 a.m.–10:00 p.m. (0700–2200), Night = 10:00 p.m.–7:00 a.m. (2200–0700).
Legend: % = percent; %NC = percent speed of the compressor.

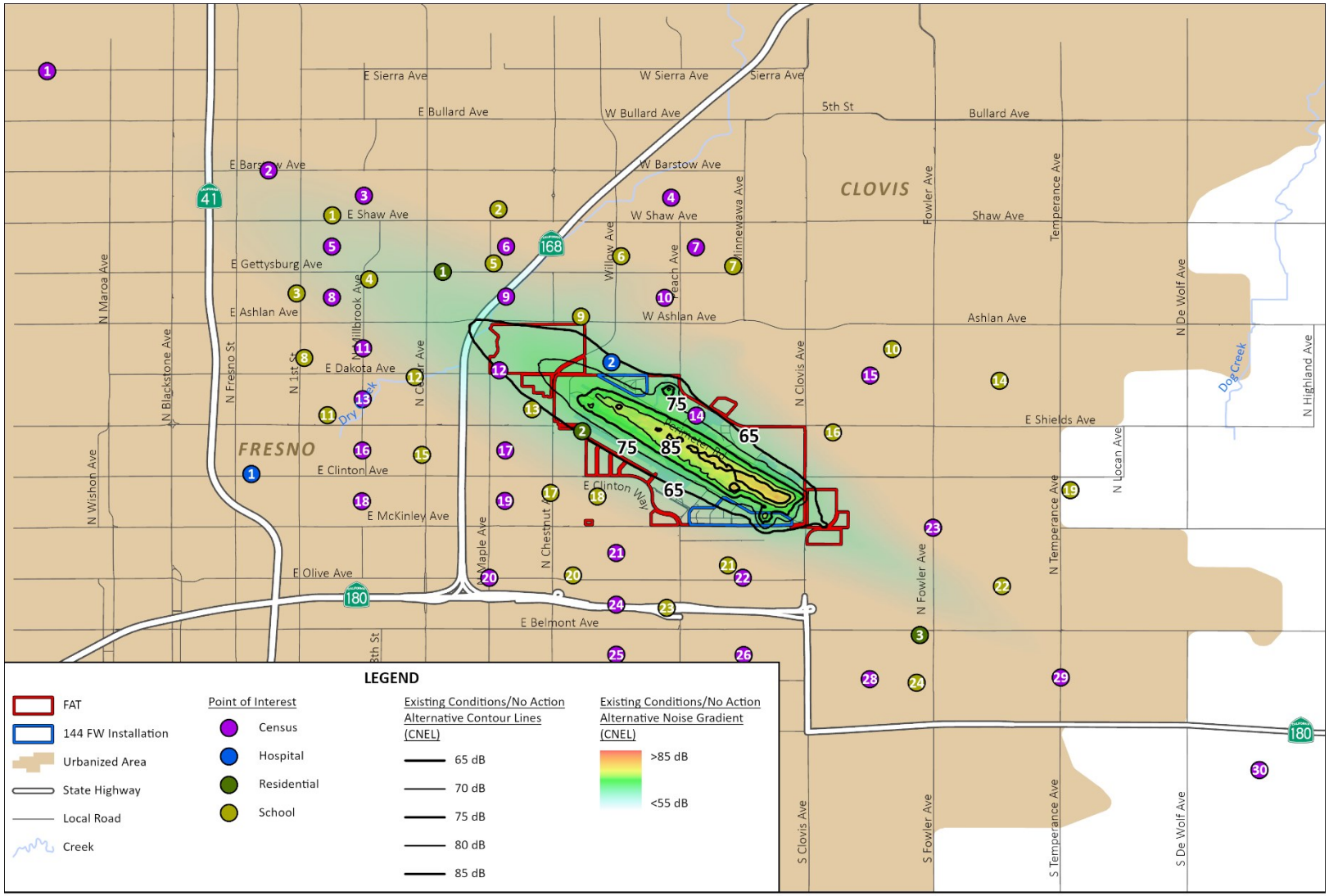

Figure 3-2 Current/Existing Conditions CNEL Contours and Noise Gradient in the Vicinity of FAT

Table 3-8 Current CNEL at POI in the Vicinity of FAT

Map ID	*Point Type*	*Named Point of Interest*[1]	*Current CNEL*[2] *(dB)*
CAFr-C-01	Census Tract Centroid	Census Tract 45.03	52
CAFr-C-02	Census Tract Centroid	Census Tract 54.10	56
CAFr-C-03	Census Tract Centroid	Census Tract 54.03	56
CAFr-C-04	Census Tract Centroid	Census Tract 56.08	48
CAFr-C-05	Census Tract Centroid	Census Tract 53.02	60
CAFr-C-06	Census Tract Centroid	Census Tract 53.04	56
CAFr-C-07	Census Tract Centroid	Census Tract 31.02	52
CAFr-C-08	Census Tract Centroid	Census Tract 53.01	58
CAFr-C-09	Census Tract Centroid	Census Tract 53.05	62
CAFr-C-10	Census Tract Centroid	Census Tract 31.03	56
CAFr-C-11	Census Tract Centroid	Census Tract 52.04	56
CAFr-C-12	Census Tract Centroid	Census Tract 52.02	**65**
CAFr-C-13	Census Tract Centroid	Census Tract 52.03	53
CAFr-C-14	Census Tract Centroid	Census Tract 31.04	**69**
CAFr-C-15	Census Tract Centroid	Census Tract 58.04	50
CAFr-C-16	Census Tract Centroid	Census Tract 33.01	50
CAFr-C-17	Census Tract Centroid	Census Tract 32.01	56
CAFr-C-18	Census Tract Centroid	Census Tract 33.02	48
CAFr-C-19	Census Tract Centroid	Census Tract 32.02	52
CAFr-C-20	Census Tract Centroid	Census Tract 28	46
CAFr-C-21	Census Tract Centroid	Census Tract 29.06	51
CAFr-C-22	Census Tract Centroid	Census Tract 30.01	53
CAFr-C-23	Census Tract Centroid	Census Tract 58.05	54
CAFr-C-24	Census Tract Centroid	Census Tract 29.05	47
CAFr-C-25	Census Tract Centroid	Census Tract 29.04	44
CAFr-C-26	Census Tract Centroid	Census Tract 30.04	47
CAFr-C-27	Census Tract Centroid	Census Tract 30.03	43
CAFr-C-28	Census Tract Centroid	Census Tract 14.11	47
CAFr-C-29	Census Tract Centroid	Census Tract 14.12	54
CAFr-C-30	Census Tract Centroid	Census Tract 59.04	51
CAFr-H-01	Healthcare Facility	Fresno VA Medical Center	46
CAFr-H-02	Healthcare Facility	Care Facilities Network	**66**
CAFr-R-01	Residential Area	E. Gettysburg Avenue and N. Rowell Avenue	61
CAFr-R-02	Residential Area	E. Simpson Avenue and N. Winery Avenue	**66**
CAFr-R-03	Residential Area	E. Madison Avenue and N. Renn Avenue	53
CAFr-S-01	School	Fresno Regional Occupational Program, Tioga Middle, and Wolter	59
CAFr-S-02	School	University High and California State	53
CAFr-S-03	School	Truth Tabernacle Christian School	57
CAFr-S-04	School	Thomas Elementary	61
CAFr-S-05	School	Vinland Elementary	58
CAFr-S-06	School	College Community (Economic Opportunities Commission) Head Start Community College	55
CAFr-S-07	School	Tarpey Elementary	52
CAFr-S-08	School	Maverick Prep Private School for Gifted Dyslexic Students	53
CAFr-S-09	School	Viking Elementary and Fresno Unified School District-Viking Childcare	62
CAFr-S-10	School	Miramonte Elementary	46

Map ID	*Point Type*	*Named Point of Interest*[1]	*Current CNEL*[2] *(dB)*
CAFr-S-11	School	Carter G. Woodson Public Charter and Learn Academy	50
CAFr-S-12	School	Centennial Elementary, Dakota Circle (Economic Opportunities Commission), and Erma Duncan Polytechnical High	57
CAFr-S-13	School	Irwin O. Addicott Elementary Scandinavian Middle	63
CAFr-S-14	School	Roger S. Oraze Elementary	43
CAFr-S-15	School	McLane High	51
CAFr-S-16	School	Cup Large Day Care Center	54
CAFr-S-17	School	Ericson Elementary	54
CAFr-S-18	School	Sierra Charter and Violet Heintz Education Academy	57
CAFr-S-19	School	Virginia R. Boris Elementary	46
CAFr-S-20	School	Ewing Elementary and Remnant Christian School	48
CAFr-S-21	School	Fresno Adventist Academy	54
CAFr-S-22	School	Temperance-Kutner Elementary	54
CAFr-S-23	School	Molly S. Bakman Elementary and Turner Elementary	47
CAFr-S-24	School	Fancher Creek Elementary	49

Notes: [1]The census tracts represent neighborhoods surrounding FAT where noise sensitive locations (such as residences, schools, place of worship, etc. are likely to occur).
[2]Bold represents points exposed to CNEL of 65 dB or greater.

Legend: dB = decibel; CNEL = Community Noise Equivalent Level; ID = Identification; FAT = Fresno Yosemite International Airport; POI = Point of Interest.

Table 3-9 Noise Exposure Acreage in the Vicinity of FAT

CNEL (dB)	*Existing Conditions Acreage*		
	On Airport	*Off Airport*	*Total*
65–70	510	161	671
70–75	320	15	335
75–80	185	0	185
80–85	160	0	160
85+	50	0	50
Total >65 dB	**1,226**	**176**	**1,402**

Legend: CNEL = Community Noise Equivalent Level; dB = decibel; FAT = Fresno Yosemite International Airport.

The population and household analysis reviewed census block groups and included all households and population for each block group on Table 3-10 completely within each CNEL contour band. Across all airfields analyzed, for block groups partially within a CNEL contour band, the number of households and population were scaled based upon the proportion of block group area within each CNEL contour band for levels from 65 to 80 dB because households in these areas are generally equally distributed throughout each block group. Households are counted manually for CNEL bands of 80 dB and above because populations in these high noise areas are often not evenly distributed and 80 dB CNEL is the threshold to screen for the potential for hearing loss analysis. Table 3-10 lists estimated households and population off airport that are exposed to each CNEL contour band under existing conditions. Currently, 139 households and 406 people are within the 65 to 70 dB CNEL contour band. A total of 10 households and 28 people reside within the 70 to 75 dB CNEL contour band and no households or people occur within the 75 dB CNEL or greater contour bands.

Table 3-10 Estimated Households and Population in the Vicinity of FAT

CNEL Band (dB)	*Existing Conditions*	
	Households	*Population*
65–70	139	406
70–75	10	28
75–80	0	0
80–85	0	0
85+	0	0
Totals	**149**	**434**

Legend: CNEL = Community Noise Equivalent Level; dB = decibel.

3.1.2.3 Classroom Learning Interference

Table 3-11 presents the classroom learning interference for schools S-01 through S-24 experienced under existing conditions. The same school metrics computed for all non-school POIs are also included in Table 3-11 to cover any daycare facilities that could occur near other POIs, such as a daycare operated out of a personal residence. The school screening threshold of 60 dB $L_{eq(8hr)}$ equates to an interior level of 45 dB $L_{eq(8hr)}$ with windows open and represents the point at which studies have found classroom learning impacts (DNWG 2009a, 2013a). Existing operations at FAT results in 6 of the 24 school POIs exposed to exterior $L_{eq(8hr)}$ greater than or equal to 60 dB for windows open condition. Additional school impact analysis involves determining the number of noise-generated speech interfering events per school day hour that exceed an interior L_{max} of 50 dB (equivalent to an exterior L_{max} of 65 dB for windows open). The number of classroom interfering events ranges from 1 to 5 per school day hour, as presented in Table 3-11. The time above an interior level of 50 dB (equivalent to an exterior of 65 dB for windows open) varies from less than a minute to a maximum of 9 minutes per school day. Note that the results presented in Table 3-11 provide a conservative estimate assuming windows open. If classroom windows are closed, then $L_{eq(8hr)}$ would be approximately 10 dB less and the number of speech interfering events and time above results would likely decrease.

Table 3-11 Current Classroom Learning Interference in the Vicinity of FAT

ID	*Location*	*Outdoor $L_{eq(8hr)}$ (dB)[1]*	*Number of Speech Interfering Events per School Day Hour[2]*	*Time above interior 50 dB per 8-hour school day (minutes)[2]*
FR-C-01	Census Tract 45.03	55	1	6
FR-C-02	Census Tract 54.10	59	4	6
FR-C-03	Census Tract 54.03	59	1	5
FR-C-04	Census Tract 56.08	50	1	2
FR-C-05	Census Tract 53.02	**62**	3	8
FR-C-06	Census Tract 53.04	59	3	3
FR-C-07	Census Tract 31.02	55	1	2
FR-C-08	Census Tract 53.01	**61**	1	6
FR-C-09	Census Tract 53.05	**64**	5	6
FR-C-10	Census Tract 31.03	59	1	3
FR-C-11	Census Tract 52.04	59	6	3
FR-C-12	Census Tract 52.02	**67**	1	10
FR-C-13	Census Tract 52.03	55	1	2
FR-C-14	Census Tract 31.04	**72**	1	10
FR-C-15	Census Tract 58.04	53	1	2
FR-C-16	Census Tract 33.01	52	1	2
FR-C-17	Census Tract 32.01	59	1	3
FR-C-18	Census Tract 33.02	49	1	2
FR-C-19	Census Tract 32.02	54	1	2
FR-C-20	Census Tract 28	47	1	2
FR-C-21	Census Tract 29.06	53	1	3
FR-C-22	Census Tract 30.01	55	1	2
FR-C-23	Census Tract 58.05	56	1	2
FR-C-24	Census Tract 29.05	49	1	3
FR-C-25	Census Tract 29.04	46	1	2
FR-C-26	Census Tract 30.04	48	3	1
FR-C-27	Census Tract 30.03	45	1	-
FR-C-28	Census Tract 14.11	49	1	1
FR-C-29	Census Tract 14.12	55	5	3
FR-C-30	Census Tract 59.04	51	4	2
FR-H-01	Fresno VA Medical Center	47	6	2
FR-H-02	Care Facilities Network	**69**	2	10
FR-R-01	E. Gettysburg Avenue and N. Rowell Avenue	**63**	3	6
FR-R-02	E. Simpson Avenue and N. Winery Avenue	**68**	1	12
FR-R-03	E. Madison Avenue and N. Renn Avenue	55	2	2
CAFr-S-01	Fresno Regional Occupational Program, Tioga Middle, and Wolter Elementary	**61**	4	6
CAFr-S-02	University High and California State	55	2	2
CAFr-S-03	Truth Tabernacle Christian School	59	1	5
CAFr-S-04	Thomas Elementary	**63**	1	8
CAFr-S-05	Vinland Elementary	**61**	1	3
CAFr-S-06	College Community (Economic Opportunities Commission)	58	2	2
CAFr-S-07	Tarpey Elementary	55	1	3
CAFr-S-08	Maverick Prep Private School for Gifted Dyslexic Students	55	1	3

ID	*Location*	*Outdoor $L_{eq(8hr)}$ (dB)[1]*	*Number of Speech Interfering Events per School Day Hour[2]*	*Time above interior 50 dB per 8-hour school day (minutes)[2]*
CAFr-S-09	Viking Elementary and Fresno Unified School District-Viking Childcare	**65**	2	5
CAFr-S-10	Miramonte Elementary	48	5	2
CAFr-S-11	Carter G. Woodson Public Charter and Learn Academy	52	1	2
CAFr-S-12	Centennial Elementary, Dakota Circle (Economic Opportunities Commission), and Erma Duncan Polytechnical High	**60**	1	4
CAFr-S-13	Irwin O. Addicott Elementary Scandinavian Middle	**66**	1	9
CAFr-S-14	Roger S. Oraze Elementary	45	1	-
CAFr-S-15	McLane High	54	1	2
CAFr-S-16	Cup Large Day Care Center	56	1	2
CAFr-S-17	Ericson Elementary	57	1	3
CAFr-S-18	Sierra Charter and Violet Heintz Education Academy	59	2	3
CAFr-S-19	Virginia R. Boris Elementary	48	2	1
CAFr-S-20	Ewing Elementary and Remnant Christian School	50	1	3
CAFr-S-21	Fresno Adventist Academy	56	1	3
CAFr-S-22	Temperance-Kutner Elementary	56	1	2
CAFr-S-23	Molly S. Bakman Elementary and Turner Elementary	49	4	2
CAFr-S-24	Fancher Creek Elementary	51	1	1

Notes: [1]Bold text represent schools exposed to exterior $L_{eq(8hr)}$ of greater than 60 dB, equivalent to the recommended interior threshold of 45 dB with windows open.
[2]Assumes 90 percent of ANG daytime operations occur during the school day; windows open condition with Noise Level Reduction of 15 dB due to building attenuation.

Legend: dB = decibel; ID = Identification; FAT = Fresno Yosemite International Airport; ID = Identification; $L_{eq(8hr)}$ = 8-hour Equivalent Sound Level.

3.1.2.4 Non-school Speech Interference

Table 3-12 presents the existing speech interference (non-school) based upon the number of events per average hour during the CNEL daytime period for both a windows open and windows closed condition. The number of speech-interfering events with windows open is none at 7 POIs and ranges from 1 to 5 events per hour at the remaining 52 POIs, with the greatest occurring at CAFr-C-08 Census Tract 31.04 centroid point. With windows closed, the number of POIs experiencing at least one speech-interfering event per hour decreases to 12 POIs with a range of 1 to 2 events per hour.

Table 3-12 Current Non-school Speech Interference Events per Average Hour in the Vicinity of FAT

Map ID[1]	*Named POI*	*Windows Open[2]*	*Windows Closed[3]*
CAFr-C-01	Census Tract 45.03	1	0
CAFr-C-02	Census Tract 54.10	2	0
CAFr-C-03	Census Tract 54.03	1	0
CAFr-C-04	Census Tract 56.08	1	0

Map ID[1]	*Named POI*	*Windows Open[2]*	*Windows Closed[3]*
CAFr-C-05	Census Tract 53.02	3	1
CAFr-C-06	Census Tract 53.04	1	0
CAFr-C-07	Census Tract 31.02	1	0
CAFr-C-08	Census Tract 53.01	2	0
CAFr-C-09	Census Tract 53.05	2	1
CAFr-C-10	Census Tract 31.03	1	0
CAFr-C-11	Census Tract 52.04	1	0
CAFr-C-12	Census Tract 52.02	4	1
CAFr-C-13	Census Tract 52.03	1	0
CAFr-C-14	Census Tract 31.04	5	2
CAFr-C-15	Census Tract 58.04	1	0
CAFr-C-16	Census Tract 33.01	1	0
CAFr-C-17	Census Tract 32.01	1	0
CAFr-C-18	Census Tract 33.02	1	0
CAFr-C-19	Census Tract 32.02	1	0
CAFr-C-20	Census Tract 28	0	0
CAFr-C-21	Census Tract 29.06	0	0
CAFr-C-22	Census Tract 30.01	1	0
CAFr-C-23	Census Tract 58.05	1	0
CAFr-C-24	Census Tract 29.05	1	0
CAFr-C-25	Census Tract 29.04	0	0
CAFr-C-26	Census Tract 30.04	1	0
CAFr-C-27	Census Tract 30.03	0	0
CAFr-C-28	Census Tract 14.11	1	0
CAFr-C-29	Census Tract 14.12	2	0
CAFr-C-30	Census Tract 59.04	1	0
CAFr-H-01	Fresno VA Medical Center	0	0
CAFr-H-02	Care Facilities Network	4	1
CAFr-R-01	E. Gettysburg Avenue and N. Rowell Avenue	3	1
CAFr-R-02	E. Simpson Avenue and N. Winery Avenue	4	1
CAFr-R-03	E. Madison Avenue and N. Renn Avenue	1	0
CAFr-S-01	Fresno ROP, Tioga Middle, and Wolter	2	1
CAFr-S-02	University High and California State	1	0
CAFr-S-03	Truth Tabernacle Christian School	1	0
CAFr-S-04	Thomas Elementary	3	1
CAFr-S-05	Vinland Elementary	1	0
CAFr-S-06	College Community (Economic Opportunities Commission) Head Start Community College	1	0
CAFr-S-07	Tarpey Elementary	1	0
CAFr-S-08	Maverick Prep Private School for Gifted Dyslexic Students	1	0
CAFr-S-09	Viking Elementary and Fresno Unified School District-Viking Childcare	2	1
CAFr-S-10	Miramonte Elementary	1	0
CAFr-S-11	Carter G. Woodson Public Charter and Learn Academy	1	0
CAFr-S-12	Centennial Elementary, Dakota Circle (Economic Opportunities Commission), and Erma Duncan Polytechnical High	1	0
CAFr-S-13	Irwin O. Addicott Elementary Scandinavian Middle	3	1
CAFr-S-14	Roger S. Oraze Elementary	0	0
CAFr-S-15	McLane High	1	0
CAFr-S-16	Cup Large Day Care Center	1	0

Map ID[1]	*Named POI*	*Windows Open*[2]	*Windows Closed*[3]
CAFr-S-17	Ericson Elementary	1	0
CAFr-S-18	Sierra Charter and Violet Heintz Education Academy	1	0
CAFr-S-19	Virginia R. Boris Elementary	1	0
CAFr-S-20	Ewing Elementary and Remnant Christian School	1	0
CAFr-S-21	Fresno Adventist Academy	1	0
CAFr-S-22	Temperance-Kutner Elementary	1	0
CAFr-S-23	Molly S. Bakman Elementary and Turner Elementary	0	0
CAFr-S-24	Fancher Creek Elementary	1	0

Notes: [1]School POIs included because residential areas or other noise sensitive uses are often located nearby schools for which these results would apply.
[2]Assumes 15 dB Noise Level Reduction.
[3]Assumes 25 dB Noise Level Reduction.
Legend: FAT = Fresno Yosemite International Airport; ID = Identification; POI = Point of Interest.

3.1.2.5 Probability of Awakening

Analysis of the potential for sleep disturbance involves determining the number and SEL of CNEL nighttime aircraft events to estimate the PA metric. As detailed in Table 3-13, PA with windows open ranges from less than 1 percent at 36 POIs and between 1 and 30 percent at the remaining 23 POIs. PA with windows closed ranges from less than 1 percent at 44 POIs, and between 1 and 20 percent at the remaining 15 POIs.

Table 3-13 Current Estimated Probability of Awakening in the Vicinity of FAT

Map ID	*Named POI*[1]	*Windows Open*[2]	*Windows Closed*[3]
CAFr-C-01	Census Tract 45.03	<1%	<1%
CAFr-C-02	Census Tract 54.10	1%	1%
CAFr-C-03	Census Tract 54.03	1%	1%
CAFr-C-04	Census Tract 56.08	<1%	<1%
CAFr-C-05	Census Tract 53.02	5%	4%
CAFr-C-06	Census Tract 53.04	<1%	<1%
CAFr-C-07	Census Tract 31.02	<1%	<1%
CAFr-C-08	Census Tract 53.01	3%	2%
CAFr-C-09	Census Tract 53.05	4%	3%
CAFr-C-10	Census Tract 31.03	<1%	<1%
CAFr-C-11	Census Tract 52.04	1%	<1%
CAFr-C-12	Census Tract 52.02	14%	9%
CAFr-C-13	Census Tract 52.03	1%	<1%
CAFr-C-14	Census Tract 31.04	30%	20%
CAFr-C-15	Census Tract 58.04	<1%	<1%
CAFr-C-16	Census Tract 33.01	1%	<1%
CAFr-C-17	Census Tract 32.01	<1%	<1%
CAFr-C-18	Census Tract 33.02	1%	<1%
CAFr-C-19	Census Tract 32.02	<1%	<1%
CAFr-C-20	Census Tract 28	<1%	<1%
CAFr-C-21	Census Tract 29.06	<1%	<1%
CAFr-C-22	Census Tract 30.01	<1%	<1%
CAFr-C-23	Census Tract 58.05	<1%	<1%

Map ID	*Named POI*[1]	*Windows Open*[2]	*Windows Closed*[3]
CAFr-C-24	Census Tract 29.05	<1%	<1%
CAFr-C-25	Census Tract 29.04	<1%	<1%
CAFr-C-26	Census Tract 30.04	<1%	<1%
CAFr-C-27	Census Tract 30.03	<1%	<1%
CAFr-C-28	Census Tract 14.11	<1%	<1%
CAFr-C-29	Census Tract 14.12	1%	<1%
CAFr-C-30	Census Tract 59.04	<1%	<1%
CAFr-H-01	Fresno VA Medical Center	<1%	<1%
CAFr-H-02	Care Facilities Network	11%	7%
CAFr-R-01	E. Gettysburg Avenue and N. Rowell Avenue	6%	4%
CAFr-R-02	E. Simpson Avenue and N. Winery Avenue	20%	13%
CAFr-R-03	E. Madison Avenue and N. Renn Avenue	1%	1%
CAFr-S-01	Fresno Regional Occupational Program, Tioga Middle, and Wolter	3%	2%
CAFr-S-02	University High and California State	<1%	<1%
CAFr-S-03	Truth Tabernacle Christian School	2%	1%
CAFr-S-04	Thomas Elementary	7%	5%
CAFr-S-05	Vinland Elementary	<1%	<1%
CAFr-S-06	College Community (Economic Opportunities Commission) Head Start Community College	<1%	<1%
CAFr-S-07	Tarpey Elementary	<1%	<1%
CAFr-S-08	Maverick Prep Private School for Gifted Dyslexic Students	<1%	<1%
CAFr-S-09	Viking Elementary and Fresno Unified School District-Viking Childcare	<1%	<1%
CAFr-S-10	Miramonte Elementary	<1%	<1%
CAFr-S-11	Carter G. Woodson Public Charter and Learn Academy	1%	<1%
CAFr-S-12	Centennial Elementary, Dakota Circle (Economic Opportunities Commission), and Erma Duncan Polytechnical High	1%	<1%
CAFr-S-13	Irwin O. Addicott Elementary Scandinavian Middle	9%	6%
CAFr-S-14	Roger S. Oraze Elementary	<1%	<1%
CAFr-S-15	McLane High	<1%	<1%
CAFr-S-16	Cup Large Day Care Center	<1%	<1%
CAFr-S-17	Ericson Elementary	<1%	<1%
CAFr-S-18	Sierra Charter and Violet Heintz Education Academy	<1%	<1%
CAFr-S-19	Virginia R. Boris Elementary	<1%	<1%
CAFr-S-20	Ewing Elementary and Remnant Christian School	<1%	<1%
CAFr-S-21	Fresno Adventist Academy	<1%	<1%
CAFr-S-22	Temperance-Kutner Elementary	1%	<1%
CAFr-S-23	Molly S. Bakman Elementary and Turner Elementary	<1%	<1%
CAFr-S-24	Fancher Creek Elementary	<1%	<1%

Notes: [1]Non-residential POIs included because residential areas are often located nearby other noise sensitive areas for which these results would apply.
[2]Assumes 15 dB Noise Level Reduction.
[3]Assumes 25 dB Noise Level Reduction.

Legend: FAT = Fresno Yosemite International Airport; ID = Identification; POI = Point of Interest.

3.1.2.6 Potential for Hearing Loss

DoD guidance prescribes analysis of the potential for hearing loss (PHL) resulting from elevated aircraft noise levels. The screening process begins by identifying residential areas exposed to CNEL of 80 dB or greater (DNWG 2013b). Figure 3-3 presents the current areas currently exposed to CNEL of 80 dB or greater overlaid with the 75 dB $L_{eq(24hr)}$ contour line, which represents the lowest $L_{eq(24hr)}$ that is considered for the PHL analysis if also exposed to CNEL of 80 dB. As previously summarized in Tables 3-9 and 3-10 and depicted in Figure 3-3, no land outside of FAT is exposed to 80 dB CNEL or greater, so no residents experience the PHL for the existing conditions.

3.2 SPECIAL USE AIRSPACE

As depicted in Figure 1-2, the 144 FW utilizes both over-land and over-water airspace. The following section describes the modeling data and resulting noise exposure for both subsonic and supersonic operations.

3.2.1 Modeling Data (Subsonic)

The 144 FW trains in a variety of SUA with the primary emphasis in Warning Area (W-) 283/285 and the Hunter MOA Complex. This airspace is shared with other units including other services. The 144 FW currently flies 1,811 annual sorties divided across SUA, with 93 percent of time spent above 10,000 feet MSL.

3.2.2 Noise Exposure (Subsonic)

In most of the locations, the 144 FW sorties contribute $CNEL_{mr}$ less than 35 dB on the ground below the SUA, with 35 dB being the lower noise level limit of the noise modeling software. For reference, a $CNEL_{mr}$ of 35 dB is consistent with ambient noise levels typically found in rural or remote areas with minimal or no human sources of noise (vehicle traffic, regular or low altitude aircraft flights, etc.).

Because the overwater training area W-283/285 is far from land, no amount of training there would generate significant noise impacts on land. With airspace use varying over time, this analysis considers the 'worst-case' condition where all 144 FW flying activity would occur in overland airspace. Given these assumptions, noise levels generated by existing operations in overland SUA are 40 dB $CNEL_{mr}$. In terms of CNEL, the existing activity also results in a maximum of CNEL of less than 40 dB. The actual distribution of operations across multiple training areas makes the resulting noise much lower than this. However, those levels are too low to accurately assess given the lower noise limit of the modeling software.

3.2.3 Modeling Data (Supersonic)

The current operating areas for the supersonic operations by the 144 FW comprise the overwater ranges in W-283/285 located 15 miles from land with minimum altitudes for supersonic of 10,000 feet MSL.

3.2.4 Noise Exposure (Supersonic)

With W-283/285 airspace located 15 miles from land and supersonic flights limited to a minimum altitude of 10,000 feet MSL, human receptors are sufficiently far away to not be impacted by current supersonic fighter activity by 144 FW.

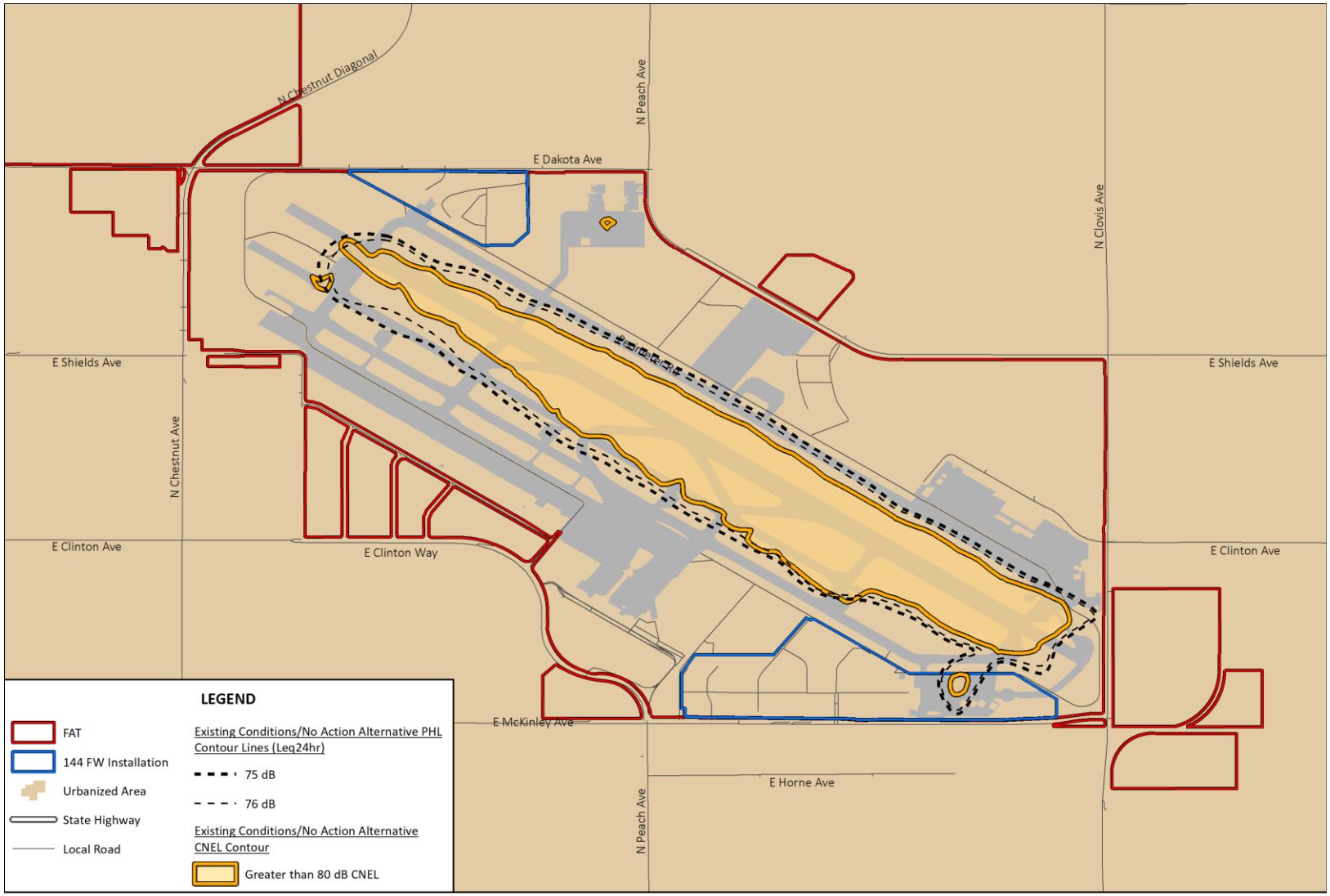

Figure 3-3 Current Potential for Hearing Loss in the Vicinity of FAT

4.0 PROPOSED ACTION ALTERNATIVES AND AFTERBURNER SCENARIOS

The following section details the modeling data and the resultant noise exposure for five afterburner scenarios, in which either the F-15EX or F-35A aircraft would replace the F-15C aircraft of the 144 FW at FAT, as described in Section 1.1. All other aircraft operations (other than based F-15C) are assumed to remain unchanged from those described in Section 3.0, *Existing Conditions* for this analysis.

4.1 INSTALLATION

4.1.1 Modeling Data

Under this proposal, the 18 F-15C aircraft based at FAT would be replaced with either 21 F-15EX aircraft or 21 F-35A aircraft. For this analysis, two F-15EX afterburner scenarios and three F-35A afterburner scenarios have been modeled. Should either of these aircraft be based at FAT, it is most likely that the F-15EX would fly approximately 15 percent of the time using afterburner on takeoff and the F-35A would fly approximately 5 percent of the time using afterburner on takeoff. Though for the sake of a robust analysis, these varied afterburner scenarios have been analyzed. With a planned flying hour program of 5,250 annually for either F-15EX or F-35A and an assumed sortie duration matching current F-15C at 1.65 hours, the result would be 3,182 annual proposed sorties that would occur under all five analyzed proposed afterburner scenarios. Consistent with the existing conditions, some of these sorties would occur at other airfields but for a conservative analysis, it has been assumed that all sorties would occur at FAT.

Each F-15EX or F-35A sortie would generate a departure and arrival operation and the number of closed patterns is assumed to proportionally match the current F-15C closed patterns. Currently, F-15C generate 90 closed pattern events (or 180 operations) and F-15EX or F-35A would be assumed to perform a similar ratio of closed patterns per sortie, as summarized below:

- Annual Flying hours = 5,250
- Average Sortie Duration = 1.6 (to match average F-15C)
- Annual Sorties = 3,281
- Annual Operations = 6,888
  - Departures = 3,281
  - Arrivals = 3,281
  - Closed Patterns = 326 (proportional to existing F-15C rate)
- Day/night operations = Assumed same as existing F-15C (night = 10 p.m. to 7 a.m. [2200 to 0700])
  - Depart at night = 0.1 percent (approximately 4 times per year)
  - Arrive at night = 4 percent (approximately 134 times per year)
  - Closed pattern at night = 0 percent

Table 4-1 details the modeled annual flight operations at FAT that would occur under any of the five proposed afterburner scenarios. Should either the F-15EX or the F-35A be based at FAT, which would eliminate all F-15C operations and would add 6,888 F-15EX or F-35A flight operations per year. All other aircraft operations would remain the same as described under the existing conditions.

Table 4-1 Proposed Aircraft Operations for FAT

Group	Aircraft	Departures			Arrivals			Closed Patterns[1]			Totals			
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Total
144 FW	F-15EX or F-35A	3,022	255	4	3,022	134	125	300	26	-	6,344	415	129	6,888
Other Mil	C-26, UH60, CH47	715	48	17	704	54	22	360	27	13	1,779	129	52	1,960
Civil	Civil Total	27,331	9,142	3,708	21,842	10,044	8,345	-	-	-	49,173	19,186	12,053	80,412
Grand Total		31,068	9,445	3,729	25,568	10,232	8,492	660	53	13	57,296	19,730	12,234	89,260

Note: [1]Closed patterns counted as two operations.
Legend: 144 FW = 144th Fighter Wing; FAT = Fresno Yosemite International Airport.

4.1.1.1 Departures

The principal difference between the proposed aircraft afterburner scenarios involves the use of afterburner for departure operations. The follow describes the five scenarios considered in this analysis:

- F-15EX Scenario A = F-15EX afterburner use on 15 percent of departures (most likely)
- F-15EX Scenario B = F-15EX afterburner use on 50 percent of departures
- F-35A Scenario A = F-35A afterburner use on 5 percent of departures (most likely)
- F-35A Scenario B = F-35A afterburner use on 50 percent of departures
- F-35A Scenario C = F-35A afterburner use on 95 percent of departures

4.1.1.2 Arrivals and Closed Patterns

The F-15EX and F-35A proposed alternatives would follow the same arrival types at similar rates proportional to the existing F-15C, and would perform closed patterns at FAT only as required (primarily for Functional Check Flights).

4.1.1.3 CNEL Evening (7 p.m.–10 p.m. [1900–2200]) and CNEL Nighttime (10 p.m.–7 a.m. [2200–0700]) Operations

CNEL evening and nighttime operations at FAT would remain low for either F-15EX or F-35A proposed alternatives and at similar proportion as current F-15C. Total CNEL evening operations would be 6 percent (415 operations per year) and total CNEL nighttime would be 2 percent (129 operations per year). All closed patterns would occur during the daytime period.

4.1.1.4 Runway Use

The proposed F-15EX and F-35A aircraft would utilize FAT runways at the same proportion as the current F-15C aircraft. Based upon wind, the primary flow would remain to the northwest with Runway 29R use ranging from 49 to 59 percent and Runway 29L ranging from 31 to 41 percent, depending upon operation type and wind conditions. The remaining approximate 10 percent of operations would continue to occur on Runway 11L or 11R as dictated by wind.

4.1.1.5 Maintenance or Static Operations

Tables 4-2 and 4-3 present the representative run-up operations profiles for the F-15EX and F-35A alternatives, respectively, that would replace the current F-15C run-ups. Note that the run-up type operations for either F-15EX or F-35A would not change for the analyzed 'afterburner scenarios,' which only apply to departure flight operations. The other current run-ups, such as Army helicopters, would continue as described under the existing conditions. Figure 3-1 identifies the locations modeled for existing conditions run-up operations, which would be utilized under the proposed alternatives.

Table 4-2 F-15EX Scenarios Annual Maintenance and Ground Engine Runs

Aircraft	*Description*	*Pad*	*Heading (deg)*	*Power (%NC)*	*Num Engines*	*Duration*	*Annual Events*	*Day/Eve/Night Split*[1]
F-15EX (modeled with F-15EX GE129)	Ground Runs	Ramp 1, 50% of events Ramp 2, 50% of events	Ramp1=150 Ramp2= 20	68% (idle)	1	30 mins	624	90% / 10% / 0%
			Ramp1=150 Ramp2= 20	75%	1	20 secs	24	90% / 10% / 0%
	Arm/ De-Arm	Ramp 1	150	68% (idle)	2	5 mins	200	90% / 10% / 0%
	Arm/ De-Arm	Ramp 2	110	68% (idle)	2	5 mins	200	90% / 10% / 0%
	Hush House Engine Runs	HH	270	63	1	32 mins	12	100% / 0% / 0%
				80	1	13 mins		
				92	1	7 mins		
				63	1	33 mins		
				80	1	13 mins		
				92	1	6 mins		

Notes: [1]Day = 7:00 a.m.–10:00 p.m. (0700–2200), Night = 10:00 p.m.–7:00 a.m. (2200–0700).
Legend: % = percent; %NC = percent speed of the compressor.

Table 4-3 F-35A Annual Maintenance and Ground Engine Runs

Aircraft	*Description*	*Pad*	*Heading*	*Power (%NC)*	*Num Engines*	*Duration*	*Annual Events*	*Day/Eve/Night Split*[1]
F-35A	VSIBIT	10	110	10	1	5 mins	150	90% / 10% / 0%
		31	110	31	1	3 mins		
		10	110	10	1	5 mins		
	High Speed, Low Thrust	10	110	10	1	5 mins	50	90% / 10% / 0%
		10	110	10	1	3 mins		
		10	110	10	1	5 mins		
	Arm/De-Arm, Runway 20	ARM-20	55	15% (idle)	2	5 mins	200	90% / 10% / 0%
	Arm/De-Arm, Runway 20	ARM-02	110	15% (idle)	2	5 mins	200	90% / 10% / 0%
	Hush House Engine Runs	HH	270	15	1	32 mins	2	100% / 0% / 0%
				80	1	13 mins		
				90	1	7 mins		

Notes: [1]Day = 7:00 a.m.–10:00 p.m. (0700–2200), Night = 10:00 p.m.–7:00 a.m. (2200–0700).
[2]ETR = Engine Thrust Request
Legend: % = percent; %NC = percent speed of the compressor.

4.1.2 Noise Exposure

Sections 4.1.2.1 through 4.1.2.6 focus on DoD best practices for impact analysis at airfields, as summarized in DNWG guidance (DNWG 2009a). FAA Order 1050.1F impact analysis applicable to airfields is presented in Section 4.1.2.7.

4.1.2.1 Community Noise Equivalent Level Contours and POI Levels

Figure 4-1 shows the CNEL noise contours from 65 to 85 dB in 5-dB increments for the F-15EX 15 percent afterburner scenario at FAT. As with current operations, noise generated from aircraft operations at FAT occurs within and outside of the airfield. Figure 4-2 depicts a comparison of the F-15EX 15 percent afterburner scenario to existing conditions. The newly exposed areas to the north and south would be due to a combination of the increase in operations and the F-15EX engine generating greater noise.

Figure 4-3 shows the CNEL noise contours from 65 to 85 dB in 5-dB increments for the F-15EX 50 percent afterburner scenario at FAT. As with current operations, noise generated from aircraft operations at FAT occurs within and outside of the airfield. Figure 4-4 depicts a comparison of the F-15EX 50 percent afterburner scenario to existing conditions. The newly exposed areas to the north and south would be due to a combination of the increase in operations and the F-15EX engine generating greater noise.

Although the two F-15EX afterburner scenarios would result in similar sizes and shapes of CNEL contours, when compared with non-afterburner departures, afterburner departures create greater noise levels adjacent to the primary runway that would result in wider contours to the north and south of FAT. On the other hand, afterburner departures allow the aircraft to gain speed and altitude quicker which would result in a greater distance between the aircraft and the ground in areas along most departure corridors. This is the cause for the shorter length of the 65 dB CNEL contour to the northwest of FAT for the 50 percent afterburner scenario when compared with the 15 percent afterburner scenario.

Figure 4-5 shows the CNEL noise contours from 65 to 85 dB in 5-dB increments for the F-35A at FAT with 5 percent afterburner usage. As with current operations, noise generated from aircraft operations at FAT occurs within and outside of the airfield. Figure 4-6 depicts a comparison of the F-35A 5 percent afterburner scenario to existing conditions. The newly exposed areas to the west and north would include residential and commercial areas while the newly exposed areas to the southeast are primarily agricultural land.

Figure 4-7 shows the CNEL noise contours from 65 to 85 dB in 5-dB increments for the F-35A 50 percent afterburner scenario at FAT. As with current operations, noise generated from aircraft operations at FAT occurs within and outside of the airfield. Figure 4-8 depicts a comparison of the F-35A 50 percent afterburner scenario to existing conditions. The newly exposed areas to the west and north would include residential and commercial areas while the newly exposed areas to the southeast are primarily agricultural land.

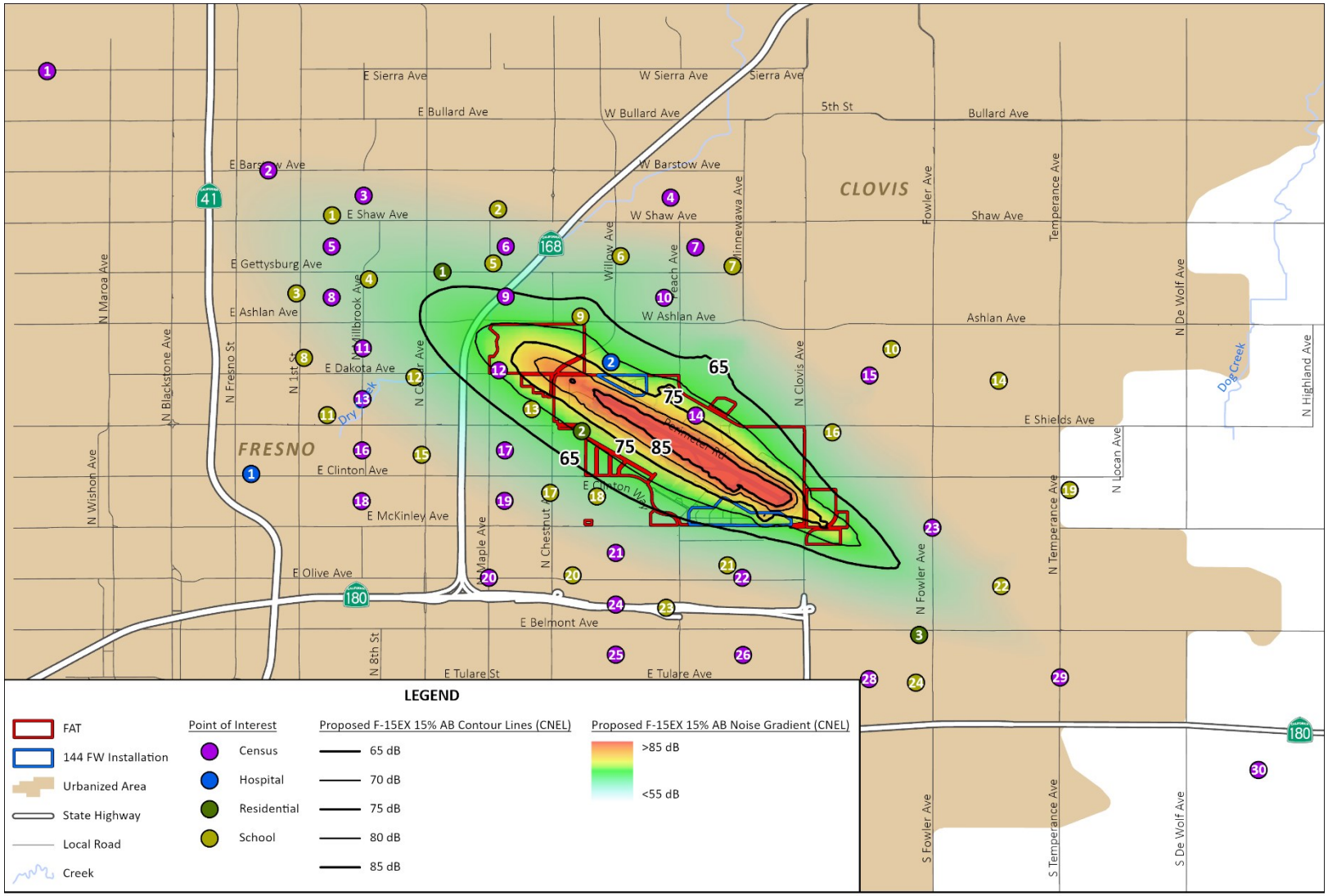

Figure 4-1 F-15EX 15 Percent Afterburner Scenario – CNEL Contours and Gradient

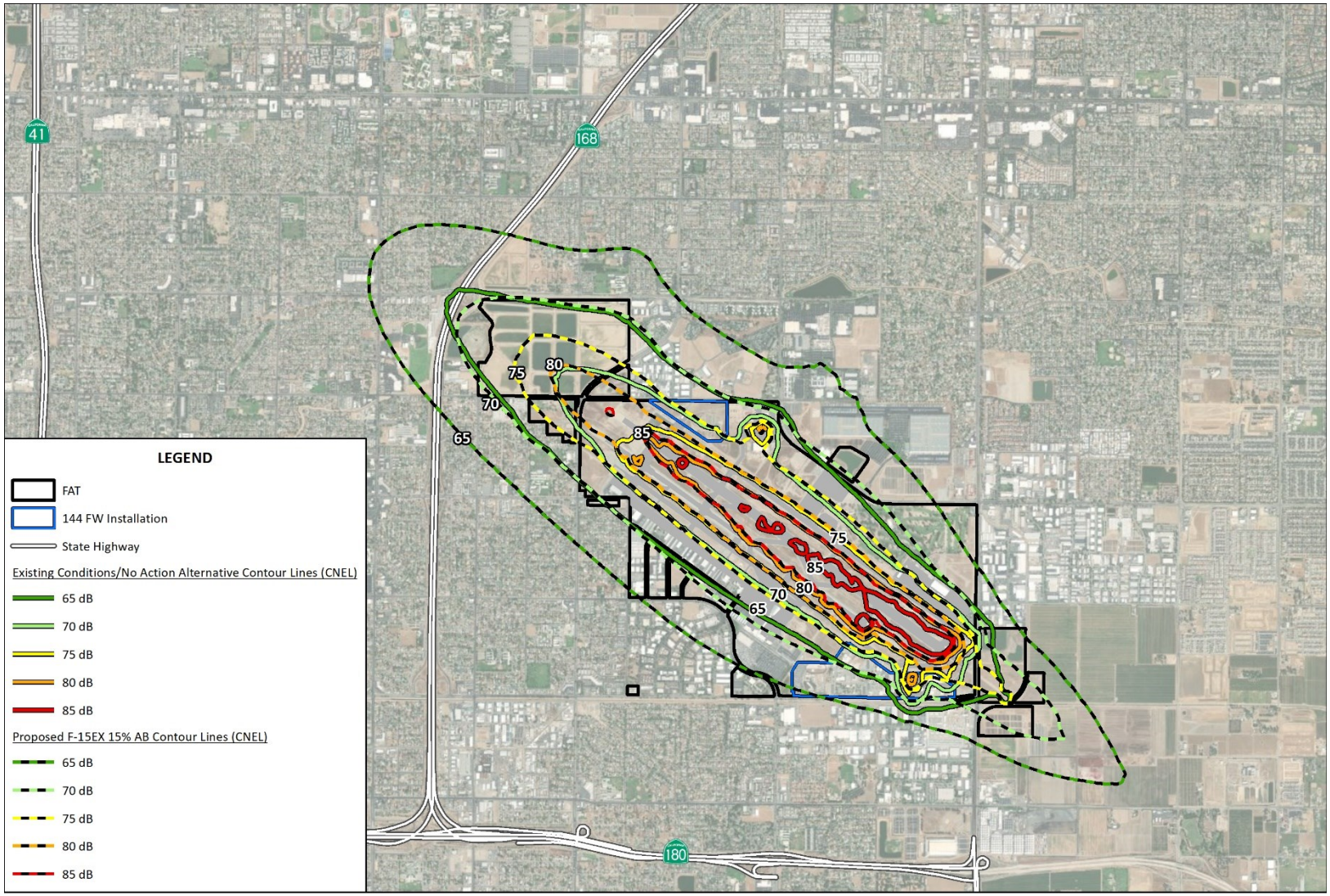

Figure 4-2 F-15EX 15 Percent Afterburner Scenario Comparison to Existing Conditions – CNEL Contours

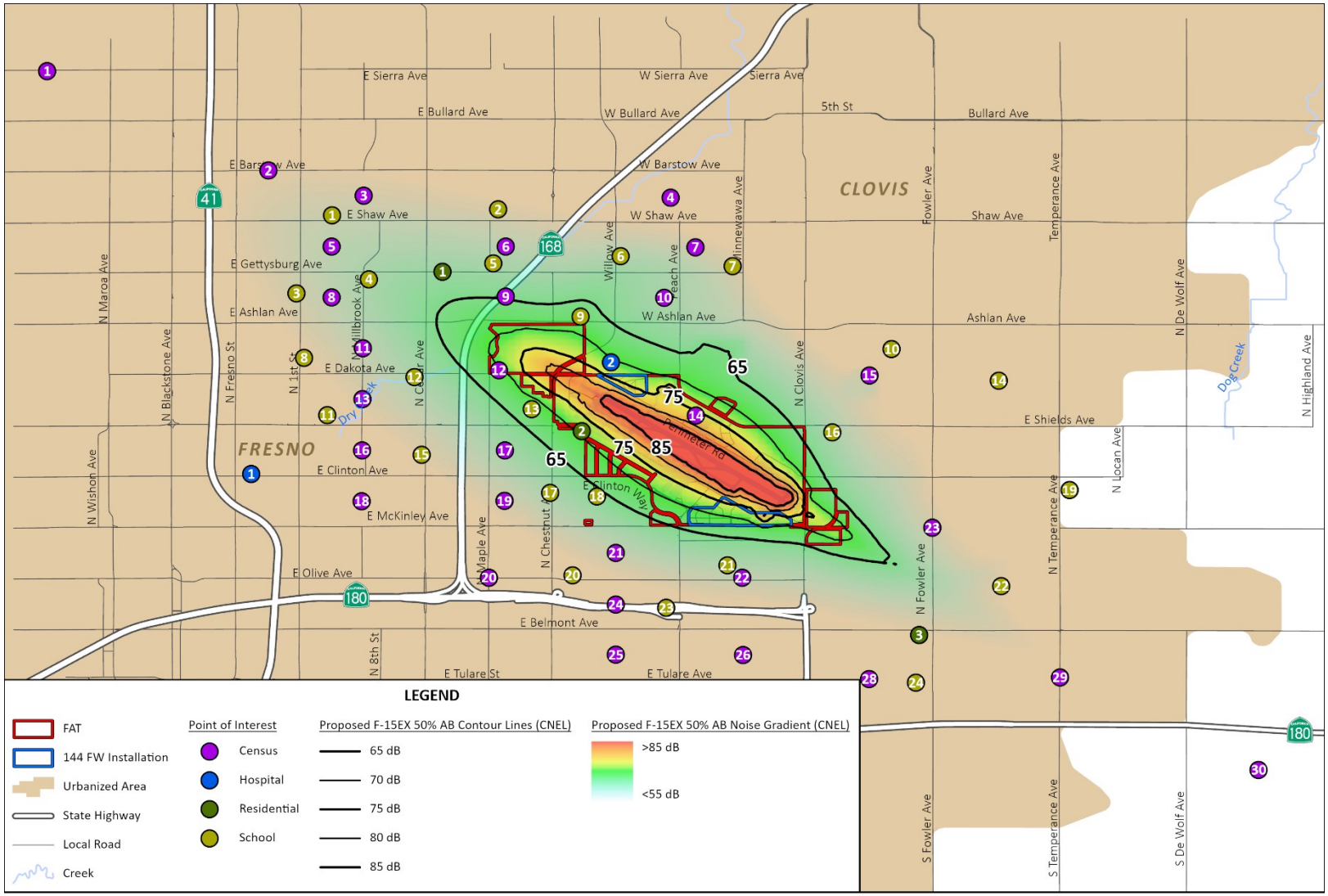

Figure 4-3 F-15EX 50 Percent Afterburner Scenario – CNEL Contours and Gradient

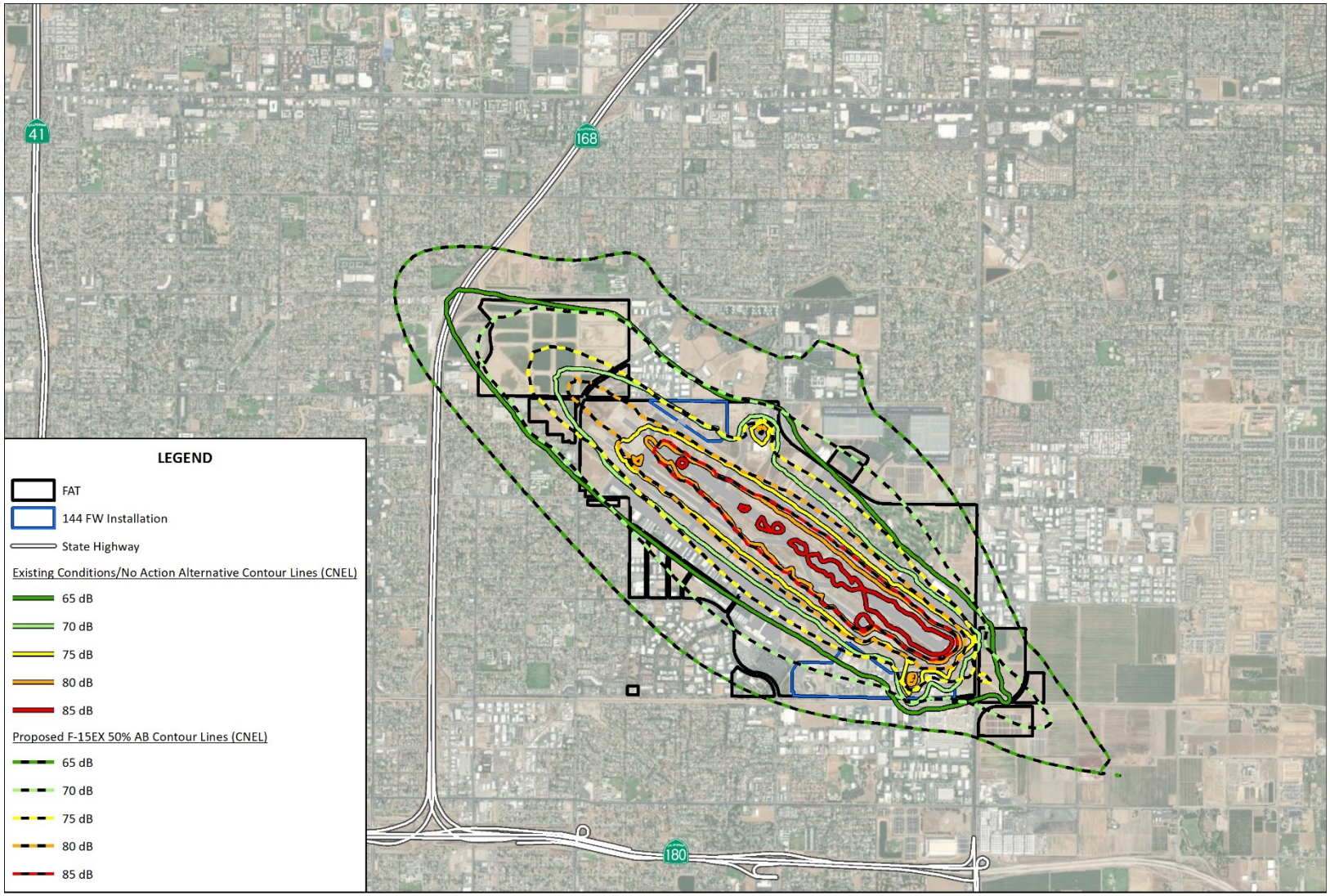

Figure 4-4 F-15EX 50 Percent Afterburner Scenario Comparison to Existing Conditions – CNEL Contours

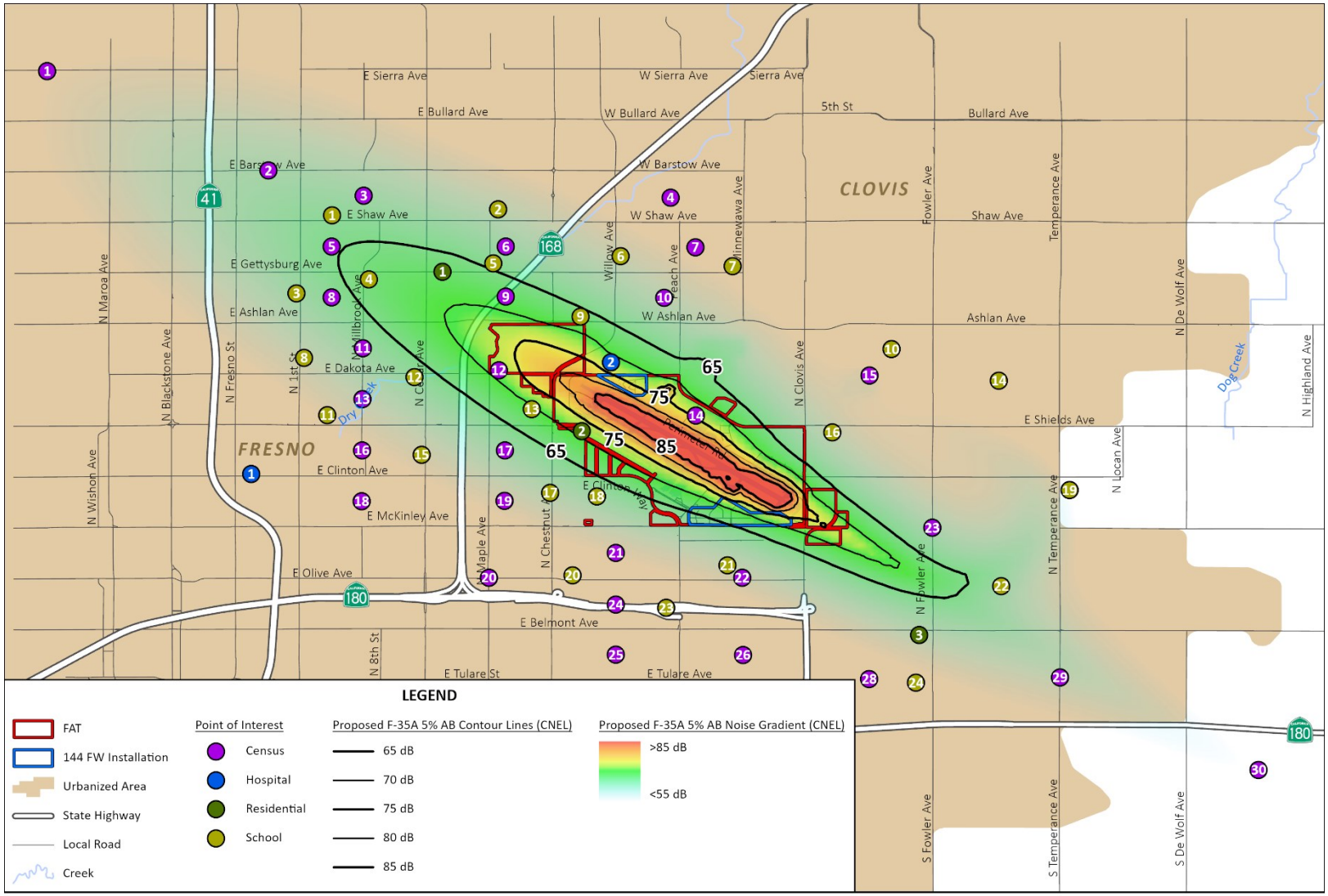

Figure 4-5 F-35A 5 Percent Afterburner Scenario – CNEL Contours and Gradient

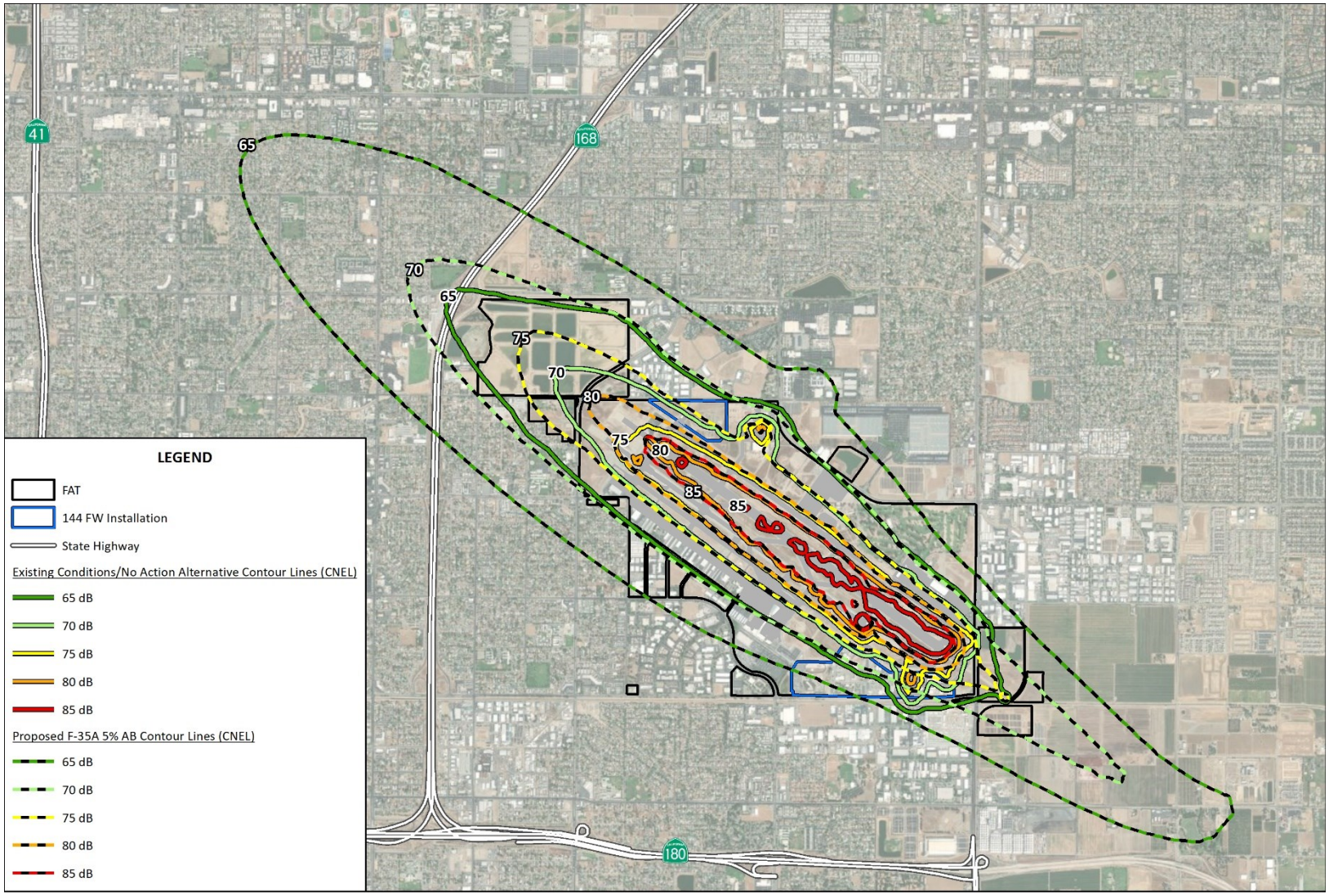

Figure 4-6 F-35A 5 Percent Afterburner Scenario Comparison to Existing Conditions – CNEL Contours

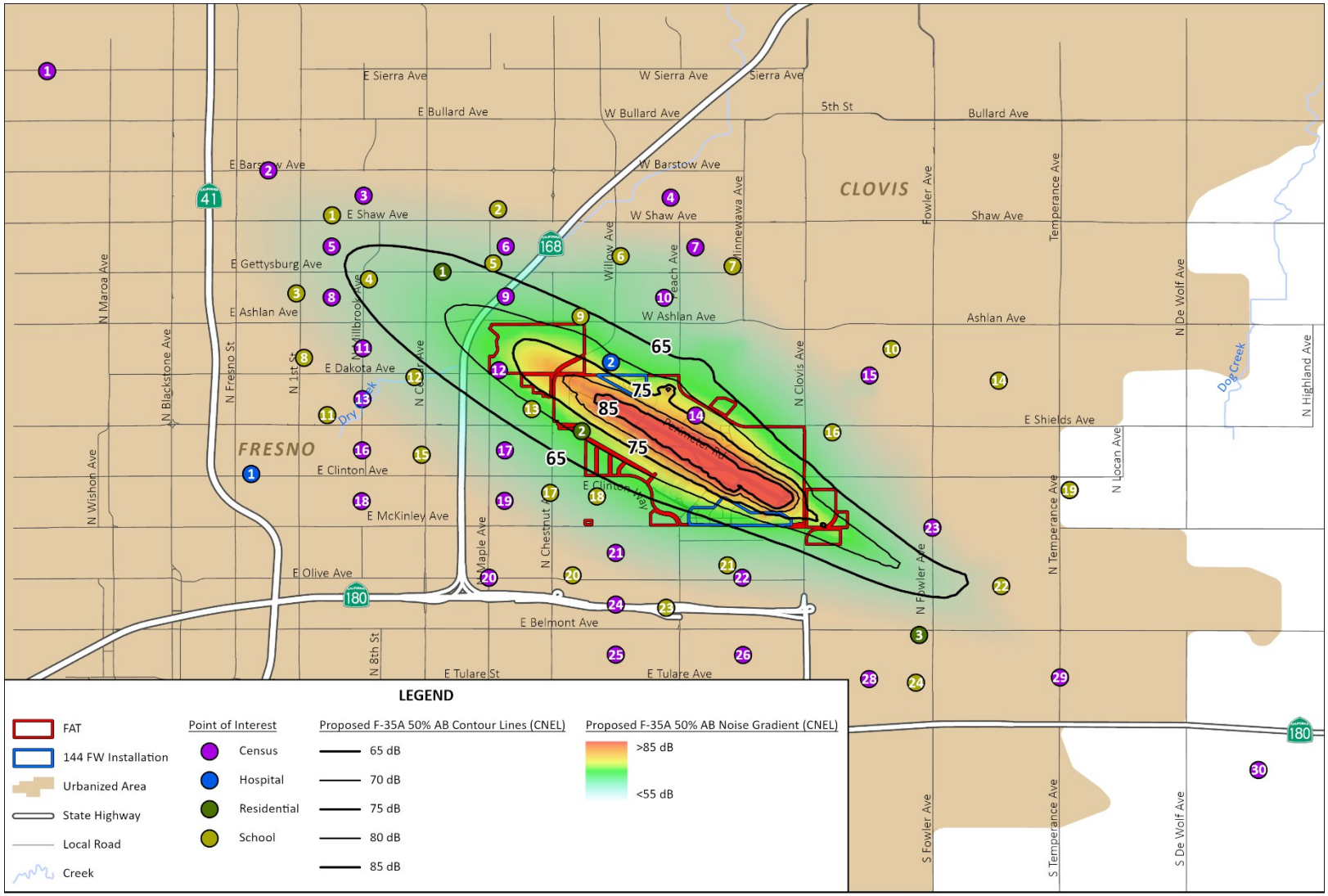

Figure 4-7 F-35A 50 Percent Afterburner Scenario – CNEL Contours and Gradient

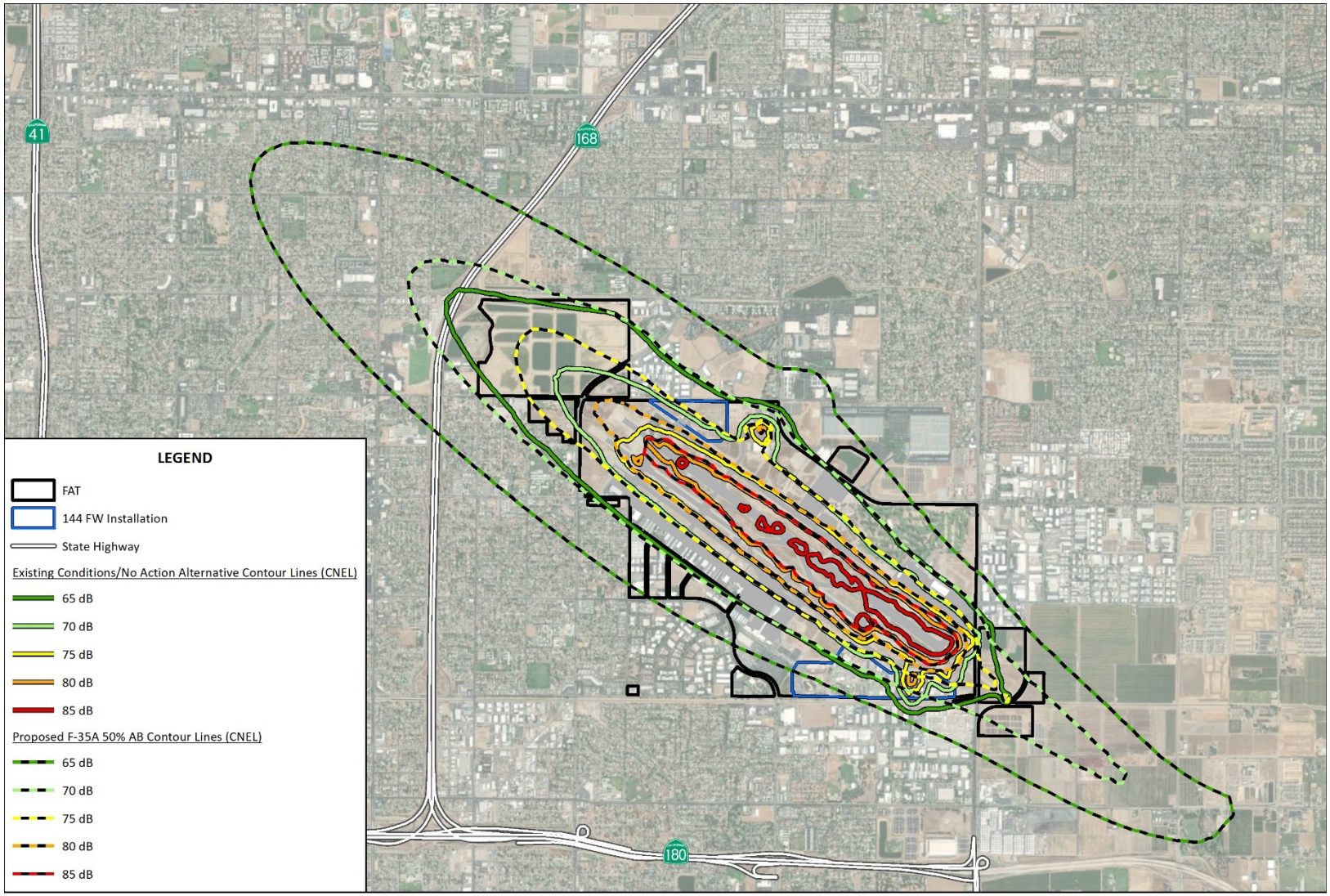

Figure 4-8 F-35A 50 Percent Afterburner Scenario Comparison to Existing Conditions – CNEL Contours

Figure 4-9 shows the CNEL noise contours from 65 to 85 dB in 5-dB increments for the F-35A 95 percent afterburner scenario at FAT. As with current operations, noise generated from aircraft operations at FAT occurs within and outside of the airfield. Figure 4-10 depicts a comparison of the F-35A 95 percent afterburner scenario to existing conditions. The newly exposed areas to the west and north would include residential and commercial areas while the newly exposed areas to the southeast are primarily agricultural land.

Although the three F-35A afterburner scenarios would result in similar sizes and shapes of CNEL contours, when compared with non-afterburner departures, afterburner departures create greater noise levels adjacent to the primary runway that would result in wider contours to the north and south of FAT. On the other hand, afterburner departures allow the aircraft to gain speed and altitude quicker which would result in a greater distance between the aircraft and the ground in areas along most departure corridors. This is the cause for the shorter length of the 65 dB CNEL contour to the northwest of FAT for the 95 percent afterburner F-35A scenario when compared with the 50 or 5 percent afterburner F-35A scenarios.

Figure 4-11 presents a comparison of the 65 dB CNEL contour that result from each of the five proposed scenarios to existing conditions. The three F-35A afterburner scenarios would result in very similar 65 dB CNEL contours and would be larger to the northwest and southeast than either of the F-15EX scenarios. The following discussion analyzes representative POIs to compare noise levels between each of these scenarios in more detail.

Table 4-4 details the calculated CNEL at all POIs for existing conditions and the five proposed alternatives and Table 4-5 the numbers of POIs that would be exposed to relevant CNEL thresholds of 65, 70, and 75 dB in CNEL along with a summary of the number of POIs experiencing a decrease, no change, or several magnitudes of increase. Both the F-15EX 15 and 50 percent scenarios would result in 7 POIs exposed to CNEL of 65 dB or greater (an increase of 3 POIs), 3 to 4 POIs exposed to CNEL of 70 dB or greater (an increase of 3 to 4 POIs), and 1 POI exposed to CNEL of 75 dB or greater (an increase of 1 POI). The F-35A 5 percent scenario would result in 10 POIs exposed to CNEL of 65 dB or greater (an increase of 6 POIs), 4 POIs exposed to CNEL of 70 dB or greater (an increase of 4 POIs), and no POIs exposed to CNEL of 75 dB or greater (same as existing). Both the F-35A 50 and 90 percent scenarios would result in 9 POIs exposed to CNEL of 65 dB or greater (an increase of 5 POIs), 4 POIs exposed to CNEL of 70 dB or greater (an increase of 4 POIs), and no POIs exposed to CNEL of 75 dB or greater (same as existing).

In terms of relative change to CNEL, the F-15EX 15 percent scenario would result in 6 POIs that would experience either a decrease or no change to CNEL, 3 POIs that would experience an increase in CNEL of 1 dB, 32 POIs that would experience an increase in CNEL of 2 to 4 dB, and 18 POIs that would experience an increase in CNEL of 5 dB or greater. The F-15EX 50 percent scenario would result in 8 POIs that would experience either a decrease or no change to CNEL, 4 POIs that would experience an increase in CNEL of 1 dB, 26 POIs that would experience an increase in CNEL of 2 to 4 dB CNEL, and 21 POIs that would experience an increase in CNEL of 5 dB greater.

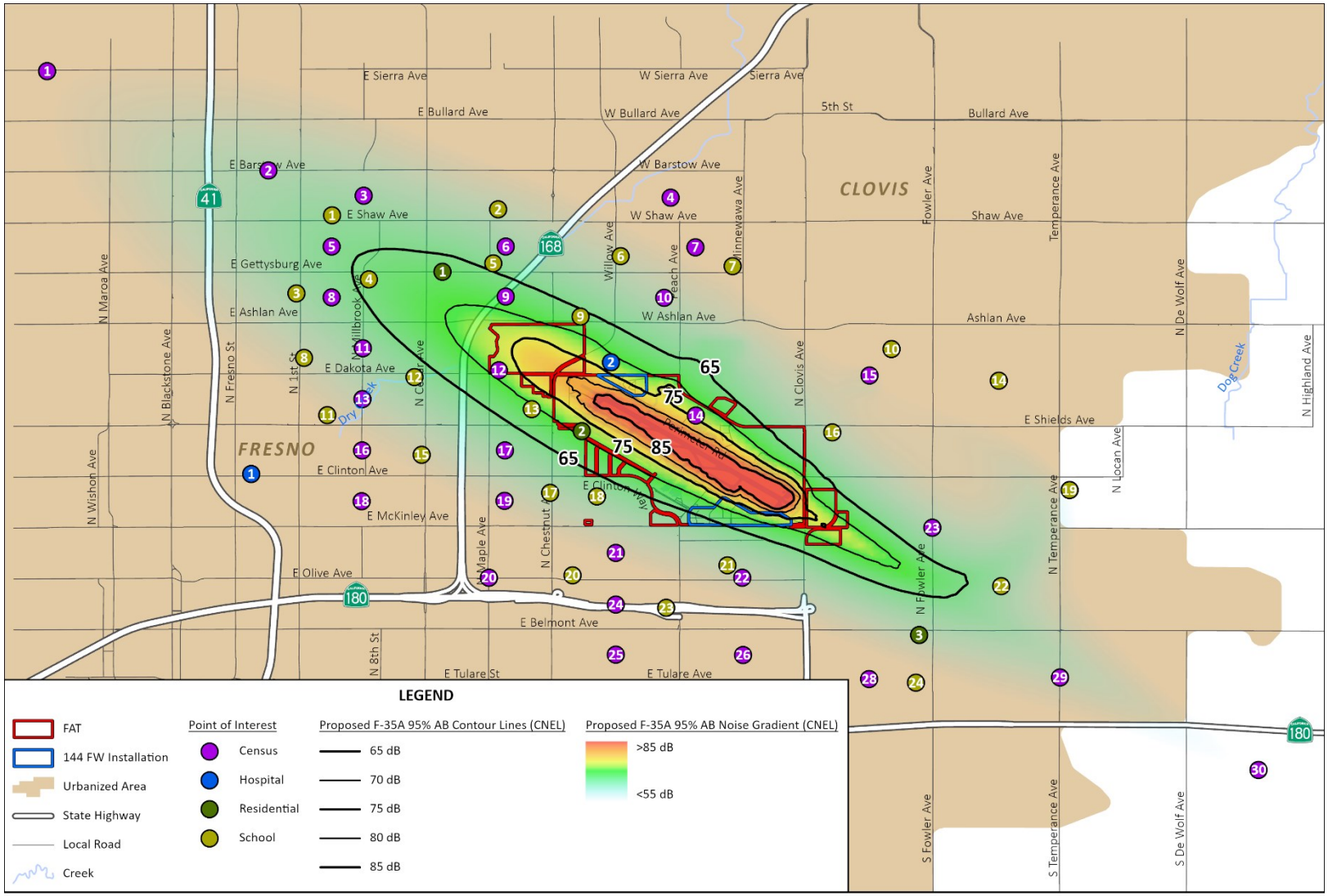

Figure 4-9 F-35A 95 Percent Afterburner Scenario – CNEL Contours and Gradient

Source: CA ANG 2022, ESRI 2022

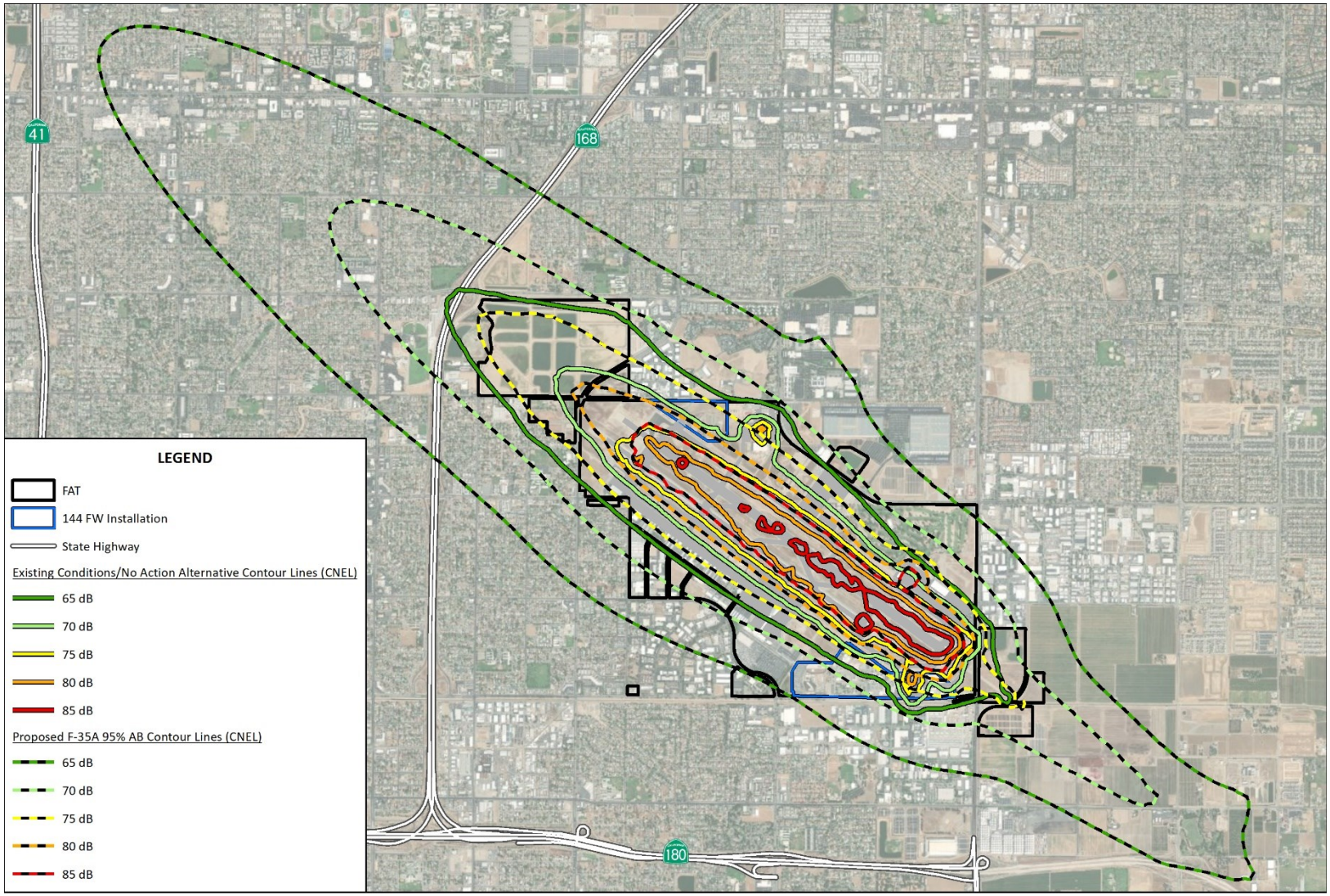

Figure 4-10 F-35A 95 Percent Afterburner Scenario Comparison to Existing Conditions – CNEL Contours

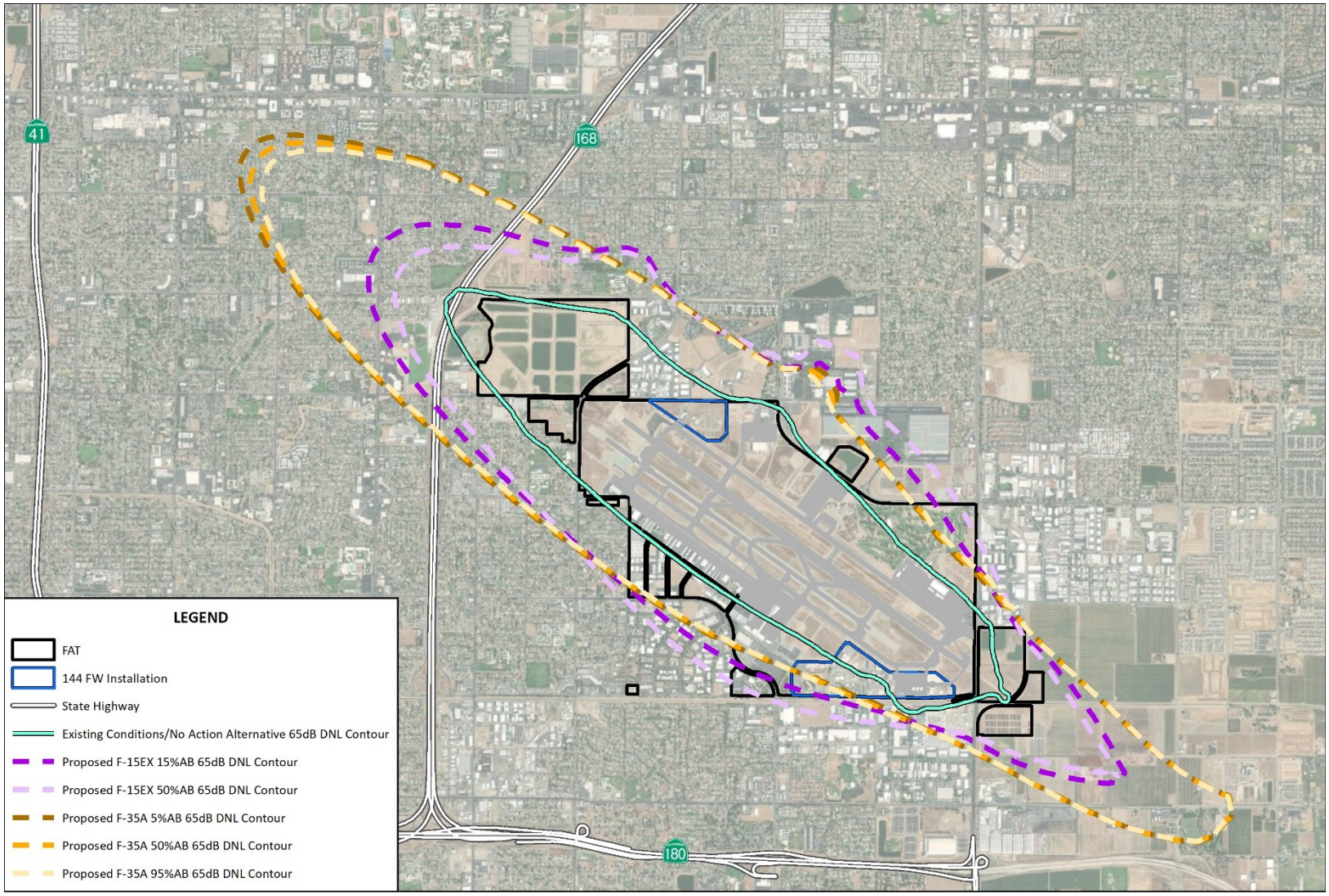

Figure 4-11 Comparison of 65 dB CNEL Contours Across All Afterburner Scenarios

Table 4-4 CNEL at POIs for All Afterburner Scenarios in the Vicinity of FAT

Map ID	*Named POI*	*Existing Conditions/ No Action*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-C-01	Census Tract 45.03	52	50 (-2)	50 (-2)	55 (+3)	55 (+3)	55 (+3)
FR-C-02	Census Tract 54.10	56	56 (0)	55 (-1)	61 (+5)	61 (+5)	60 (+4)
FR-C-03	Census Tract 54.03	56	57 (+1)	57 (+1)	62 (+6)	61 (+5)	61 (+5)
FR-C-04	Census Tract 56.08	48	52 (+4)	52 (+4)	52 (+4)	52 (+4)	52 (+4)
FR-C-05	Census Tract 53.02	60	60 (0)	59 (-1)	**65 (+5)**	64 (+4)	64 (+4)
FR-C-06	Census Tract 53.04	56	60 (+4)	59 (+3)	62 (+6)	62 (+6)	62 (+6)
FR-C-07	Census Tract 31.02	52	57 (+5)	57 (+5)	54 (+2)	54 (+2)	54 (+2)
FR-C-08	Census Tract 53.01	58	60 (+2)	59 (+1)	64 (+6)	63 (+5)	63 (+5)
FR-C-09	Census Tract 53.05	62	**66 (+4)**	**65 (+3)**	**68 (+6)**	**68 (+6)**	**68 (+6)**
FR-C-10	Census Tract 31.03	56	61 (+5)	61 (+5)	59 (+3)	59 (+3)	59 (+3)
FR-C-11	Census Tract 52.04	56	59 (+3)	59 (+3)	62 (+6)	62 (+6)	62 (+6)
FR-C-12	Census Tract 52.02	**65**	**71 (+6)**	**69 (+4)**	**72 (+7)**	**72 (+7)**	**72 (+7)**
FR-C-13	Census Tract 52.03	53	56 (+3)	56 (+3)	58 (+5)	58 (+5)	58 (+5)
FR-C-14	Census Tract 31.04	**69**	**75 (+6)**	**76 (+7)**	**74 (+5)**	**74 (+5)**	**74 (+5)**
FR-C-15	Census Tract 58.04	50	55 (+5)	57 (+7)	56 (+6)	56 (+6)	56 (+6)
FR-C-16	Census Tract 33.01	50	53 (+3)	53 (+3)	55 (+5)	55 (+5)	55 (+5)
FR-C-17	Census Tract 32.01	56	61 (+5)	61 (+5)	62 (+6)	62 (+6)	62 (+6)
FR-C-18	Census Tract 33.02	48	51 (+3)	51 (+3)	52 (+4)	52 (+4)	52 (+4)
FR-C-19	Census Tract 32.02	52	56 (+4)	57 (+5)	57 (+5)	57 (+5)	57 (+5)
FR-C-20	Census Tract 28	46	50 (+4)	50 (+4)	50 (+4)	50 (+4)	51 (+5)
FR-C-21	Census Tract 29.06	51	57 (+6)	58 (+7)	56 (+5)	56 (+5)	56 (+5)
FR-C-22	Census Tract 30.01	53	57 (+4)	58 (+5)	57 (+4)	57 (+4)	58 (+5)
FR-C-23	Census Tract 58.05	54	58 (+4)	57 (+3)	61 (+7)	61 (+7)	61 (+7)
FR-C-24	Census Tract 29.05	47	51 (+4)	52 (+5)	51 (+4)	51 (+4)	52 (+5)
FR-C-25	Census Tract 29.04	44	47 (+3)	48 (+4)	48 (+4)	48 (+4)	49 (+5)
FR-C-26	Census Tract 30.04	47	50 (+3)	50 (+3)	51 (+4)	51 (+4)	51 (+4)
FR-C-27	Census Tract 30.03	43	46 (+3)	46 (+3)	47 (+4)	47 (+4)	48 (+5)
FR-C-28	Census Tract 14.11	47	50 (+3)	50 (+3)	53 (+6)	53 (+6)	53 (+6)
FR-C-29	Census Tract 14.12	54	54 (0)	54 (0)	59 (+5)	58 (+4)	58 (+4)
FR-C-30	Census Tract 59.04	51	50 (-1)	50 (-1)	55 (+4)	55 (+4)	55 (+4)
FR-H-01	Fresno VA Medical Center	46	48 (+2)	48 (+2)	50 (+4)	50 (+4)	50 (+4)
FR-H-02	Care Facilities Network	**66**	**71 (+5)**	**71 (+5)**	**72 (+6)**	**72 (+6)**	**72 (+6)**
FR-R-01	E. Gettysburg Avenue and N. Rowell Avenue	61	63 (+2)	62 (+1)	**67 (+6)**	**67 (+6)**	**67 (+6)**
FR-R-02	E. Simpson Avenue and N. Winery Avenue	**66**	**71 (+5)**	**71 (+5)**	**71 (+5)**	**71 (+5)**	**71 (+5)**
FR-R-03	E. Madison Avenue and N. Renn Avenue	53	56 (+3)	55 (+2)	59 (+6)	59 (+6)	59 (+6)
FR-S-01	Fresno Regional Occupational Program, Tioga Middle, and Wolter	59	59 (0)	58 (-1)	63 (+4)	63 (+4)	63 (+4)
FR-S-02	University High and California State	53	57 (+4)	56 (+3)	59 (+6)	59 (+6)	59 (+6)
FR-S-03	Truth Tabernacle Christian School	57	58 (+1)	57 (0)	62 (+5)	62 (+5)	61 (+4)
FR-S-04	Thomas Elementary	61	62 (+1)	61 (0)	**66 (+5)**	**66 (+5)**	**66 (+5)**
FR-S-05	Vinland Elementary	58	62 (+4)	61 (+3)	64 (+6)	64 (+6)	64 (+6)
FR-S-06	College Community (Economic Opportunities Commission) Head Start Community College	55	60 (+5)	60 (+5)	58 (+3)	58 (+3)	58 (+3)
FR-S-07	Tarpey Elementary	52	56 (+4)	56 (+4)	54 (+2)	54 (+2)	55 (+3)

Map ID	*Named POI*	*Existing Conditions/ No Action*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-S-08	Maverick Prep Private School for Gif	53	55 (+2)	55 (+2)	58 (+5)	58 (+5)	58 (+5)
FR-S-09	Viking Elementary and Fresno Unified School District-Viking Childcare	62	**67 (+5)**	**67 (+5)**	**66 (+4)**	**66 (+4)**	**66 (+4)**
FR-S-10	Miramonte Elementary	46	50 (+4)	51 (+5)	52 (+6)	52 (+6)	53 (+7)
FR-S-11	Carter G. Woodson Public Charter and Learn Academy	50	54 (+4)	53 (+3)	56 (+6)	55 (+5)	55 (+5)
FR-S-12	Centennial Elementary, Dakota Circle (Economic Opportunities Commission), and Erma Duncan Polytechnical High	57	61 (+4)	60 (+3)	63 (+6)	63 (+6)	63 (+6)
FR-S-13	Irwin O. Addicott Elementary and Scandinavian Middle	63	**68 (+5)**	**68 (+5)**	**69 (+6)**	**69 (+6)**	**69 (+6)**
FR-S-14	Roger S. Oraze Elementary	43	46 (+3)	47 (+4)	50 (+7)	50 (+7)	50 (+7)
FR-S-15	McLane High	51	56 (+5)	56 (+5)	57 (+6)	57 (+6)	57 (+6)
FR-S-16	Cup Large Day Care Center	54	59 (+5)	60 (+6)	58 (+4)	59 (+5)	59 (+5)
FR-S-17	Ericson Elementary	54	60 (+6)	61 (+7)	60 (+6)	60 (+6)	60 (+6)
FR-S-18	Sierra Charter and Violet Heintz Education Academy	57	63 (+6)	64 (+7)	62 (+5)	62 (+5)	62 (+5)
FR-S-19	Virginia R. Boris Elementary	46	48 (+2)	48 (+2)	55 (+9)	55 (+9)	55 (+9)
FR-S-20	Ewing Elementary and Remnant Christian School	48	53 (+5)	53 (+5)	52 (+4)	53 (+5)	53 (+5)
FR-S-21	Fresno Adventist Academy	54	59 (+5)	60 (+6)	58 (+4)	58 (+4)	59 (+5)
FR-S-22	Temperance-Kutner Elementary	54	56 (+2)	55 (+1)	62 (+8)	62 (+8)	62 (+8)
FR-S-23	Molly S. Bakman Elementary and Turner Elementary	47	50 (+3)	51 (+4)	51 (+4)	52 (+5)	52 (+5)
FR-S-24	Fancher Creek Elementary	49	51 (+2)	51 (+2)	54 (+5)	54 (+5)	54 (+5)

Legend: % = percent; CNEL = Community Noise Equivalent Level; FAT = Fresno Yosemite International Airport; ID = Identification; POI = Point of Interest.

Table 4-5 Change to CNEL at POIs for All Afterburner Scenarios in the Vicinity of FAT

Condition	*Existing Conditions / No Action*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
Number of POIs exposed to 65 dB CNEL or greater	4	7	7	10	9	9
Number of POIs exposed to 70 dB CNEL or greater	0	4	3	4	4	4
Number of POIs exposed to 75 dB CNEL or greater	0	1	1	0	0	0
Change to number of POIs exposed to 65 dB CNEL		+3	+3	+6	+5	+5
Change to number of POIs exposed to 70 dB CNEL		+4	+3	+4	+4	+4
Change to number of POIs exposed to 75 dB CNEL		+1	+1	+0	+0	+0
Number of POIs with decrease of 1 dB or greater		2	5	0	0	0
Number of POIs with no change		4	3	0	0	0
Number of POIs with increase of 1 dB		3	4	0	0	0
Number of POIs with increase of 2 to 4 dB		32	26	21	20	16
Number of POIs with increase of 5 dB or greater		18	21	38	39	43

Legend: % = percent; CNEL = Community Noise Equivalent Level; dB = decibel; FAT = Fresno Yosemite International Airport; POI = Point of Interest.

In terms of relative change to CNEL, the F-35A 5 percent scenario would result in no POIs that would experience no change to CNEL, no POIs that would experience an increase in CNEL of 1 dB, 21 POIs that would experience an increase in CNEL of 2 to 4 dB, and 38 POI that would experience an increase in CNEL of 5 dB or greater. The F-35A 50 percent scenario would result in no POIs that would experience no change to CNEL, no POIs that would experience an increase in CNEL of 1 dB, 20 POIs that would experience an increase in CNEL of 2 to 4 dB, and 39 POIs that would experience an increase in CNEL of 5 dB or greater. The F-35A 95 percent scenario would result in no POIs that would experience no change to CNEL, no POIs that would experience an increase in CNEL of 1 dB, 16 POIs that would experience an increase in CNEL of 2 to 4 dB, and 43 POI that would experience an increase in CNEL of 5 dB or greater.

4.1.2.2 Acreage, Housing, and Population

Table 4-6 presents acreage for both on and off airport for all proposed alternatives and the change in acreage relative to existing conditions. Under the F-15EX 15 percent scenario, a total of 1,262 off-airport acres would be exposed to 65 dB CNEL or greater, an increase of 1,086 acres from existing conditions. The off-airport acreage would be composed of 1,069 acres exposed to 65 to 70 dB CNEL (an increase of 908 acres), 169 acres exposed to 70 to 75 dB CNEL (an increase of 154 acres), 18 acres exposed to 75 to 80 dB CNEL (an increase of 18 acres), 6 acres exposed to 80 to 85 dB CNEL (an increase of 6 acres). No areas off airport would be exposed to CNEL greater than 85 dB under the F-15EX 15 percent scenario.

Under the F-15EX 50 percent scenario a total of 1,268 off-airport acres would be exposed to 65 dB CNEL or greater, an increase of 1,062 acres from existing conditions. The off-airport acreage would be composed of 1,065 acres exposed to 65 to 70 dB CNEL (an increase of 904 acres), 157 acres exposed to 70 to 75 dB CNEL (an increase of 142 acres), 12 acres exposed to 75 to 80 dB CNEL (an increase of 12 acres), 3 acres exposed to 80 to 85 dB CNEL (an increase of 3 acres). No areas off airport would be exposed to CNEL greater than 85 dB under the F-15EX 50 percent scenario.

Under the F-35A 5 percent scenario, off-airport acreage exposed to greater than 65 dB CNEL would be 1,936 an increase of 1,759 from existing conditions. The off-airport acreage would be composed of 1,582 acres exposed to 65 to 70 dB CNEL (an increase of 1,421 acres), 329 acres exposed to 70 to 75 dB CNEL (an increase of 314 acres), 24 acres exposed to 75 to 80 dB CNEL (an increase of 24 acres), 1 acres exposed to 80 to 85 dB CNEL (an increase of 1 acre). No areas off airport would be exposed to greater than 85 dB under the F-35A 5 percent scenario.

Under the F-35A 50 percent scenario, off-airport acreage exposed to greater than 65 dB CNEL would be 1,882 an increase of 1,706 from existing conditions. The off-airport acreage would be composed of 1,533 acres exposed to 65 to 70 dB CNEL (an increase of 1,372 acres), 324 acres exposed to 70 to 75 dB CNEL (an increase of 309 acres), 25 acres exposed to 75 to 80 dB CNEL (an increase of 25 acres), no acres exposed to 80 to 85 dB CNEL (same as existing). No areas off airport would be exposed to greater than 85 dB under the F-35A 50 percent scenario.

Under the F-35A 95 percent scenario, off-airport acreage exposed to greater than 65 dB CNEL would be 1,831 an increase of 1,655 from existing conditions. The off-airport acreage would be composed of 1,486 acres exposed to 65 to 70 dB CNEL (an increase of 1,325 acres), 321 acres exposed to 70 to 75 dB CNEL (an increase of 306 acres), 24 acres exposed to 75 to 80 dB CNEL (an increase of 24 acres), 0 acres exposed to 80 to 85 dB CNEL (same as existing). No areas off airport would be exposed to greater than 85 dB under the F-35A 95 percent scenario.

Table 4-6 Acreage within CNEL for All Afterburner Scenarios in the Vicinity of FAT

Scenario	*CNEL (dB)*	*On Airport*	*Off Airport*	*Total*	*Change Relative to Existing Conditions/| No Action*		
					On Airport	*Off Airport*	*Total*
F-15EX 15% AB	65-70	265	1,069	1,334	-245	+908	+663
	70-75	503	169	672	+183	+154	+337
	75-80	358	18	376	+173	+18	+191
	80-85	242	6	248	+82	+6	+88
	85+	204	0	204	+153	0	+153
	Total >65 dB	**1,572**	**1,262**	**2,834**	**+346**	**+1,086**	**+1,431**
F-15EX 50% AB	65-70	250	1,065	1,315	-260	+904	+644
	70-75	522	157	679	+202	+142	+344
	75-80	371	12	382	+185	+12	+197
	80-85	229	3	232	+69	+3	+72
	85+	232	0	232	+182	0	+182
	Total >65 dB	**1,604**	**1,238**	**2,842**	**+378**	**+1,062**	**+1,439**
F-35A 5% AB	65-70	261	1,582	1,843	-249	+1,421	+1,172
	70-75	479	329	808	+159	+314	+473
	75-80	369	24	393	+184	+24	+208
	80-85	206	1	207	+45	+1	+46
	85+	211	0	211	+160	0	+160
	Total >65 dB	**1,526**	**1,936**	**3,462**	**+300**	**+1,759**	**+2,059**
F-35A 50% AB	65-70	260	1,533	1,793	-250	+1,372	+1,122
	70-75	476	324	800	+156	+309	+465
	75-80	373	25	398	+188	+25	+213
	80-85	200	0	200	+40	0	+40
	85+	220	0	220	+169	0	+169
	Total >65 dB	**1,529**	**1,882**	**3,411**	**+303**	**+1,706**	**+2,009**
F-35A 95% AB	65-70	260	1,486	1,746	-250	+1,325	+1,074
	70-75	473	321	794	+153	+306	+459
	75-80	379	24	403	+194	+24	+218
	80-85	196	0	196	+36	0	+36
	85+	224	0	224	+173	0	+173
	Total >65 dB	**1,532**	**1,831**	**3,362**	**+306**	**+1,655**	**+1,960**

Legend: % = percent; AB = afterburner; CNEL = Community Noise Equivalent Level; dB = decibel; FAT = Fresno Yosemite International Airport.

Table 4-7 presents the acreage, households, and population estimations by CNEL band for each proposed scenario at FAT for areas outside of the airport.

Table 4-7 Acreage, Households, and Estimated Population by CNEL Contour in the Vicinity of FAT

Scenario	*CNEL (dB)*	*Off-Base Acreage*	*Households*	*Estimated Population*	*Change from Existing Conditions/No Action*		
					Acreage	*Households*	*Estimated Population*
F-15EX 15% AB	65–70	1,069	1,774	5,577	+908	+1,635	+5,171
	70–75	169	139	404	+154	+129	+376
	75–80	18	12	30	+18	+12	+30
	80–85	6	4	12	+6	+4	+12
	85+	0	0	0	0	0	0
	Total	**1,262**	**1,929**	**6,023**	**+1,086**	**+1,780**	**+5,589**
F-15EX 50% AB	65–70	1,065	1,539	4,823	+904	+1,400	+4,417
	70–75	157	122	343	+142	+112	+315
	75–80	12	8	22	+12	+8	+22
	80–85	3	3	7	+3	+3	+7
	85+	0	0	0	0	0	0
	Total	**1,238**	**1,672**	**5,195**	**+1,062**	**+1,523**	**+4,761**
F-35A 5% AB	65–70	1,582	3,680	11,081	+1,421	+3,541	+10,675
	70–75	329	408	1,264	+314	+398	+1,236
	75–80	24	16	43	+24	+16	+43
	80–85	1	1	2	+1	+1	+2
	85+	0	0	0	0	0	0
	Total	**1,936**	**4,105**	**12,390**	**+1,759**	**+3,956**	**+11,956**
F-35A 50% AB	65–70	1,533	3,502	10,599	+1,372	+3,363	+10,193
	70–75	324	397	1,230	+309	+387	+1,202
	75–80	25	17	44	+25	+17	+44
	80–85	0	0	0	0	0	0
	85+	0	0	0	0	0	0
	Total	**1,882**	**3,916**	**11,873**	**+1,706**	**+3,767**	**+11,439**
F-35A 95% AB	65–70	1,486	3,326	10,122	+1,325	+3,187	+9,716
	70–75	321	387	1,200	+306	+377	+1,172
	75–80	24	16	43	+24	+16	+43
	80–85	0	0	0	0	0	0
	85+	0	0	0	0	0	0
	Total	**1,831**	**3,729**	**11,365**	**+1,655**	**+3,580**	**+10,931**

Legend: % = percent; AB = afterburner; CNEL = Community Noise Level Equivalent; dB = decibel; FAT = Fresno Yosemite International Airport.

Under the F-15EX 15 percent scenario, a total of 1,774 households and 5,577 people would be exposed to CNEL of 65 to 70 dB, an increase of 1,635 households and 5,171 people. This increase would be due to the general increase in length and width of the 65 dB CNEL contour caused by the increase in operations and the greater noise generated by the F-15EX engine. Table 4-7 reflects an increase of 125 additional households and 376 people that would be exposed to 70 to 75 dB CNEL and 4 additional households and 12 additional people that would be exposed to 75 to 80 dB under the F-15EX 15 percent scenario. Under the F-15EX 50 percent scenario, a total of 1,539 households and 4,823 people would be exposed to CNEL of 65 to 70 dB, an increase of 1,400 households and 4,417 people. This increase would be due to the general increase in length and width of the 65 dB CNEL contour caused by the increase in operations and the greater noise generated by the F-15EX engine. Table 4-7 reflects an increase of 112 additional households and

315 people that would be exposed to 70 to 75 dB CNEL and 8 additional households and 22 additional people that would be exposed to 75 to 80 dB under the F-15EX 50 percent scenario.

Under the F-35A 5 percent scenario, a total of 3,680 households and 11,081 people would be exposed to CNEL of 65 to 70 dB, an increase of 3,541 households and 10,675 people. This increase would be due to the general increase in length and width of the 65 dB CNEL contour caused by the increase in operations and the greater noise generated by the F-35A on departures. Table 4-7 reflects an increase of 398 additional households and 1,236 people that would be exposed to 70 to 75 dB CNEL and 16 additional households and 43 additional people that would be exposed to 75 to 80 dB CNEL under the F-35A 5 percent scenario.

Under the F-35A 50 percent scenario, a total of 3,502 households and 10,599 people would be exposed to CNEL of 65 to 70 dB, an increase of 3,363 households and 10,193 people. This increase would be due to the general increase in length and width of the 65 dB CNEL contour caused by the increase in operations and the greater noise generated by the F-35A on departures. Table 4-7 reflects an increase of 387 additional households and 1,202 people that would be exposed to 70 to 75 dB CNEL and 17 additional households and 44 additional people that would be exposed to 75 to 80 dB CNEL under the F-35A 50 percent scenario.

Under the F-35A 95 percent scenario, a total of 3,326 households and 10,122 people would be exposed to CNEL of 65 to 70 dB, an increase of 3,187 households and 9,716 people. This increase would be due to the general increase in length and width of the 65 dB CNEL contour caused by the increase in operations and the greater noise generated by the F-35A on departures. Table 4-7 reflects an increase of 377 additional households and 1,172 people that would be exposed to 70 to 75 dB CNEL and 16 additional households and 43 additional people that would be exposed to 75 to 80 dB CNEL under the F-35A 95 percent scenario.

4.1.2.3 Classroom Learning Interference

Although classroom learning interference analysis only applies to the 24 school POIs, Table 4-8 presents $L_{eq(8hr)}$ for all 59 POIs because smaller daycare centers and learning facilities may exist at or near residential areas that may find the information useful. Under the two F-15EX scenarios, the number of school type POIs exposed to greater than 60 dB $L_{eq(8hr)}$ would be 13, an increase of 7 POI from existing conditions. Under the F-35A scenarios, the number of school type POIs exposed to greater than 60 dB $L_{eq(8hr)}$ for the 5 percent afterburner scenario would be 16 (an increase of 10 POIs), for the 50 percent afterburner scenario would be 9 POIs (an increase of 3 POIs), and for the 95 percent afterburner scenario would be 7 POIs (an increase of 1 POI).

Table 4-8 Classroom Screening Criteria ($L_{eq[8hr]}$) for POIs in the Vicinity of FAT

ID	*Location*	*Existing Conditions*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-C-01	Census Tract 45.03	55	52 (-3)	52 (-3)	58 (+3)	58 (+3)	57 (+2)
FR-C-02	Census Tract 54.10	59	58 (-1)	57 (-2)	**64 (+5)**	**64 (+5)**	**63 (+4)**
FR-C-03	Census Tract 54.03	59	**60 (+1)**	59 (0)	**65 (+6)**	**64 (+5)**	**64 (+5)**
FR-C-04	Census Tract 56.08	50	55 (+5)	55 (+5)	54 (+4)	54 (+4)	55 (+5)
FR-C-05	Census Tract 53.02	**62**	**62 (0)**	**61 (-1)**	**68 (+6)**	**67 (+5)**	**67 (+5)**
FR-C-06	Census Tract 53.04	59	**63 (+4)**	**62 (+3)**	**65 (+6)**	**65 (+6)**	**65 (+6)**
FR-C-07	Census Tract 31.02	55	**60 (+5)**	**60 (+5)**	57 (+2)	57 (+2)	57 (+2)
FR-C-08	Census Tract 53.01	**61**	**62 (+1)**	**61 (0)**	**67 (+6)**	**66 (+5)**	**66 (+5)**
FR-C-09	Census Tract 53.05	**64**	**69 (+5)**	**68 (+4)**	**71 (+7)**	**71 (+7)**	**71 (+7)**
FR-C-10	Census Tract 31.03	59	**64 (+5)**	**64 (+5)**	**62 (+3)**	**62 (+3)**	**62 (+3)**
FR-C-11	Census Tract 52.04	59	**62 (+3)**	**61 (+2)**	**65 (+6)**	**65 (+6)**	**65 (+6)**

ID	*Location*	*Existing Conditions*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-C-12	Census Tract 52.02	**67**	**74 (+7)**	**72 (+5)**	**75 (+8)**	**75 (+8)**	**75 (+8)**
FR-C-13	Census Tract 52.03	55	59 (+4)	59 (+4)	**61 (+6)**	**61 (+6)**	**61 (+6)**
FR-C-14	Census Tract 31.04	**72**	**78 (+6)**	**80 (+8)**	**77 (+5)**	**77 (+5)**	**77 (+5)**
FR-C-15	Census Tract 58.04	53	58 (+5)	**60 (+7)**	59 (+6)	59 (+6)	59 (+6)
FR-C-16	Census Tract 33.01	52	56 (+4)	56 (+4)	58 (+6)	58 (+6)	58 (+6)
FR-C-17	Census Tract 32.01	59	**64 (+5)**	**64 (+5)**	**65 (+6)**	**65 (+6)**	**65 (+6)**
FR-C-18	Census Tract 33.02	49	53 (+4)	53 (+4)	54 (+5)	54 (+5)	54 (+5)
FR-C-19	Census Tract 32.02	54	59 (+5)	**60 (+6)**	**60 (+6)**	**60 (+6)**	**60 (+6)**
FR-C-20	Census Tract 28	47	52 (+5)	53 (+6)	53 (+6)	53 (+6)	53 (+6)
FR-C-21	Census Tract 29.06	53	**60 (+7)**	**61 (+8)**	58 (+5)	59 (+6)	59 (+6)
FR-C-22	Census Tract 30.01	55	**60 (+5)**	**61 (+6)**	**60 (+5)**	**60 (+5)**	**60 (+5)**
FR-C-23	Census Tract 58.05	56	**61 (+5)**	**60 (+4)**	**63 (+7)**	**63 (+7)**	**63 (+7)**
FR-C-24	Census Tract 29.05	49	54 (+5)	55 (+6)	54 (+5)	54 (+5)	55 (+6)
FR-C-25	Census Tract 29.04	46	49 (+3)	50 (+4)	50 (+4)	51 (+5)	51 (+5)
FR-C-26	Census Tract 30.04	48	52 (+4)	53 (+5)	53 (+5)	53 (+5)	54 (+6)
FR-C-27	Census Tract 30.03	45	48 (+3)	49 (+4)	50 (+5)	50 (+5)	50 (+5)
FR-C-28	Census Tract 14.11	49	53 (+4)	53 (+4)	55 (+6)	55 (+6)	55 (+6)
FR-C-29	Census Tract 14.12	55	55 (0)	54 (-1)	**61 (+6)**	**61 (+6)**	**60 (+5)**
FR-C-30	Census Tract 59.04	51	50 (-1)	50 (-1)	57 (+6)	57 (+6)	57 (+6)
FR-H-01	Fresno VA Medical Center	47	50 (+3)	50 (+3)	52 (+5)	52 (+5)	52 (+5)
FR-H-02	Care Facilities Network	**69**	**74 (+5)**	**74 (+5)**	**75 (+6)**	**75 (+6)**	**75 (+6)**
FR-R-01	E. Gettysburg Avenue and N. Rowell Avenue	**63**	**66 (+3)**	**65 (+2)**	**70 (+7)**	**70 (+7)**	**70 (+7)**
FR-R-02	E. Simpson Avenue and N. Winery Avenue	**68**	**74 (+6)**	**74 (+6)**	**74 (+6)**	**74 (+6)**	**74 (+6)**
FR-R-03	E. Madison Avenue and N. Renn Avenue	55	58 (+3)	57 (+2)	**62 (+7)**	**62 (+7)**	**62 (+7)**
FR-S-01	Fresno Regional Occupational Program, Tioga Middle, and Wolter	**61**	**61 (0)**	**60 (-1)**	**66 (+5)**	**66 (+5)**	**66 (+5)**
FR-S-02	University High and California State	55	59 (+4)	59 (+4)	**62 (+7)**	**62 (+7)**	**62 (+7)**
FR-S-03	Truth Tabernacle Christian School	59	**60 (+1)**	**60 (+1)**	**65 (+6)**	**65 (+6)**	**64 (+5)**
FR-S-04	Thomas Elementary	**63**	**64 (+1)**	**63 (0)**	**69 (+6)**	**69 (+6)**	**69 (+6)**
FR-S-05	Vinland Elementary	**61**	**65 (+4)**	**64 (+3)**	**67 (+6)**	**67 (+6)**	**67 (+6)**
FR-S-06	College Community (Economic Opportunities Commission) Head Start Community College	58	**63 (+5)**	**63 (+5)**	**61 (+3)**	**61 (+3)**	**61 (+3)**
FR-S-07	Tarpey Elementary	55	59 (+4)	**60 (+5)**	57 (+2)	57 (+2)	57 (+2)
FR-S-08	Maverick Prep Private School for Gif	55	58 (+3)	58 (+3)	**61 (+6)**	**61 (+6)**	**61 (+6)**
FR-S-09	Viking Elementary and Fresno Unified School District-Viking Childcare	**65**	**70 (+5)**	**70 (+5)**	**69 (+4)**	**69 (+4)**	**69 (+4)**
FR-S-10	Miramonte Elementary	48	53 (+5)	54 (+6)	55 (+7)	55 (+7)	55 (+7)
FR-S-11	Carter G. Woodson Public Charter and Learn Academy	52	56 (+4)	56 (+4)	58 (+6)	58 (+6)	58 (+6)
FR-S-12	Centennial Elementary, Dakota Circle (Economic Opportunities Commission), and Erma Duncan Polytechnical High	**60**	**64 (+4)**	**63 (+3)**	**66 (+6)**	**66 (+6)**	**66 (+6)**
FR-S-13	Irwin O. Addicott Elementary and Scandinavian Middle	**66**	**71 (+5)**	**71 (+5)**	**72 (+6)**	**72 (+6)**	**72 (+6)**
FR-S-14	Roger S. Oraze Elementary	45	49 (+4)	49 (+4)	53 (+8)	53 (+8)	53 (+8)
FR-S-15	McLane High	54	59 (+5)	59 (+5)	**60 (+6)**	**60 (+6)**	**60 (+6)**
FR-S-16	Cup Large Day Care Center	56	**62 (+6)**	**63 (+7)**	**61 (+5)**	**62 (+6)**	**62 (+6)**
FR-S-17	Ericson Elementary	57	**63 (+6)**	**64 (+7)**	**63 (+6)**	**63 (+6)**	**63 (+6)**

ID	*Location*	*Existing Conditions*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-S-18	Sierra Charter and Violet Heintz Education Academy	59	**66 (+7)**	**67 (+8)**	**65 (+6)**	**65 (+6)**	**65 (+6)**
FR-S-19	Virginia R. Boris Elementary	48	51 (+3)	51 (+3)	57 (+9)	57 (+9)	57 (+9)
FR-S-20	Ewing Elementary and Remnant Christian School	50	55 (+5)	56 (+6)	55 (+5)	55 (+5)	56 (+6)
FR-S-21	Fresno Adventist Academy	56	**61 (+5)**	**63 (+7)**	**61 (+5)**	**61 (+5)**	**61 (+5)**
FR-S-22	Temperance-Kutner Elementary	56	58 (+2)	57 (+1)	**65 (+9)**	**65 (+9)**	**64 (+8)**
FR-S-23	Molly S. Bakman Elementary and Turner Elementary	49	53 (+4)	54 (+5)	54 (+5)	55 (+6)	55 (+6)
FR-S-24	Fancher Creek Elementary	51	54 (+3)	53 (+2)	57 (+6)	57 (+6)	57 (+6)
Number of School POI greater than 60 dB $L_{eq(8hr)}$		14	29	31	36	36	36

Note: [1]Global for table: assumes 90 percent of ANG daytime operations occur during the school day; Windows open condition with Noise Level Reduction of 15 dB due to building attenuation.
[2]Parenthetical number represents the change to $L_{eq(8hr)}$ relative to existing conditions.

Legend: AB = afterburner; dB = decibel; FAT = Fresno Yosemite International Airport; ID = Identification; $L_{eq(8hr)}$ = 8-hour Equivalent; POI = Point of Interest.

Table 4-9 presents the average number of speech interfering events per school day hour from FAT aircraft operations. The F-15EX 15 percent scenario would result in 1 additional event per hour at 4 school POIs and the F-15EX 50 percent scenario an increase by 1 event per hour at 5 school POIs while all remaining POIs would not change. All three F-35A scenarios would result in 1 additional event per hour at 11 school POIs and no change at the remaining 13 school POIs.

Table 4-9 Classroom Speech Interfering Events per School Day Hour in the Vicinity of FAT

ID	*Location*	*Existing Conditions*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-C-01	Census Tract 45.03	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-C-02	Census Tract 54.10	4	2 (0)	2 (0)	2 (0)	2 (0)	2 (0)
FR-C-03	Census Tract 54.03	1	2 (0)	2 (0)	2 (0)	2 (0)	2 (0)
FR-C-04	Census Tract 56.08	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-C-05	Census Tract 53.02	3	4 (0)	4 (0)	4 (0)	4 (0)	4 (0)
FR-C-06	Census Tract 53.04	3	2 (+1)	2 (+1)	2 (+1)	2 (+1)	2 (+1)
FR-C-07	Census Tract 31.02	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-C-08	Census Tract 53.01	1	3 (0)	3 (0)	3 (0)	3 (0)	3 (0)
FR-C-09	Census Tract 53.05	5	4 (+1)	4 (+1)	4 (+1)	4 (+1)	4 (+1)
FR-C-10	Census Tract 31.03	1	2 (+1)	2 (+1)	2 (+1)	2 (+1)	2 (+1)
FR-C-11	Census Tract 52.04	6	2 (+1)	2 (+1)	2 (+1)	2 (+1)	2 (+1)
FR-C-12	Census Tract 52.02	1	6 (+1)	6 (+1)	6 (+1)	6 (+1)	6 (+1)
FR-C-13	Census Tract 52.03	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-C-14	Census Tract 31.04	1	7 (+1)	7 (+1)	7 (+1)	7 (+1)	7 (+1)
FR-C-15	Census Tract 58.04	1	1 (0)	1 (0)	2 (+1)	2 (+1)	2 (+1)
FR-C-16	Census Tract 33.01	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-C-17	Census Tract 32.01	1	2 (+1)	2 (+1)	2 (+1)	2 (+1)	2 (+1)
FR-C-18	Census Tract 33.02	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-C-19	Census Tract 32.02	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-C-20	Census Tract 28	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-C-21	Census Tract 29.06	1	1 (0)	1 (0)	2 (+1)	2 (+1)	2 (+1)
FR-C-22	Census Tract 30.01	1	2 (+1)	2 (+1)	2 (+1)	2 (+1)	2 (+1)
FR-C-23	Census Tract 58.05	1	2 (+1)	2 (+1)	2 (+1)	2 (+1)	2 (+1)
FR-C-24	Census Tract 29.05	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-C-25	Census Tract 29.04	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)

ID	*Location*	*Existing Conditions*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-C-26	Census Tract 30.04	3	1 (0)	1 (0)	2 (+1)	2 (+1)	2 (+1)
FR-C-27	Census Tract 30.03	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-C-28	Census Tract 14.11	1	1 (0)	1 (0)	2 (+1)	2 (+1)	2 (+1)
FR-C-29	Census Tract 14.12	5	3 (0)	4 (+1)	3 (0)	3 (0)	3 (0)
FR-C-30	Census Tract 59.04	4	2 (+1)	2 (+1)	2 (+1)	2 (+1)	2 (+1)
FR-H-01	Fresno VA Medical Center	6	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-H-02	Care Facilities Network	2	6 (+1)	6 (+1)	6 (+1)	6 (+1)	6 (+1)
FR-R-01	E. Gettysburg Avenue and N. Rowell Avenue	3	4 (0)	4 (0)	4 (0)	4 (0)	4 (0)
FR-R-02	E. Simpson Avenue and N. Winery Avenue	1	6 (0)	6 (0)	7 (+1)	7 (+1)	7 (+1)
FR-R-03	E. Madison Avenue and N. Renn Avenue	2	2 (0)	2 (0)	2 (0)	2 (0)	2 (0)
FR-S-01	Fresno Regional Occupational Program, Tioga Middle, and Wolter	4	3 (0)	4 (+1)	3 (0)	3 (0)	3 (0)
FR-S-02	University High and California State	2	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-S-03	Truth Tabernacle Christian School	1	2 (0)	2 (0)	2 (0)	2 (0)	2 (0)
FR-S-04	Thomas Elementary	1	5 (+1)	5 (+1)	5 (+1)	5 (+1)	5 (+1)
FR-S-05	Vinland Elementary	1	2 (0)	2 (0)	2 (0)	2 (0)	2 (0)
FR-S-06	College Community (Economic Opportunities Commission) Head Start Community College	2	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-S-07	Tarpey Elementary	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-S-08	Maverick Prep Private School for Gif	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-S-09	Viking Elementary and Fresno Unified School District-Viking Childcare	2	3 (+1)	3 (+1)	3 (+1)	3 (+1)	3 (+1)
FR-S-10	Miramonte Elementary	5	1 (0)	1 (0)	2 (+1)	2 (+1)	2 (+1)
FR-S-11	Carter G. Woodson Public Charter and Learn Academy	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-S-12	Centennial Elementary, Dakota Circle (Economic Opportunities Commission), and Erma Duncan Polytechnical High	1	2 (0)	2 (0)	2 (0)	2 (0)	2 (0)
FR-S-13	Irwin O. Addicott Elementary and Scandinavian Middle	1	5 (0)	5 (0)	5 (0)	5 (0)	5 (0)
FR-S-14	Roger S. Oraze Elementary	1	1 (0)	1 (0)	2 (+1)	2 (+1)	2 (+1)
FR-S-15	McLane High	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-S-16	Cup Large Day Care Center	1	2 (+1)	2 (+1)	2 (+1)	2 (+1)	2 (+1)
FR-S-17	Ericson Elementary	1	1 (0)	1 (0)	2 (+1)	2 (+1)	2 (+1)
FR-S-18	Sierra Charter and Violet Heintz Education Academy	2	1 (0)	1 (0)	2 (+1)	2 (+1)	2 (+1)
FR-S-19	Virginia R. Boris Elementary	2	1 (0)	1 (0)	2 (+1)	2 (+1)	2 (+1)
FR-S-20	Ewing Elementary and Remnant Christian School	1	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)
FR-S-21	Fresno Adventist Academy	1	3 (+1)	3 (+1)	3 (+1)	3 (+1)	3 (+1)
FR-S-22	Temperance-Kutner Elementary	1	2 (0)	2 (0)	2 (0)	2 (0)	2 (0)
FR-S-23	Molly S. Bakman Elementary and Turner Elementary	4	1 (0)	1 (0)	2 (+1)	2 (+1)	2 (+1)
FR-S-24	Fancher Creek Elementary	1	1 (0)	1 (0)	2 (+1)	2 (+1)	2 (+1)

Note: [1]Assumes 90 percent of ANG daytime operations occur during the school day;
Windows open condition with Noise Level Reduction of 15 dB due to building attenuation
[2]Parenthetical number represents the change to average number of classroom speech interfering events per hour relative to existing conditions.

Legend: AB = afterburner; FAT = Fresno Yosemite International Airport; ID = Identification.

Table 4-10 presents the estimated time in minutes during an average school day that interior noise levels would be above an interior level of 50 dB. Under the F-15EX 15 percent scenario, 5 school POIs would experience either a decrease or no change to time above and 19 would experience an increase ranging from 1 to 3 additional minutes per average day. Under the F-15EX 50 percent scenario, 2 school POIs would experience no change to time above and 22 would experience an increase ranging from 1 to 5 additional minutes per average day. Under all three F-35A scenarios, 1 school POI would experience either no change or a decrease to time above and 23 school POIs would experience an increase ranging from 1 to 6 additional minutes per average day.

Table 4-10 Classroom Time Above Interior 50 dB during 8-hour School Day in the Vicinity of FAT

ID	*Location*	*Existing Conditions*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-C-01	Census Tract 45.03	6	5 (-1)	5 (-1)	6 (0)	7 (+1)	8 (+2)
FR-C-02	Census Tract 54.10	6	6 (0)	5 (-1)	8 (+2)	9 (+3)	10 (+4)
FR-C-03	Census Tract 54.03	5	6 (+1)	5 (0)	7 (+2)	8 (+3)	10 (+5)
FR-C-04	Census Tract 56.08	2	3 (+1)	5 (+3)	6 (+4)	7 (+5)	8 (+6)
FR-C-05	Census Tract 53.02	8	9 (+1)	8 (0)	10 (+2)	11 (+3)	13 (+5)
FR-C-06	Census Tract 53.04	3	4 (+1)	4 (+1)	7 (+4)	8 (+5)	9 (+6)
FR-C-07	Census Tract 31.02	2	4 (+2)	5 (+3)	6 (+4)	5 (+3)	4 (+2)
FR-C-08	Census Tract 53.01	6	5 (-1)	6 (0)	8 (+2)	10 (+4)	11 (+5)
FR-C-09	Census Tract 53.05	6	7 (+1)	7 (+1)	10 (+4)	11 (+5)	12 (+6)
FR-C-10	Census Tract 31.03	3	4 (+1)	6 (+3)	6 (+3)	5 (+2)	4 (+1)
FR-C-11	Census Tract 52.04	3	4 (+1)	4 (+1)	7 (+4)	8 (+5)	9 (+6)
FR-C-12	Census Tract 52.02	10	11 (+1)	11 (+1)	14 (+4)	15 (+5)	16 (+6)
FR-C-13	Census Tract 52.03	2	3 (+1)	4 (+2)	6 (+4)	7 (+5)	8 (+6)
FR-C-14	Census Tract 31.04	10	13 (+3)	14 (+4)	11 (+1)	11 (+1)	11 (+1)
FR-C-15	Census Tract 58.04	2	5 (+3)	6 (+4)	4 (+2)	5 (+3)	5 (+3)
FR-C-16	Census Tract 33.01	2	3 (+1)	4 (+2)	5 (+3)	7 (+5)	8 (+6)
FR-C-17	Census Tract 32.01	3	5 (+2)	7 (+4)	7 (+4)	6 (+3)	5 (+2)
FR-C-18	Census Tract 33.02	2	3 (+1)	4 (+2)	5 (+3)	7 (+5)	8 (+6)
FR-C-19	Census Tract 32.02	2	4 (+2)	5 (+3)	6 (+4)	5 (+3)	4 (+2)
FR-C-20	Census Tract 28	2	4 (+2)	5 (+3)	6 (+4)	4 (+2)	3 (+1)
FR-C-21	Census Tract 29.06	3	4 (+1)	5 (+2)	8 (+5)	6 (+3)	3 (0)
FR-C-22	Census Tract 30.01	2	6 (+4)	8 (+6)	5 (+3)	7 (+5)	8 (+6)
FR-C-23	Census Tract 58.05	2	3 (+1)	3 (+1)	5 (+3)	6 (+4)	6 (+4)
FR-C-24	Census Tract 29.05	3	4 (+1)	5 (+2)	6 (+3)	5 (+2)	3 (0)
FR-C-25	Census Tract 29.04	2	3 (+1)	5 (+3)	5 (+3)	4 (+2)	3 (+1)
FR-C-26	Census Tract 30.04	1	2 (+1)	4 (+3)	3 (+2)	5 (+4)	6 (+5)
FR-C-27	Census Tract 30.03	0	1 (+1)	2 (+2)	1 (+1)	2 (+2)	4 (+4)
FR-C-28	Census Tract 14.11	1	1 (0)	1 (0)	4 (+3)	4 (+3)	4 (+3)
FR-C-29	Census Tract 14.12	3	4 (+1)	4 (+1)	6 (+3)	6 (+3)	6 (+3)
FR-C-30	Census Tract 59.04	2	3 (+1)	2 (0)	4 (+2)	4 (+2)	5 (+3)
FR-H-01	Fresno VA Medical Center	2	3 (+1)	3 (+1)	5 (+3)	6 (+4)	8 (+6)
FR-H-02	Care Facilities Network	10	13 (+3)	15 (+5)	10 (0)	11 (+1)	11 (+1)
FR-R-01	E. Gettysburg Avenue and N. Rowell Avenue	6	7 (+1)	7 (+1)	10 (+4)	11 (+5)	12 (+6)
FR-R-02	E. Simpson Avenue and N. Winery Avenue	12	15 (+3)	17 (+5)	12 (0)	13 (+1)	14 (+2)
FR-R-03	E. Madison Avenue and N. Renn Avenue	2	2 (0)	3 (+1)	6 (+4)	6 (+4)	6 (+4)
FR-S-01	Fresno Regional Occupational Program, Tioga Middle, and Wolter	6	7 (+1)	7 (+1)	9 (+3)	10 (+4)	11 (+5)

ID	*Location*	*Existing Conditions*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-S-02	University High and California State	2	3 (+1)	3 (+1)	6 (+4)	7 (+5)	8 (+6)
FR-S-03	Truth Tabernacle Christian School	5	6 (+1)	6 (+1)	7 (+2)	8 (+3)	10 (+5)
FR-S-04	Thomas Elementary	8	8 (0)	9 (+1)	11 (+3)	12 (+4)	14 (+6)
FR-S-05	Vinland Elementary	3	4 (+1)	5 (+2)	7 (+4)	8 (+5)	9 (+6)
FR-S-06	College Community (Economic Opportunities Commission) Head Start Community College	2	3 (+1)	5 (+3)	6 (+4)	7 (+5)	8 (+6)
FR-S-07	Tarpey Elementary	3	4 (+1)	5 (+2)	7 (+4)	5 (+2)	4 (+1)
FR-S-08	Maverick Prep Private School for Gif	3	3 (0)	4 (+1)	6 (+3)	7 (+4)	8 (+5)
FR-S-09	Viking Elementary and Fresno Unified School District-Viking Childcare	5	7 (+2)	9 (+4)	8 (+3)	7 (+2)	6 (+1)
FR-S-10	Miramonte Elementary	2	4 (+2)	5 (+3)	6 (+4)	6 (+4)	5 (+3)
FR-S-11	Carter G. Woodson Public Charter and Learn Academy	2	3 (+1)	3 (+1)	5 (+3)	7 (+5)	8 (+6)
FR-S-12	Centennial Elementary, Dakota Circle (Economic Opportunities Commission), and Erma Duncan Polytechnical High	4	4 (0)	5 (+1)	7 (+3)	9 (+5)	10 (+6)
FR-S-13	Irwin O. Addicott Elementary and Scandinavian Middle	9	12 (+3)	14 (+5)	13 (+4)	12 (+3)	10 (+1)
FR-S-14	Roger S. Oraze Elementary	0	1 (+1)	3 (+3)	2 (+2)	4 (+4)	5 (+5)
FR-S-15	McLane High	2	3 (+1)	5 (+3)	6 (+4)	7 (+5)	8 (+6)
FR-S-16	Cup Large Day Care Center	2	5 (+3)	7 (+5)	7 (+5)	7 (+5)	8 (+6)
FR-S-17	Ericson Elementary	3	4 (+1)	6 (+3)	7 (+4)	5 (+2)	4 (+1)
FR-S-18	Sierra Charter and Violet Heintz Education Academy	3	4 (+1)	6 (+3)	2 (-1)	3 (0)	4 (+1)
FR-S-19	Virginia R. Boris Elementary	1	1 (0)	1 (0)	2 (+1)	2 (+1)	2 (+1)
FR-S-20	Ewing Elementary and Remnant Christian School	3	4 (+1)	5 (+2)	7 (+4)	5 (+2)	3 (0)
FR-S-21	Fresno Adventist Academy	3	6 (+3)	8 (+5)	7 (+4)	8 (+5)	9 (+6)
FR-S-22	Temperance-Kutner Elementary	2	3 (+1)	3 (+1)	5 (+3)	5 (+3)	5 (+3)
FR-S-23	Molly S. Bakman Elementary and Turner Elementary	2	3 (+1)	5 (+3)	5 (+3)	4 (+2)	4 (+2)
FR-S-24	Fancher Creek Elementary	1	1 (0)	1 (0)	4 (+3)	4 (+3)	4 (+3)

Note: [1]Assumes 90 percent of ANG daytime operations occur during the school day;
Windows open condition with Noise Level Reduction of 15 dB due to building attenuation
[2]Parenthetical number represents the change to time above 50 dB, in minutes, relative to existing conditions.
Legend: AB = afterburner; dB = decibel; FAT = Fresno Yosemite International Airport; ID = Identification.

4.1.2.4 Non-school Speech Interference

Table 4-11 details the number of speech interfering events during the CNEL daytime (7 a.m. to 7 p.m. [0700 to 1900]) per average day for both windows open and windows closed conditions. Under the F-15EX 15 percent scenario, the number of daytime events would range from 1 to 5 for windows open. With windows closed, 13 POIs would experience no interfering events and the remaining POIs would experience interfering events ranging from 1 to 2 per average hour. Under the F-15EX 50 percent scenario, the number of daytime events would range from 1 to 2 for windows open. With windows closed, 14 POIs would experience no interfering events and the remaining POIs would experience interfering events ranging from 1 to 2 per average hour.

Table 4-11 Non-School Speech Interfering Events per Day During CNEL Daytime in the Vicinity of FAT

ID	*Location*	*Existing Conditions*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-C-01	Census Tract 45.03	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-02	Census Tract 54.10	2 / 0	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
FR-C-03	Census Tract 54.03	1 / 0	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
FR-C-04	Census Tract 56.08	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-05	Census Tract 53.02	3 / 1	3 / 1	3 / 1	3 / 1	3 / 1	3 / 1
FR-C-06	Census Tract 53.04	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-07	Census Tract 31.02	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-08	Census Tract 53.01	2 / 0	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
FR-C-09	Census Tract 53.05	2 / 1	3 / 1	3 / 1	3 / 1	3 / 1	3 / 1
FR-C-10	Census Tract 31.03	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-11	Census Tract 52.04	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-12	Census Tract 52.02	4 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
FR-C-13	Census Tract 52.03	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-14	Census Tract 31.04	5 / 2	5 / 2	5 / 2	5 / 2	5 / 2	5 / 2
FR-C-15	Census Tract 58.04	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-16	Census Tract 33.01	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-17	Census Tract 32.01	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-18	Census Tract 33.02	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-19	Census Tract 32.02	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-20	Census Tract 28	0 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-21	Census Tract 29.06	0 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-22	Census Tract 30.01	1 / 0	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
FR-C-23	Census Tract 58.05	1 / 0	1 / 0	1 / 0	1 / 1	1 / 1	1 / 1
FR-C-24	Census Tract 29.05	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-C-25	Census Tract 29.04	0 / 0	1 / 0	1 / 0	1 / 0	1 / 0	1 / 1
FR-C-26	Census Tract 30.04	1 / 0	1 / 0	1 / 0	1 / 0	1 / 0	1 / 1
FR-C-27	Census Tract 30.03	0 / 0	1 / 0	1 / 0	1 / 0	1 / 0	1 / 0
FR-C-28	Census Tract 14.11	1 / 0	1 / 0	1 / 0	1 / 0	1 / 0	1 / 0
FR-C-29	Census Tract 14.12	2 / 0	2 / 0	3 / 0	3 / 1	3 / 1	3 / 1
FR-C-30	Census Tract 59.04	1 / 0	1 / 0	1 / 0	1 / 1	1 / 1	1 / 1
FR-H-01	Fresno VA Medical Center	0 / 0	1 / 1	1 / 0	1 / 1	1 / 1	1 / 1
FR-H-02	Care Facilities Network	4 / 1	4 / 1	4 / 1	4 / 2	4 / 2	4 / 2
FR-R-01	E. Gettysburg Avenue and N. Rowell Avenue	3 / 1	3 / 1	3 / 1	3 / 1	3 / 1	3 / 1
FR-R-02	E. Simpson Avenue and N. Winery Avenue	4 / 1	5 / 2	5 / 2	5 / 2	5 / 2	5 / 2
FR-R-03	E. Madison Avenue and N. Renn Avenue	1 / 0	2 / 0	2 / 0	2 / 1	2 / 1	2 / 1
FR-S-01	Fresno Regional Occupational Program, Tioga Middle, and Wolter	2 / 1	3 / 1	3 / 1	3 / 1	3 / 1	3 / 1
FR-S-02	University High and California State	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-S-03	Truth Tabernacle Christian School	1 / 0	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
FR-S-04	Thomas Elementary	3 / 1	4 / 1	4 / 1	4 / 1	4 / 1	4 / 1
FR-S-05	Vinland Elementary	1 / 0	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
FR-S-06	College Community (Economic Opportunities Commission) Head Start Community College	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-S-07	Tarpey Elementary	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-S-08	Maverick Prep Private School for Gif	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1

ID	*Location*	*Existing Conditions*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-S-09	Viking Elementary and Fresno Unified School District-Viking Childcare	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
FR-S-10	Miramonte Elementary	1 / 0	1 / 0	1 / 0	1 / 1	1 / 1	1 / 1
FR-S-11	Carter G. Woodson Public Charter and Learn Academy	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-S-12	Centennial Elementary, Dakota Circle (Economic Opportunities Commission), and Erma Duncan Polytechnical High	1 / 0	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
FR-S-13	Irwin O. Addicott Elementary and Scandinavian Middle	3 / 1	4 / 1	4 / 1	4 / 1	4 / 1	4 / 1
FR-S-14	Roger S. Oraze Elementary	0 / 0	1 / 0	1 / 0	1 / 1	1 / 1	1 / 1
FR-S-15	McLane High	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-S-16	Cup Large Day Care Center	1 / 0	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
FR-S-17	Ericson Elementary	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-S-18	Sierra Charter and Violet Heintz Education Academy	1 / 0	1 / 1	1 / 1	2 / 1	2 / 1	2 / 1
FR-S-19	Virginia R. Boris Elementary	1 / 0	1 / 0	1 / 0	1 / 1	1 / 1	1 / 1
FR-S-20	Ewing Elementary and Remnant Christian School	1 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
FR-S-21	Fresno Adventist Academy	1 / 0	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
FR-S-22	Temperance-Kutner Elementary	1 / 0	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
FR-S-23	Molly S. Bakman Elementary and Turner Elementary	0 / 0	1 / 0	1 / 0	1 / 1	1 / 1	1 / 1
FR-S-24	Fancher Creek Elementary	1 / 0	1 / 0	1 / 0	1 / 0	1 / 0	1 / 0

Note: [1]Values represent events for conditions with windows open / windows closed.
Legend: AB = afterburner; CNEL = Community Noise Equivalent Level; FAT = Fresno Yosemite International Airport; ID = Identification.

Under the F-35A 5 percent scenario, the number of daytime events would range from 1 to 5 for windows open. With windows closed, 5 POIs would experience no interfering events and the remaining POIs would experience interfering events ranging from 1 to 2 per average hour. Under the F-35A 50 percent scenario, the number of daytime events would range from 1 to 5 for windows open. With windows closed, 5 POIs would experience no interfering events and the remaining POIs would experience interfering events ranging from 1 to 2 per average hour. Under the F-35A 95 percent scenario, the number of daytime events would range from 1 to 5 for windows open. With windows closed, 3 POIs would experience no interfering events and the remaining POIs would experience interfering events ranging from 1 to 2 per average hour.

4.1.2.5 Probability of Awakening

Table 4-12 presents the existing conditions estimated PA and the change that would occur under each of the proposed scenarios. The F-15EX 15 percent scenario would result in a 1 percent increase in PA at 6 POIs for windows open and 4 POIs for windows closed. The F-15EX 50 percent scenario would result in a 1 percent increase in PA at 8 POIs for windows open and 4 POIs for windows closed. All three F-35A scenarios would result in a 1 percent increase in PA at 33 POIs for windows open and 9 POIs for windows closed. The generally small amount of increase in PA would be due to the small percent of 144 FW aircraft that would operate during the CNEL nighttime.

Table 4-12 Estimated Change to Probability of Awakening Relative to Existing Conditions in the Vicinity of FAT

ID	*Location*	*Existing Conditions PA*	*Change Relative to Existing Conditions*				
			F-15EX 15% AB	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-C-01	Census Tract 45.03	<1% / <1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-C-02	Census Tract 54.10	1% / 1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-C-03	Census Tract 54.03	1% / 1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-C-04	Census Tract 56.08	<1% / <1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-C-05	Census Tract 53.02	5% / 4%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-C-06	Census Tract 53.04	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-C-07	Census Tract 31.02	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-C-08	Census Tract 53.01	3% / 2%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-C-09	Census Tract 53.05	4% / 3%	+1 / 0	+1 / 0	+1 / 0	+1 / 0	+1 / 0
FR-C-10	Census Tract 31.03	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-C-11	Census Tract 52.04	1% / <1%	0 / +1	0 / +1	0 / +1	0 / +1	0 / +1
FR-C-12	Census Tract 52.02	14% / 9%	0 / 0	0 / 0	+1 / +1	+1 / +1	+1 / +1
FR-C-13	Census Tract 52.03	1% / <1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-C-14	Census Tract 31.04	30% / 20%	0 / 0	0 / 0	0 / +1	0 / +1	0 / +1
FR-C-15	Census Tract 58.04	<1% / <1%	+1 / 0	+1 / 0	+1 / +1	+1 / +1	+1 / +1
FR-C-16	Census Tract 33.01	1% / <1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-C-17	Census Tract 32.01	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-C-18	Census Tract 33.02	1% / <1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-C-19	Census Tract 32.02	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-C-20	Census Tract 28	<1% / <1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-C-21	Census Tract 29.06	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-C-22	Census Tract 30.01	<1% / <1%	0 / 0	+1 / 0	+1 / 0	+1 / 0	+1 / 0
FR-C-23	Census Tract 58.05	<1% / <1%	+1 / 0	+1 / 0	+1 / +1	+1 / +1	+1 / +1
FR-C-24	Census Tract 29.05	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-C-25	Census Tract 29.04	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-C-26	Census Tract 30.04	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-C-27	Census Tract 30.03	<1% / <1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-C-28	Census Tract 14.11	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-C-29	Census Tract 14.12	1% / <1%	0 / +1	0 / +1	0 / +1	0 / +1	0 / +1
FR-C-30	Census Tract 59.04	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-H-01	Fresno VA Medical Center	<1% / <1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-H-02	Care Facilities Network	11% / 7%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-R-01	E. Gettysburg Avenue and N. Rowell Avenue	6% / 4%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-R-02	E. Simpson Avenue and N. Winery Avenue	20% / 13%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-R-03	E. Madison Avenue and N. Renn Avenue	1% / 1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-S-01	Fresno Regional Occupational Program, Tioga Middle, and Wolter	3% / 2%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-S-02	University High and California State	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-S-03	Truth Tabernacle Christian School	2% / 1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-S-04	Thomas Elementary	7% / 5%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-S-05	Vinland Elementary	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-S-06	College Community (Economic Opportunities Commission) Head Start Community College	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-S-07	Tarpey Elementary	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-S-08	Maverick Prep Private School for Gif	<1% / <1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0

ID	*Location*	*Existing Conditions PA*	*Change Relative to Existing Conditions*				
			F-15EX 15% AB	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-S-09	Viking Elementary and Fresno Unified School District-Viking Childcare	<1% / <1%	+1 / 0	+1 / 0	+1 / 0	+1 / 0	+1 / 0
FR-S-10	Miramonte Elementary	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-S-11	Carter G. Woodson Public Charter and Learn Academy	1% / <1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-S-12	Centennial Elementary, Dakota Circle (Economic Opportunities Commission), and Erma Duncan Polytechnical High	1% / <1%	0 / +1	0 / +1	0 / +1	0 / +1	0 / +1
FR-S-13	Irwin O. Addicott Elementary and Scandinavian Middle	9% / 6%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-S-14	Roger S. Oraze Elementary	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-S-15	McLane High	<1% / <1%	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
FR-S-16	Cup Large Day Care Center	<1% / <1%	+1 / 0	+1 / 0	+1 / +1	+1 / +1	+1 / +1
FR-S-17	Ericson Elementary	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-S-18	Sierra Charter and Violet Heintz Education Academy	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-S-19	Virginia R. Boris Elementary	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-S-20	Ewing Elementary and Remnant Christian School	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-S-21	Fresno Adventist Academy	<1% / <1%	0 / 0	+1 / 0	+1 / 0	+1 / 0	+1 / 0
FR-S-22	Temperance-Kutner Elementary	1% / <1%	0 / +1	0 / +1	0 / +1	0 / +1	0 / +1
FR-S-23	Molly S. Bakman Elementary and Turner Elementary	<1% / <1%	0 / 0	0 / 0	+1 / 0	+1 / 0	+1 / 0
FR-S-24	Fancher Creek Elementary	<1% / <1%	+1 / 0	+1 / 0	+1 / 0	+1 / 0	+1 / 0
POI with no change			53 / 55	51 / 55	26 / 50	26 / 50	26 / 50
POI with increase of 1 percent or greater			6 / 4	8 / 4	33 / 9	33 / 9	33 / 9

Notes: [1]Non-residential POIs included because residential areas are often located nearby other noise sensitive areas for which these results would apply.
[2]Assumes 15 dB Noise Level Reduction.
[3]Assumes 25 dB Noise Level Reduction.

Legend: < = less than; AB = afterburner; FAT = Fresno Yosemite International Airport; ID = Identification; POI = Point of Interest.

4.1.2.6 Potential for Hearing Loss

Each of the proposed scenarios would result in off-airport acreage exposed to 80 dB CNEL, the screening threshold for PHL. Therefore, Figures 4-12 through 4-16 present $L_{eq(24hr)}$ for each proposed scenario in 1 dB increments for areas within the 80 dB CNEL screening area and outside of airport property to determine if any residents or people would be at risk of hearing loss. In each of the F-15EX and F-35A scenarios, the 80 dB CNEL contours (and various levels of $L_{eq[24hr]}$) would not extend to noise sensitive areas outside of the airport property.

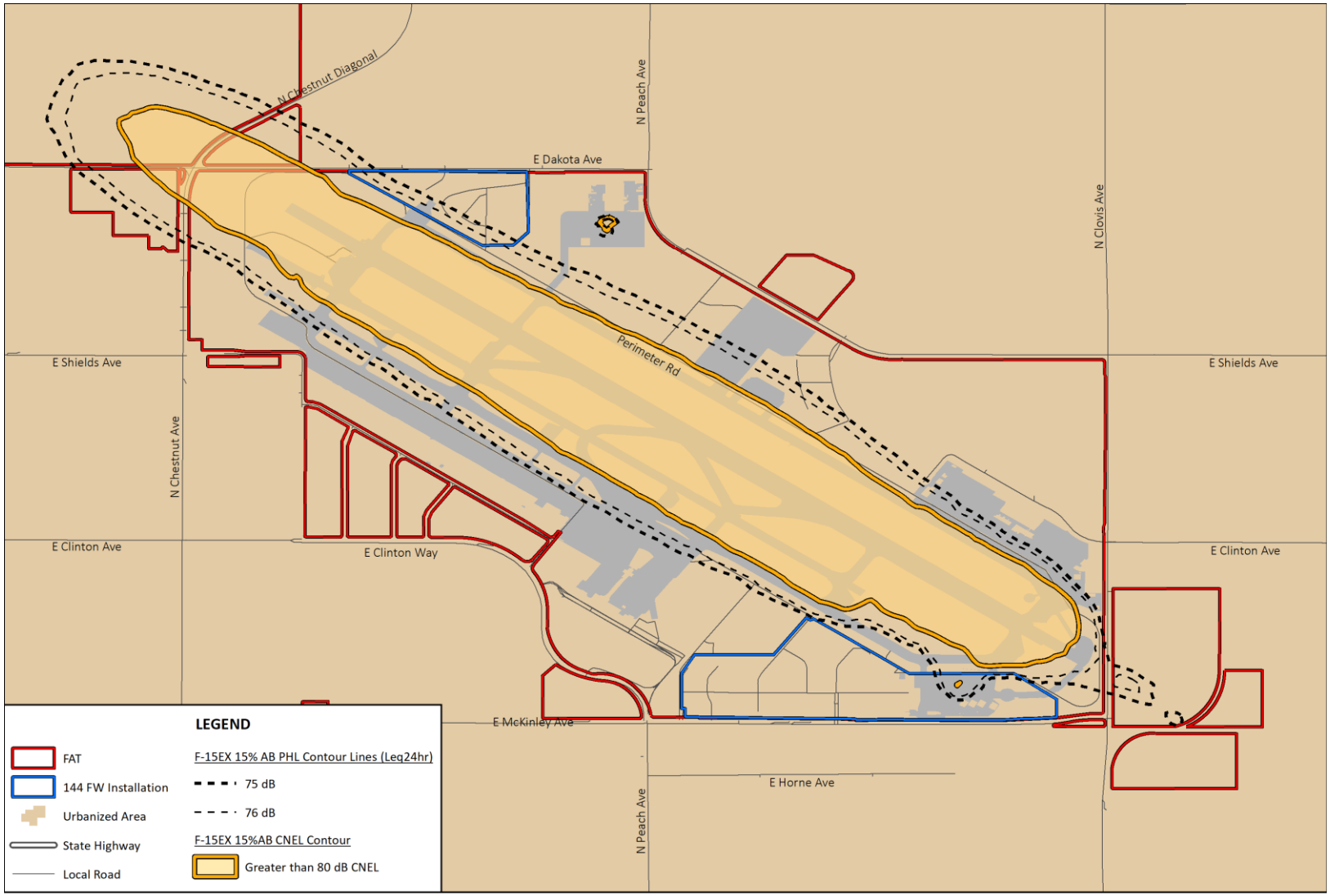

Figure 4-12 F-15EX 15 Percent Afterburner Scenario – Potential for Hearing Loss

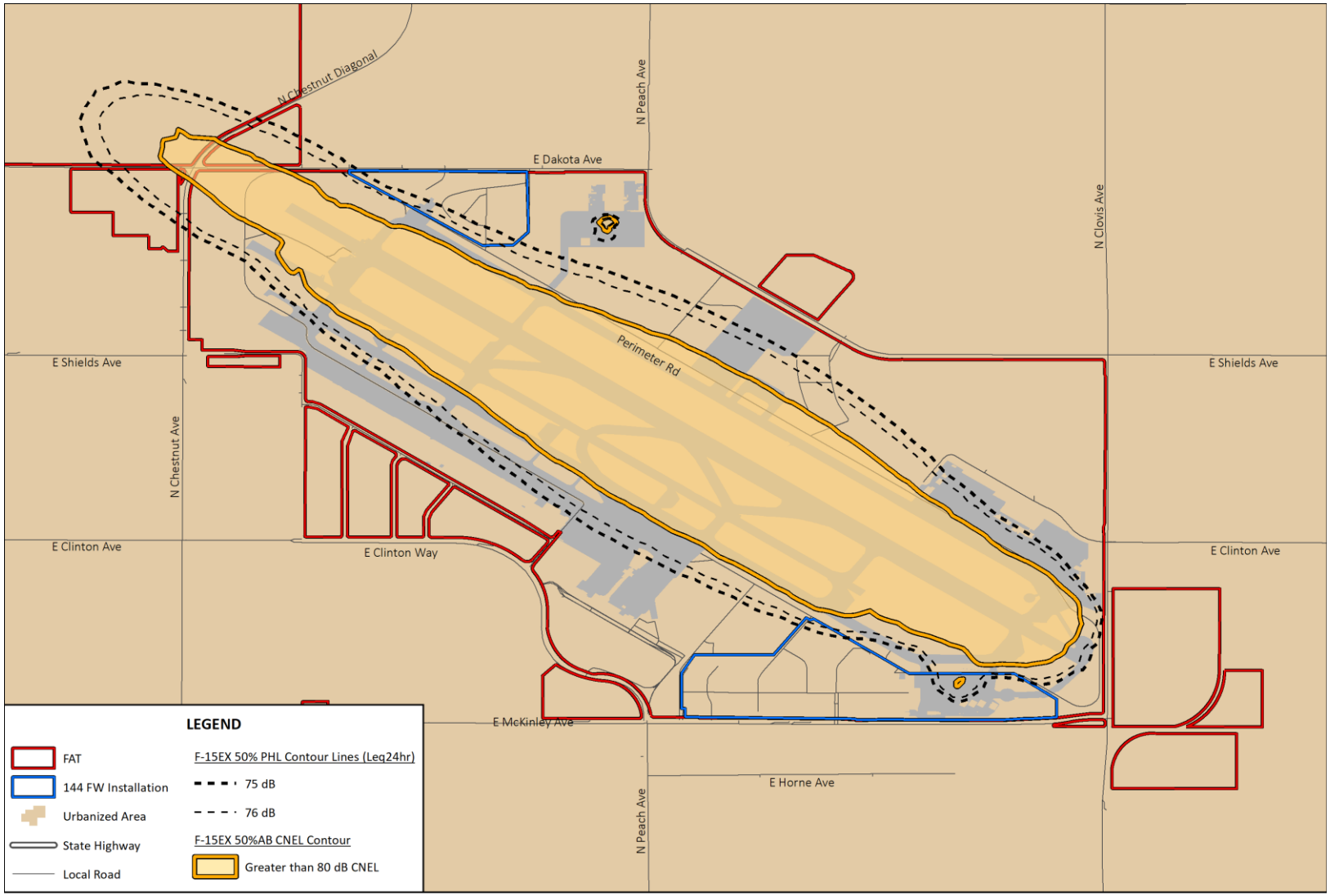

Figure 4-13 F-15EX 50 Percent Afterburner Scenario – Potential for Hearing Loss

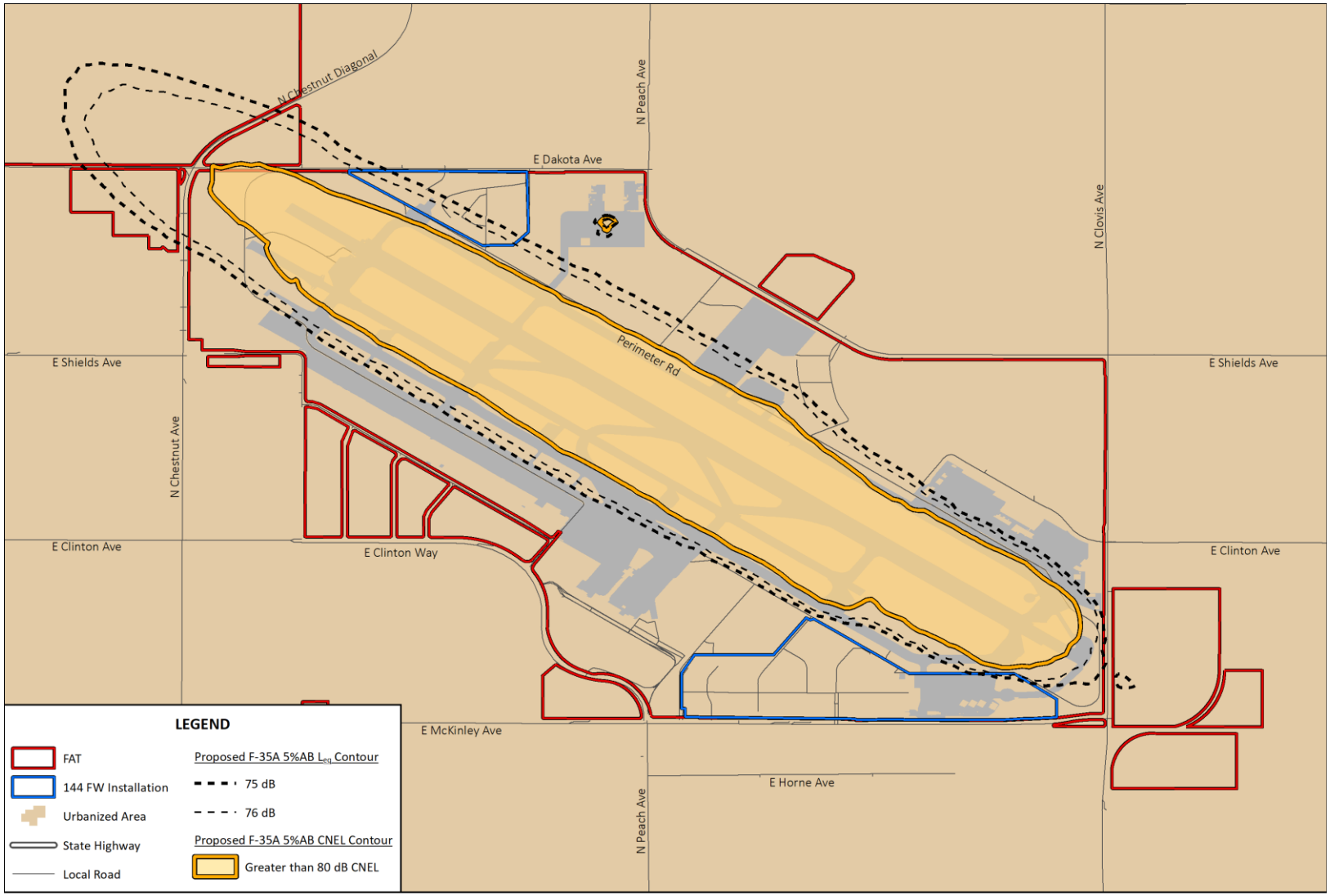

Figure 4-14 F-35A 5 Percent Afterburner Scenario – Potential for Hearing Loss

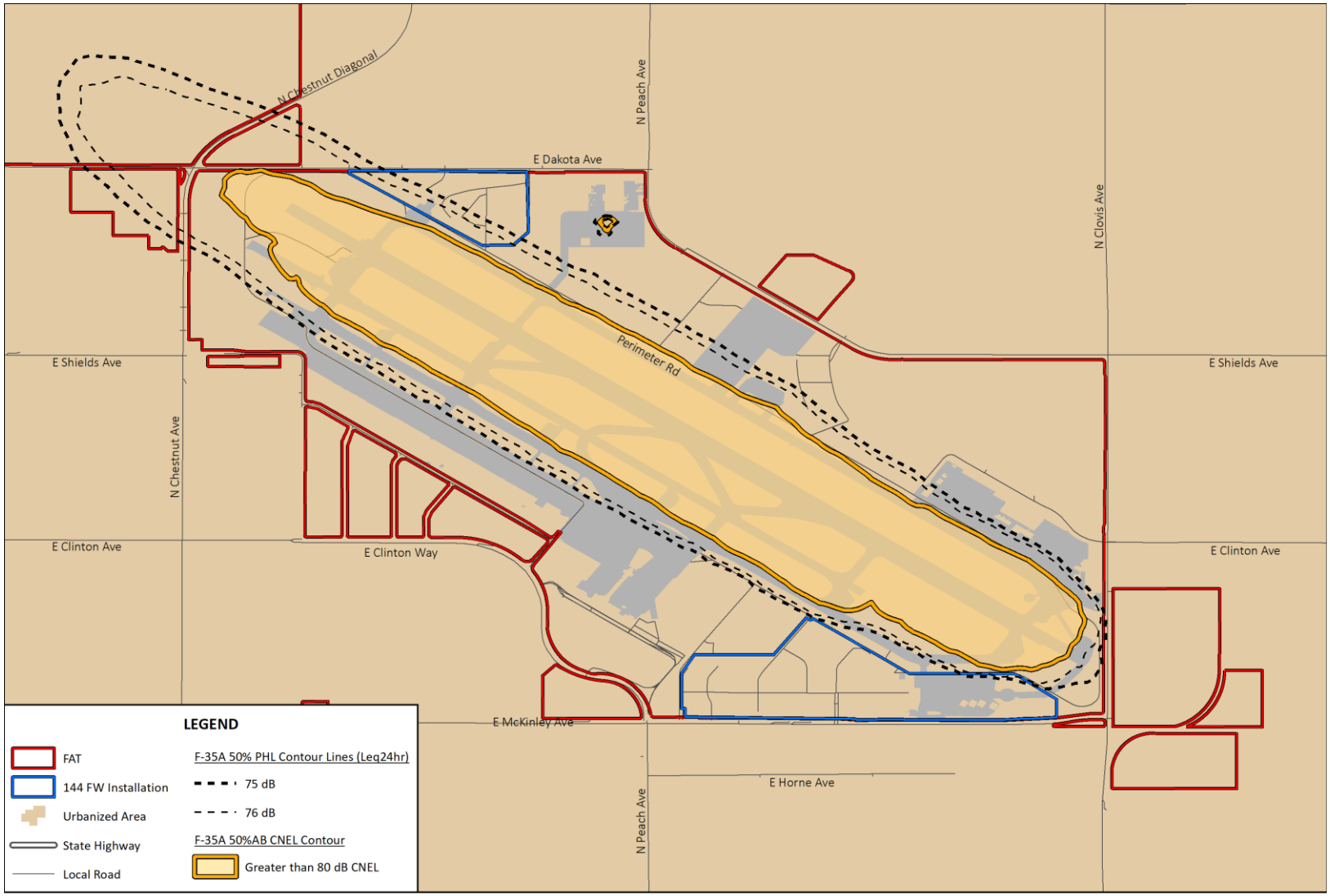

Figure 4-15 F-35A 50 Percent Afterburner Scenario – Potential for Hearing Loss

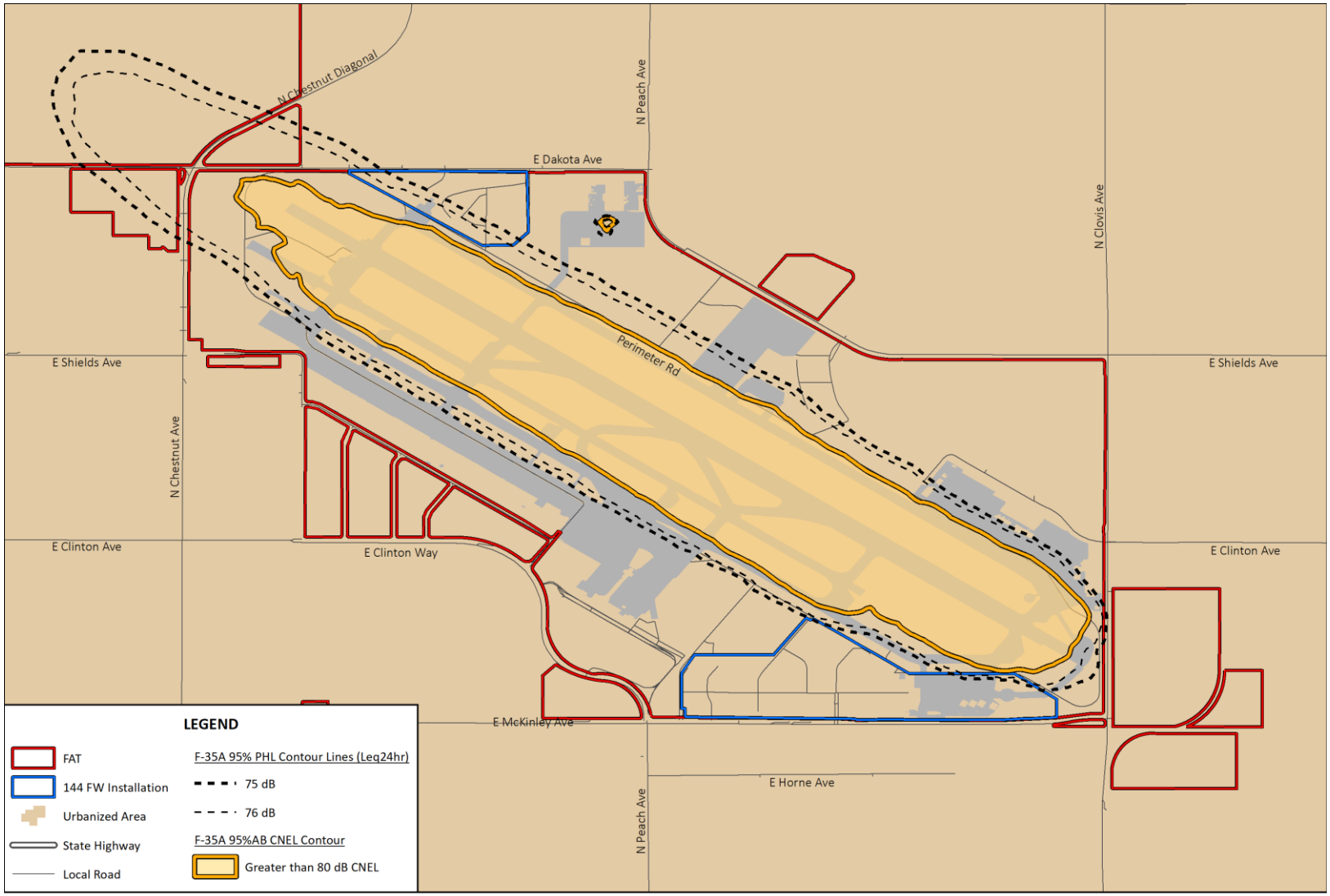

Figure 4-16 F-35A 95 Percent Afterburner Scenario – Potential for Hearing Loss

4.1.2.7 FAA Order 1050.1F Airfield Impact Analysis

Because the FAA, a cooperating agency, applies differing significance criteria for noise impact analysis, this section presents analysis results that support the two proposed alternatives presented in the EIS (F-15EX with 80 percent afterburner and F-15A with 5 percent afterburner). FAA Order 1050.1F defines an action as significant if it "would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe." Additionally, FAA Order 1050.1F requires disclosure of noise sensitive areas that would be exposed "to aircraft noise at or above DNL 60 dB but below DNL 65 dB and are projected to experience a noise increase of DNL 3 dB or more, only when DNL 1.5 dB increases are documented within the DNL 65 dB contour." Figures 4-17 and 4-18 depict CNEL differences at key thresholds according to FAA guidance described in FAA 1050.1F for each of the proposed scenarios. These results, along with Table 4-13, are included in this analysis to aid in significance determination under FAA criteria.

As shown in Figure 4-17, areas primarily to the north and south of FAT would experience increases in CNEL greater than 1.5 dB that would be exposed to 65 dB CNEL. This would affect 7 POIs (CAFr-R-02, CAFr-C-09, CAFr-C-12, CAFr-C-14, CAFr-S-09, CAFr-S-13, and CAFr-H-02) that would be considered under FAA 1050.1F guidelines to experience a significant noise impact. The FAA also requires reporting increases of 3 dB or greater in CNEL that would occur at noise sensitive locations that would experience CNEL between 60 and 65 dB. This reporting threshold would apply to 6 POIs (CAFr-S-04, CAFr-S-05, CAFr-S-12, CAFr-S-18, CAFr-C-10, CAFr-C-17).

As shown in Figure 4-18, areas primarily to the north and south of FAT would experience increases in CNEL greater than 1.5 dB that would be exposed to 65 dB CNEL. This would affect 9 POIs (CAFr-R-01, R-02; CAFr-S-04, S-09, S-13; CAFr-C-09, C-12, C-14, CAFr-H-02) that would be considered under FAA 1050.1F guidelines to experience a significant noise impact. The FAA also requires reporting increases of 3 dB or greater in CNEL that would occur at noise sensitive locations that would experience CNEL between 60 and 65 dB. This reporting threshold would apply to 14 POIs (CAFr-C-02, C-03, C-05, C-06, C-08, C-11, C-17, C-23; CAFr-S-01, S-03, S-05; S-12, S-18, S-22).

Because the residential POI, denoted with '-R-,' represent a neighborhood of multiple residential properties, Table 4-13 quantifies the acreage, households, and population that would be affected. A total of 1,258 acres, 1,924 households, and an estimated 6,010 people would be exposed to greater than 65 dB CNEL under the F-15EX alternative while experiencing an increase of 1.5 dB or greater change to CNEL relative to existing conditions, which the FAA criteria would classify as a significant impact. A total of 2,035 acres, 5,063 households, and an estimated 14,977 people would be exposed to CNEL between 60 and 65 dB under the F-15EX alternative while experiencing an increase of 3 dB or greater in CNEL relative to existing conditions, which the FAA criteria would classify as a reportable change in noise exposure.

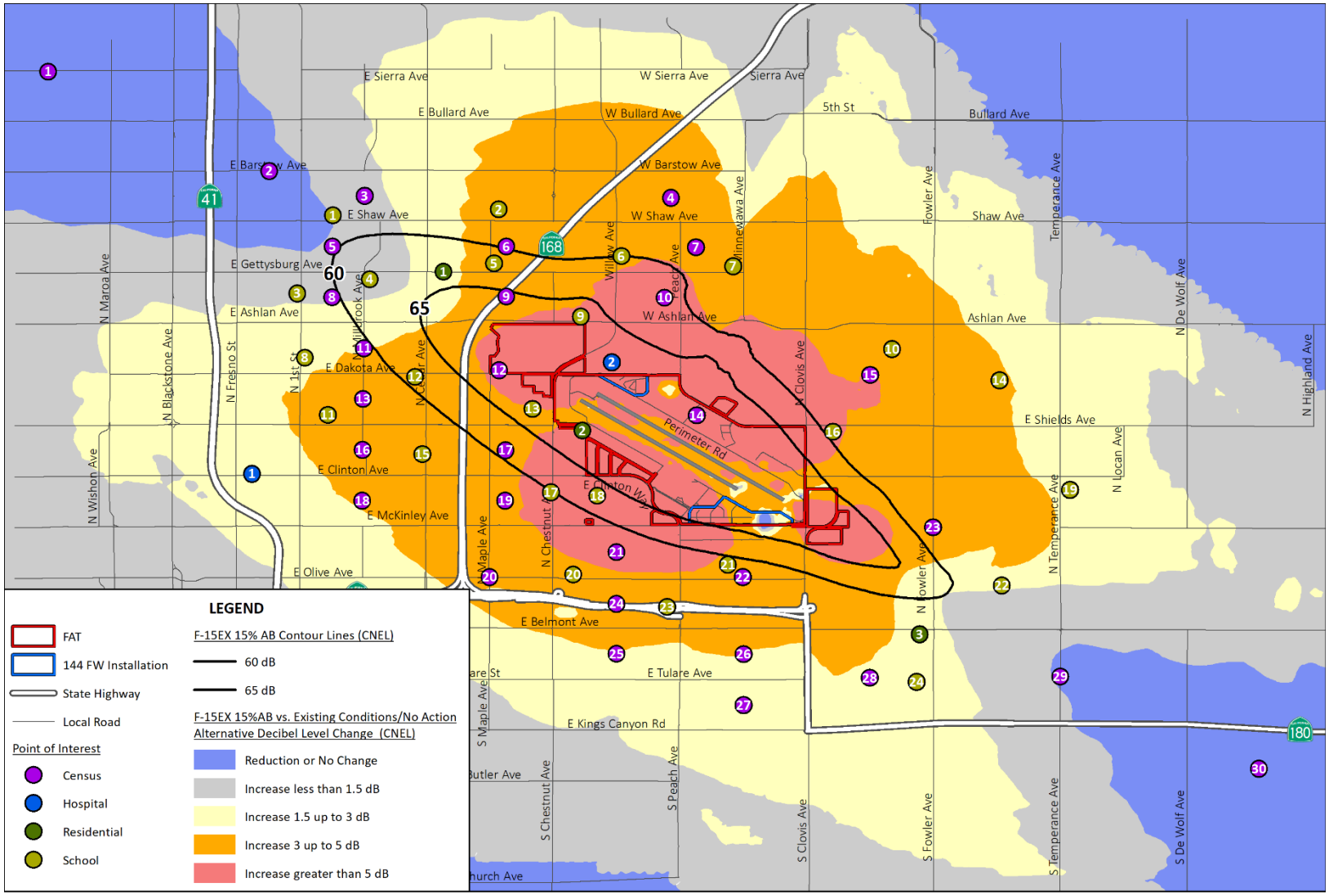

Figure 4-17 Existing Conditions versus F-15 15 Percent Afterburner Difference, Fresno Yosemite International Airport (FAT)

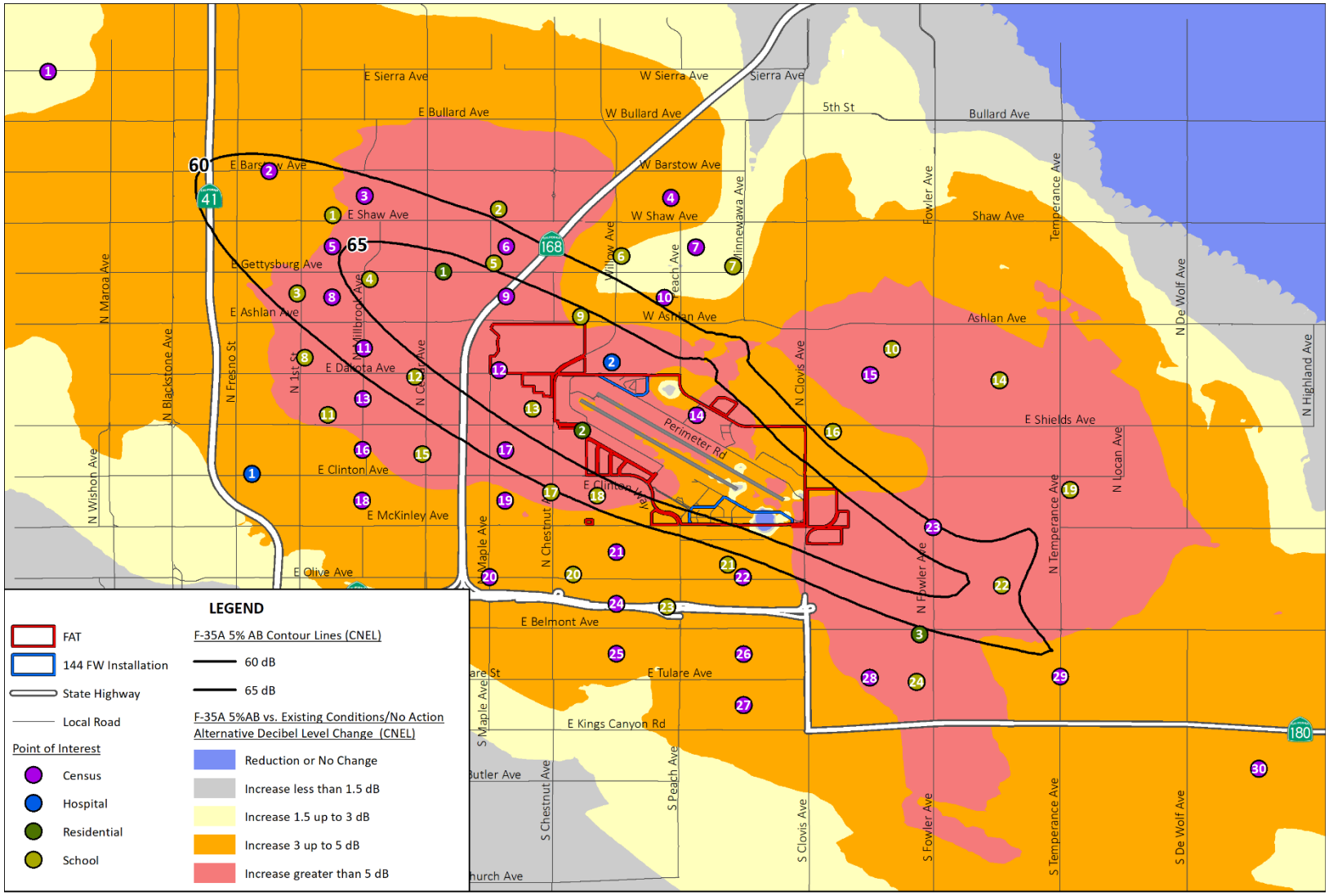

Figure 4-18 Existing Conditions versus F-35 5 Percent Afterburner Difference, Fresno Yosemite International Airport (FAT)

Table 4-13 FAA CNEL Exposure Thresholds Affecting Acreage, Population, and Households Under Proposed Alternatives

Scenario	*FAA Classification*[1]	*Description*	*Acreage*	*Households*	*Population*
F-15EX 15% AB	Significant	+1.5 dB (or higher) Change within 65+ dB CNEL	1,258	1,924	6,010
	Reportable	+3 dB (or higher) Change within 60-65 dB CNEL	2,035	5,063	14,977
F-35A 5% AB	Significant	+1.5 dB (or higher) Change within 65+ dB CNEL	1,930	4,099	12,370
	Reportable	+3 dB (or higher) Change within 60-65 dB CNEL	3,837	10,440	31,099

Note: [1]FAA 1050.1F Desk Reference February 2020.
Legend: AB = afterburner; dB = decibel; CNEL = Community Noise Equivalent Level; FAA = Federal Aviation Administration.

As presented in Table 4-13, a total of 1,930 acres, 4,099 households, and an estimated 12,370 people would be exposed to greater than 65 dB CNEL under the F-35A alternative while experiencing an increase of 1.5 dB or greater change to CNEL relative to existing conditions, which the FAA criteria would classify as a significant impact. A total of 3,837 acres, 10,400 households, and an estimated 31,099 people would be exposed to CNEL between 60 and 65 dB under the F-35A alternative while experiencing an increase of 3 dB or greater in CNEL relative to existing conditions, which the FAA criteria would classify as a reportable change in noise exposure.

4.2 SPECIAL USE AIRSPACE

The following section details the modeling data and the resultant noise exposure for the five proposed afterburner scenarios for aircraft training activity in the 144 FW associated airspace. Under the Proposed Action, either F-15EX or F-35A aircraft would replace the F-15C aircraft of the 144 FW. Because the two F-15EX and the three F-35A afterburner scenarios only differ by afterburner usage rates at FAT, the airspace conditions would be the same for each scenario of the same aircraft types so only one F-15EX and one F-35A condition has been analyzed. Other aircraft type operations would remain unchanged from those described in Section 3.0, *Existing Conditions.*

4.2.1 Modeling Data (Subsonic)

The proposed F-15EX or F-35A aircraft would not require any changes to the current lateral or vertical configurations of any MOA, Restricted Area, Warning Area, or Air Traffic Control Assigned Airspace, nor would it alter their normal scheduled times of use. Since SUA scheduled activation times would not change from current operations, the impacts to the National Airspace System would be unaffected. Visual Flight Rules aircraft would still be allowed to exercise their right to transition through MOAs and Instrument Flight Rules aircraft would not experience any extra flight plan deviations because the SUA activation times would remain the same. Air Traffic Control would continue to provide the required separation pertaining to specific aircraft and type in the SUA.

Under the F-15EX and F-35A alternatives, aircraft would conduct up to 3,281 annual sorties, an increase of 81 percent above the 1,811 currently flown by the F-15C. Since air-to-ground ordnance delivery would be impractical when operating from FAT, it is likely that some portion of the training syllabus would have to be flown from other bases. This analysis presents a 'worst-case' for noise impacts, assuming that the entire year of training would occur in the SUA currently used by the 144 FW, with no training deployments elsewhere to achieve training requirements.

The proportion of time for each sortie in the MOA spent between 500 feet AGL and 10,000 feet MSL would not change for either the F-15EX or F-35A aircraft when compared with the current F-15C. Table 4-14 details the anticipated changes to altitude usage with the largest difference occurring above 18,000 feet MSL where aircraft noise reaching the ground would be negligible.

Table 4-14 Existing Conditions and Proposed MOA Use by Altitude

Altitude (feet)	*Existing Conditions Percentage Use F-15C*	*Proposed Percentage Use F-15EX*	*F-15EX Change from Existing Conditions*	*Proposed Percentage Use F-35A*	*F-35A Change from Existing Conditions*
500–3,000 AGL	1	1	0	1	0
3,000–5,000 AGL	1	1	0	1	0
5,000–10,000 MSL	5	5	0	5	0
10,000 MSL–18,000 MSL	36	38	+2	24	-12
18,000 MSL–30,000 MSL	17	30	+13	58	+41
Above 30,000	40	25	-15	11	-29

Legend: AGL = above ground level; MOA = Military Operations Area; MSL = mean sea level.

4.2.2 Noise Exposure (Subsonic)

Aircraft altitudes, speeds, and power settings vary while operating within the airspace based upon the training exercise. For comparison, Table 4-15 presents single-event noise levels in terms of SEL and L_{max} for the F-15C, F-15EX, and F-35A. In general, the F-15EX would be 2 to 3 dB greater in terms of SEL and 4 to 5 dB greater in L_{max} when compared to the F-15C at times when both aircraft would operate at military power and 400 knots. The F-35A would be 3 to 5 dB greater in terms of SEL and 6 to 8 dB greater in L_{max} when compared to the F-15C at times when both aircraft would operate at military power and 400 knots.

Table 4-15 SEL and L_{max} Comparison for Typical Military Airspace Profiles

Altitude (feet AGL)	*F-15C (PW-220)*		*F-15EX (GE-129)*		*F-35A (PW-100)*	
Metric	*SEL*	*L_{max}*	*SEL*	*L_{max}*	*SEL*	*L_{max}*
500	116	111	119	116	121	119
1,000	111	104	113	109	115	111
2,000	105	97	107	101	108	103
5,000	95	85	98	89	99	91
10,000	86	75	88	79	89	81

Note: All aircraft modeled at military power and 400 knots for comparison.
Legend: AGL = above ground level; L_{max} = Maximum Sound Level; SEL = Sound Exposure Level.
Source: NOISEMAP version 7.3.

Under the two F-15EX scenarios, the F-15EX would replace the existing F-15C. Based on the increase in sorties of 81 percent along with the greater SEL of the F-15EX, $CNEL_{mr}$ in each airspace that would be used by the F-15EX could increase up to 6 dB from the current conditions. The result would be $CNEL_{mr}$ ranging from 41 dB on the upper end down to levels below the software's lower limit of prediction. Therefore, $CNEL_{mr}$ would remain relatively low. Additionally, the 144 FW airspace training would remain primarily at higher altitudes (about 93 percent of time above 10,000 feet MSL), and most aircraft sorties within the SUA would likely not be noticed by any casual observer. For FAA Order 1050.1F impact

analysis, the F-15EX scenarios would correspond to CNEL of 44 dB or less under the airspace, which would also equate to a 5 dB increase from existing conditions

Under the three F-35A scenarios, the F-35A would replace the existing F-15C. Based on the increase in sorties of 81 percent along with the greater SEL of the F-35A, $CNEL_{mr}$ in each airspace that would be used by the F-35A could increase up to 8 dB above the current conditions. The result would be $CNEL_{mr}$ ranging from 43 dB down to levels below the software's lower limit of prediction. Therefore, $CNEL_{mr}$ would remain relatively low. Additionally, the 144 FW airspace training would remain primarily at higher altitudes (about 93 percent of time above 10,000 feet MSL), and most aircraft sorties within the SUA would likely not be noticed by any casual observer. For FAA Order 1050.1F impact analysis, the F-15EX scenarios would correspond to CNEL of 46 dB or less under the airspace, which would equate to a 7 dB increase from existing conditions.

4.2.3 Modeling Data (Supersonic)

Supersonic flight would primarily be associated with air combat training. Some of these training sorties require aircraft to exceed Mach 1.0 (supersonic) for brief periods of time, which creates a shock wave. Depending on the aircraft's altitude and the local atmospheric conditions, this shock wave can reach the ground, causing a "sonic boom." Higher altitudes and warmer surface temperatures can result in the sonic boom not reaching the surface of the earth. Lower altitudes for supersonic flight and higher speeds (higher Mach numbers) increase the likelihood and intensity of sonic booms.

Supersonic operations for both the F-15EX and F-35A would be in the same airspace as the existing F-15C, but the frequency of supersonic events would increase, proportional to the overall increase in sorties. The altitudes and duration for each individual supersonic flight, for either the F-15EX or F-35A scenarios, is expected to remain similar to existing conditions.

4.2.4 Noise Exposure (Supersonic)

BOOMAP96 was developed to analyze supersonic aircraft activity within airspace with little to no limitations on minimum altitudes, which would not be applicable to airspace analyzed in this study with supersonic minimums of 10,000 feet MSL. However, the software can provide an accurate calculation of the relative or change to CDNL that would occur under a proposed action compared to existing conditions, as described below.

Under the F-15EX scenarios, the F-15EX would replace the F-15C for supersonic activity in the W-283/285 overwater airspace located 15 miles from land and the 10,000 feet MSL minimum altitude would not change. The frequency of supersonic activity in these areas would increase by 81 percent from the existing conditions, which would equate to an increase in CDNL of 2 to 3 dB. Although the magnitude of noise generated by each sonic boom depends upon the shape and size of the aircraft, the F-15EX and F-15C aircraft both share the same airframe and would operate similarly during supersonic operations so each supersonic noise event for the F-15EX would be the same as the existing F-15C. Therefore, the overall change to CDNL in W-283/285 would be up to 3 dB greater than existing conditions due to the increase in supersonic sorties.

Under the F-35A scenarios, the F-35A would replace the F-15C for supersonic activity in the W-283/285 overwater ranges. The frequency of supersonic activity in these areas would increase by 81 percent from the existing conditions, which would equate to an increase in CDNL of 2 to 3 dB. The magnitude of noise

generated by each sonic boom depends upon the shape and size of the aircraft. Although BOOMAP96 does not include supersonic noise modeling data for the F-35A, noise data for a similar fifth generation fighter, the F-22, suggests that fifth generation fighters generate greater noise levels during supersonic activities than legacy aircraft, like F-15. Given that the dimensions of the F-35A are approximately 20 percent smaller than the F-22, noise levels due to the F-35A are estimated to fall between the F-22 and legacy aircraft like F-15. Using BOOMAP96, a midpoint value between the F-15 and F-22 would result in CDNL for the F-35A estimated to be approximately 4 to 5 dB greater than the F-15C under current operations. Therefore, the overall change to CDNL in W-283/285 under the F-35A scenarios would be up to 8 dB greater than existing conditions due to a combination of the increase in supersonic sorties and different aircraft characteristics of the F-35A.

5.0 NO ACTION ALTERNATIVE

Under the No Action Alternative, noise levels and exposure from aircraft operations would be identical as described within the Section 3.0, *Existing Conditions*, for both FAT and SUA training. F-15C aircraft activity would remain at approximately 4,100 operations at FAT and 1,900 sorties that would occur within SUA. Further, based military Army National Guard, military transient, and civilian operations are assumed to remain constant as they have through all scenarios into the near future and the beginning of implementation of the Proposed Action alternatives in 2025.

6.0 CONCLUSION

Table 6-1 presents a quantitative summary of the potential noise impacts, as identified by DoD criteria, associated with either the F-15EX or F-35A aircraft beddown as compared to existing conditions. Noise analysis results summarized in the table includes acreage and households/population impacted, number of POIs affected, number of school POIs affected, and PA by the two aircraft beddowns and their various potential afterburner usage, which the DoD takes into account when determining significant impacts. The DoD determination varies from the FAA determination of significance, where a significant impact would occur under the following FAA criteria: (1) noise sensitive land uses and population within the existing CNEL 65+ dB footprint were subject to an increase in CNEL of 1.5 dB or greater; (2) noise sensitive land uses and population would experience a CNEL 1.5 dB or greater increase and be newly exposed to a CNEL of 65 dB or greater; or, (3) noise sensitive land uses and population within the existing CNEL 60–65 dB footprint were subject to an increase in CNEL of 3.0 dB or greater. Table 6-2 highlights significant noise impacts utilizing FAA noise level criteria associated with either the F-15EX or F-35A aircraft beddown as compared to the Existing Conditions/No Action Alternative.

Table 6-1 Summary of Potential Noise Impacts Utilizing DoD Criteria Associated with the F-15EX and F-35A Alternatives at FAT

Category	*Condition*	*Existing Condition*	*F-15EX 15% AB*	*F-15EX 80% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
CNEL: Number of POIs	Exposed to >65 dB CNEL	4	7 (+3)	7 (+3)	10 (+6)	9 (+5)	9 (+5)
	Exposed to >70 dB CNEL	0	4 (+4)	3 (+3)	4 (+4)	4 (+4)	4 (+4)
	Exposed to >75 dB CNEL	0	1 (+1)	1 (+1)	0 (+0)	0 (+0)	0 (+0)
	Decrease of 1 dB or greater		2	5	0	0	0
	No change		4	3	0	0	0
	Increase of 1 dB		3	4	0	0	0
	Increase of 2 to 4 dB		32	26	21	20	16
	Increase of 5 dB or greater		18	21	38	39	43

Category	*Condition*	*Existing Condition*	*F-15EX 15% AB*	*F-15EX 80% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
Off-Airport Exposure	Acreage	176	1,262 (+1,086)	1,238 (+1,062)	1,936 (+1,759)	1,882 (+1,706)	1,831 (+1,655)
	Households	149	1,929 (+1,780)	1,672 (+1,523)	4,105 (+3,956)	3,916 (+3,767)	3,729 (+3,580)
	Estimated Population	434	6,023 (+5,589)	5,195 (+4,761)	12,390 (+11,956)	11,873 (+11,439)	11,365 (+10,931)
School, $L_{eq(8hr)}$: Number of School POIs	Greater than 60 dB $L_{eq(8hr)}$	14	29 (+15)	31 (+17)	36 (+22)	36 (+22)	36 (+22)
School, Numbers of Events per Average School Day Hour: Number of School POIs	With No Interfering Events	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	With 1 to 5 Interfering Events	57	55 (-2)	55 (-2)	55 (-2)	55 (-2)	55 (-2)
	With >5 Interfering Events	2	4 (+2)	4 (+2)	4 (+2)	4 (+2)	4 (+2)
School, Time Above Interior 50 dB for 8 Hour School Day: Number of School POIs	Duration of less than 10 min	55	54 (-1)	54 (-1)	50 (-5)	48 (-7)	44 (-11)
	Duration of 10-30 minutes	4	5 (+1)	5 (+1)	9 (+5)	11 (+7)	15 (+11)
	Duration of >30 minutes	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Speech Interfering Events per Average Hour, Windows Open: Number of POIs	With No Events	7	0 (-7)	0 (-7)	0 (-7)	0 (-7)	0 (-7)
	With 1-2 Events	44	49 (+5)	48 (+4)	48 (+4)	48 (+4)	48 (+4)
	With >2 Events	8	10 (+2)	11 (+3)	11 (+3)	11 (+3)	11 (+3)
Speech Interfering Events per Average Hour, Windows Closed: Number of POIs	With No Events	48	13 (-35)	14 (-34)	5 (-43)	5 (-43)	3 (-45)
	With 1-2 Events	11	46 (+35)	45 (+34)	54 (+43)	54 (+43)	56 (+45)
	With >2 Events	0	0 (+0)	0 (+0)	0 (+0)	0 (+0)	0 (+0)
Probability of Awakening with Windows Open: Number of POIs	With <5% PA	51	50 (-1)	50 (-1)	50 (-1)	50 (-1)	50 (-1)
	With >5% PA	8	9 (+1)	9 (+1)	9 (+1)	9 (+1)	9 (+1)
Probability of Awakening with Windows Closed: Number of POIs	With <5% PA	53	53 (+0)	53 (+0)	53 (+0)	53 (+0)	53 (+0)
	With >5% PA	6	6 (+0)	6 (+0)	6 (+0)	6 (+0)	6 (+0)

Notes: Parenthetical represents change from existing conditions.

Legend: % = percent; < = less than; > = greater than; AB = afterburner; dB = decibel; DoD = Department of Defense; CNEL = Community Noise Equivalent Level; FAT = Fresno Yosemite International Airport.

Table 6-2 Significant Noise Impacts Utilizing FAA Criteria Associated with the F-15EX and F-35A Alternatives at FAT – CNEL

Map ID	*Named POI*	*Existing Conditions/ No Action*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-C-01	Census Tract 45.03	52	50 (-2)	50 (-2)	55 (+3)	55 (+3)	55 (+3)
FR-C-02	Census Tract 54.10	56	56 (0)	55 (-1)	61 (+5)	61 (+5)	60 (+4)
FR-C-03	Census Tract 54.03	56	57 (+1)	57 (+1)	62 (+6)	61 (+5)	61 (+5)
FR-C-04	Census Tract 56.08	48	52 (+4)	52 (+4)	52 (+4)	52 (+4)	52 (+4)
FR-C-05	Census Tract 53.02	60	60 (0)	59 (-1)	**65 (+5)**	64 (+4)	64 (+4)
FR-C-06	Census Tract 53.04	56	60 (+4)	59 (+3)	62 (+6)	62 (+6)	62 (+6)
FR-C-07	Census Tract 31.02	52	57 (+5)	57 (+5)	54 (+2)	54 (+2)	54 (+2)
FR-C-08	Census Tract 53.01	58	60 (+2)	59 (+1)	64 (+6)	63 (+5)	63 (+5)
FR-C-09	Census Tract 53.05	62	**66 (+4)**	**65 (+3)**	**68 (+6)**	**68 (+6)**	**68 (+6)**
FR-C-10	Census Tract 31.03	56	61 (+5)	61 (+5)	59 (+3)	59 (+3)	59 (+3)
FR-C-11	Census Tract 52.04	56	59 (+3)	59 (+3)	62 (+6)	62 (+6)	62 (+6)

Map ID	*Named POI*	*Existing Conditions/ No Action*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-C-12	Census Tract 52.02	65	**71 (+6)**	**69 (+4)**	**72 (+7)**	**72 (+7)**	**72 (+7)**
FR-C-13	Census Tract 52.03	53	56 (+3)	56 (+3)	58 (+5)	58 (+5)	58 (+5)
FR-C-14	Census Tract 31.04	69	**75 (+6)**	**76 (+7)**	**74 (+5)**	**74 (+5)**	**74 (+5)**
FR-C-15	Census Tract 58.04	50	55 (+5)	57 (+7)	56 (+6)	56 (+6)	56 (+6)
FR-C-16	Census Tract 33.01	50	53 (+3)	53 (+3)	55 (+5)	55 (+5)	55 (+5)
FR-C-17	Census Tract 32.01	56	61 (+5)	61 (+5)	62 (+6)	62 (+6)	62 (+6)
FR-C-18	Census Tract 33.02	48	51 (+3)	51 (+3)	52 (+4)	52 (+4)	52 (+4)
FR-C-19	Census Tract 32.02	52	56 (+4)	57 (+5)	57 (+5)	57 (+5)	57 (+5)
FR-C-20	Census Tract 28	46	50 (+4)	50 (+4)	50 (+4)	50 (+4)	51 (+5)
FR-C-21	Census Tract 29.06	51	57 (+6)	58 (+7)	56 (+5)	56 (+5)	56 (+5)
FR-C-22	Census Tract 30.01	53	57 (+4)	58 (+5)	57 (+4)	57 (+4)	58 (+5)
FR-C-23	Census Tract 58.05	54	58 (+4)	57 (+3)	61 (+7)	61 (+7)	61 (+7)
FR-C-24	Census Tract 29.05	47	51 (+4)	52 (+5)	51 (+4)	51 (+4)	52 (+5)
FR-C-25	Census Tract 29.04	44	47 (+3)	48 (+4)	48 (+4)	48 (+4)	49 (+5)
FR-C-26	Census Tract 30.04	47	50 (+3)	50 (+3)	51 (+4)	51 (+4)	51 (+4)
FR-C-27	Census Tract 30.03	43	46 (+3)	46 (+3)	47 (+4)	47 (+4)	48 (+5)
FR-C-28	Census Tract 14.11	47	50 (+3)	50 (+3)	53 (+6)	53 (+6)	53 (+6)
FR-C-29	Census Tract 14.12	54	54 (0)	54 (0)	59 (+5)	58 (+4)	58 (+4)
FR-C-30	Census Tract 59.04	51	50 (-1)	50 (-1)	55 (+4)	55 (+4)	55 (+4)
FR-H-01	Fresno VA Medical Center	46	48 (+2)	48 (+2)	50 (+4)	50 (+4)	50 (+4)
FR-H-02	Care Facilities Network	66	**71 (+5)**	**71 (+5)**	**72 (+6)**	**72 (+6)**	**72 (+6)**
FR-R-01	E. Gettysburg Avenue and N. Rowell Avenue	61	63 (+2)	62 (+1)	**67 (+6)**	**67 (+6)**	**67 (+6)**
FR-R-02	E. Simpson Avenue and N. Winery Avenue	66	**71 (+5)**	**71 (+5)**	**71 (+5)**	**71 (+5)**	**71 (+5)**
FR-R-03	E. Madison Avenue and N. Renn Avenue	53	56 (+3)	55 (+2)	59 (+6)	59 (+6)	59 (+6)
FR-S-01	Fresno Regional Occupational Program, Tioga Middle, and Wolter	59	59 (0)	58 (-1)	63 (+4)	63 (+4)	63 (+4)
FR-S-02	University High and California State	53	57 (+4)	56 (+3)	59 (+6)	59 (+6)	59 (+6)
FR-S-03	Truth Tabernacle Christian School	57	58 (+1)	57 (0)	62 (+5)	62 (+5)	61 (+4)
FR-S-04	Thomas Elementary	61	62 (+1)	61 (0)	**66 (+5)**	**66 (+5)**	**66 (+5)**
FR-S-05	Vinland Elementary	58	62 (+4)	61 (+3)	64 (+6)	64 (+6)	64 (+6)
FR-S-06	College Community (Economic Opportunities Commission) Head Start Community College	55	60 (+5)	60 (+5)	58 (+3)	58 (+3)	58 (+3)
FR-S-07	Tarpey Elementary	52	56 (+4)	56 (+4)	54 (+2)	54 (+2)	55 (+3)
FR-S-08	Maverick Prep Private School for Gif	53	55 (+2)	55 (+2)	58 (+5)	58 (+5)	58 (+5)
FR-S-09	Viking Elementary and Fresno Unified School District-Viking Childcare	62	**67 (+5)**	**67 (+5)**	**66 (+4)**	**66 (+4)**	**66 (+4)**
FR-S-10	Miramonte Elementary	46	50 (+4)	51 (+5)	52 (+6)	52 (+6)	53 (+7)
FR-S-11	Carter G. Woodson Public Charter and Learn Academy	50	54 (+4)	53 (+3)	56 (+6)	55 (+5)	55 (+5)
FR-S-12	Centennial Elementary, Dakota Circle (Economic Opportunities Commission), and Erma Duncan Polytechnical High	57	61 (+4)	60 (+3)	63 (+6)	63 (+6)	63 (+6)
FR-S-13	Irwin O. Addicott Elementary and Scandinavian Middle	63	**68 (+5)**	**68 (+5)**	**69 (+6)**	**69 (+6)**	**69 (+6)**
FR-S-14	Roger S. Oraze Elementary	43	46 (+3)	47 (+4)	50 (+7)	50 (+7)	50 (+7)
FR-S-15	McLane High	51	56 (+5)	56 (+5)	57 (+6)	57 (+6)	57 (+6)
FR-S-16	Cup Large Day Care Center	54	59 (+5)	60 (+6)	58 (+4)	59 (+5)	59 (+5)
FR-S-17	Ericson Elementary	54	60 (+6)	61 (+7)	60 (+6)	60 (+6)	60 (+6)
FR-S-18	Sierra Charter and Violet Heintz Education Academy	57	63 (+6)	64 (+7)	62 (+5)	62 (+5)	62 (+5)
FR-S-19	Virginia R. Boris Elementary	46	48 (+2)	48 (+2)	55 (+9)	55 (+9)	55 (+9)

Map ID	*Named POI*	*Existing Conditions/ No Action*	*F-15EX 15% AB*	*F-15EX 50% AB*	*F-35A 5% AB*	*F-35A 50% AB*	*F-35A 95% AB*
FR-S-20	Ewing Elementary and Remnant Christian School	48	53 (+5)	53 (+5)	52 (+4)	53 (+5)	53 (+5)
FR-S-21	Fresno Adventist Academy	54	59 (+5)	60 (+6)	58 (+4)	58 (+4)	59 (+5)
FR-S-22	Temperance-Kutner Elementary	54	56 (+2)	55 (+1)	62 (+8)	62 (+8)	62 (+8)
FR-S-23	Molly S. Bakman Elementary and Turner Elementary	47	50 (+3)	51 (+4)	51 (+4)	52 (+5)	52 (+5)
FR-S-24	Fancher Creek Elementary	49	51 (+2)	51 (+2)	54 (+5)	54 (+5)	54 (+5)

Notes: Parenthetical represents change from existing conditions; Bolded represents significant increases according to FAA Order 1050.1F.
Bold means that exposed to CNEL greater than 65 dB and would experience an increase of 1.5 dB or greater.
Legend: AB = afterburner; CNEL = Community Noise Equivalent Level; FAA = Federal Aviation Administration; FAT = Fresno Yosemite International Airport; ID = Identification; POI = Point of Interest.

7.0 TERMINAL AREA FORECAST ANALYSIS

As described in Section 1.1, the NGB relied upon the 'best available information' at the time of preparing this analysis at the time of data collection in 2021 and 2022, which was a combination of civilian aircraft operations as modeled in prior NEM updates completed under 14 CFR Part 150 and average historical civilian operations levels from the FAA OPSNET. Therefore, this section describes additional analysis of that recently released TAF civil data and the potential impacts associated with those operations as compared to the 2017 to 2019 3-year average operations utilized in Chapters 4 and 5 of this noise study. Additional details on the civil modeling, including fleet mix and stage length, are presented in Appendix A.

Table 7-1 Comparison of Modeled Civil Flight Operations at FAT for EIS (2017–2019, 3-year average) and TAF (published in 2023)

Airport		*FAT*	*FAT*
Data Set		*Environmental Impact Statement (EIS) 2017–2019, 3-year Average*	*Terminal Area Forecast (TAF)[1] (projection for 2025)*
Itinerant Operations	Air Carrier	19,117	21,585
	Air Taxi	13,402	7,278
	General Aviation	38,020	39,387
	Military	5,350	5,513
Local Operations	Civil	9,872	12,953
	Military	1,732	2,071
Total Operations		87,494	88,787

Notes: [1]2022 TAF for 2025 Forecast Year prepared by FAA Office of Environment and Energy, Noise Division – November 28, 2023.
Legend: EIS = Environmental Impact Statement; FAT = Fresno Yosemite International Airport
Source: FAA 2023.

Figures 7-1 through 7-2 depict the resulting CNEL contours for the existing conditions and the proposed F-15EX alternative comparing the two sources of civil operations data. For both scenarios analyzed, the 65 dB CNEL contour for the 2022 TAF would be approximately the same as the EIS analyzed conditions. In all scenarios reviewed, the 65 dB CNEL contour would remain approximately consistent for both civil operations data sets along the north and south of FAT. The length of the 65 dB CNEL contour would be slightly longer with the TAF data to the northwest and southeast, which would occur primarily over land utilized for agricultural, commercial, or industrial uses that are not sensitive to noise.

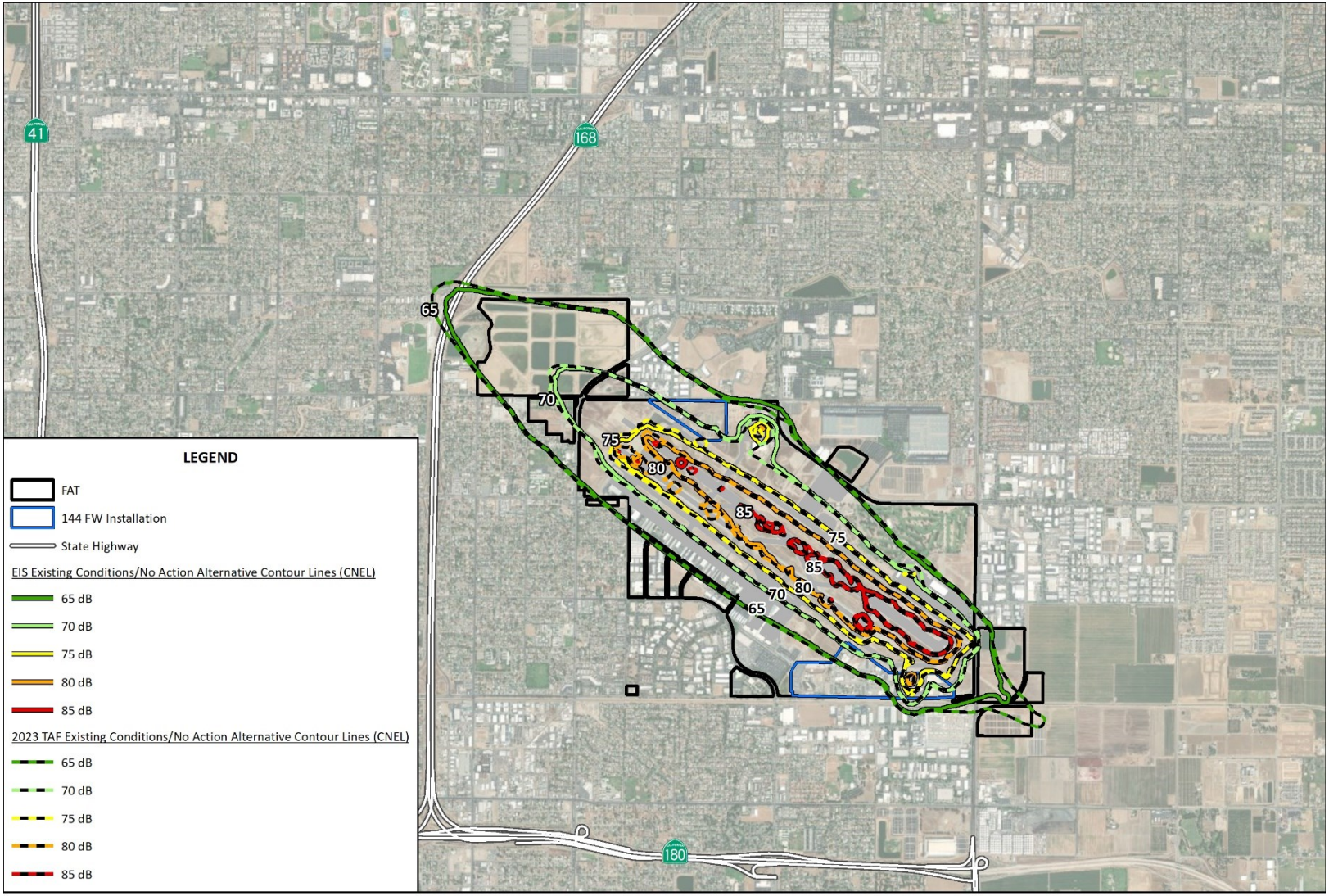

Figure 7-1 Existing Conditions CNEL Contours – Environmental Impact Statement versus 2023 Terminal Area Forecast

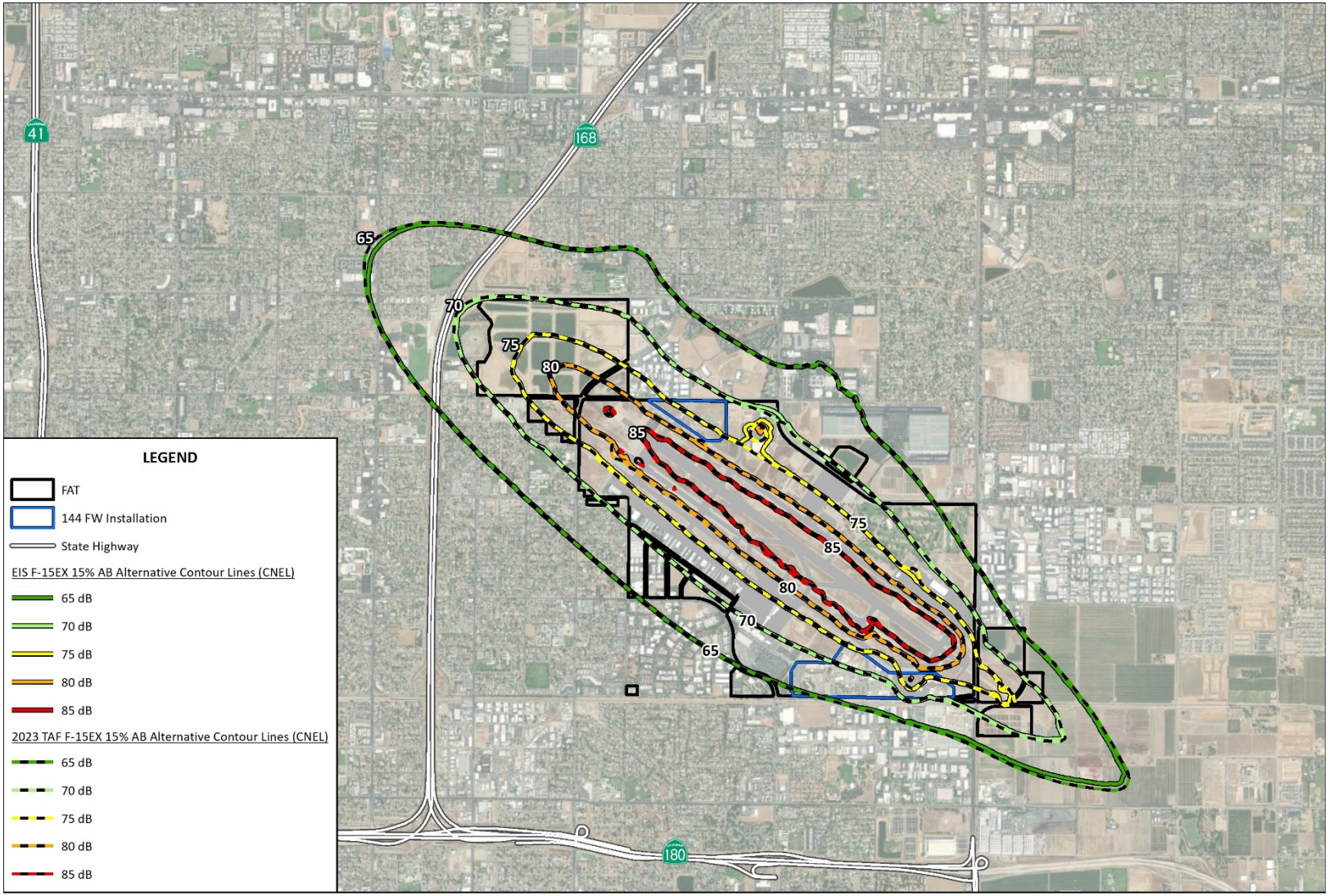

Figure 7-2 F-15EX 15 Percent Afterburner CNEL Contours – Environmental Impact Statement versus 2023 Terminal Area Forecast

Table 7-2 presents the off-airport acreage and estimated total population impacted by 65 dB CNEL or greater. With the 2022 TAF operations under existing conditions, a total of 202 off-airport acres would be exposed to 65 dB CNEL or greater representing an increase of 26 acres from the 3-year average civil operations used in the noise study and associated EIS. The F-15EX alternative would result in 1,300 off-airport acres exposed to 65 dB with the 2022 TAF operations data, an increase of 38 acres calculated in the EIS based upon the 3-year average data.

Table 7-2 2023 TAF Acreage and Estimated Population by CNEL Contour in the Vicinity of FAT

Scenario	*CNEL (dB)*	*TAF Off Airport Acreage*	*TAF Estimated Population*	*Difference from EIS Modeling Acreage*	*Difference from EIS Modeling Estimated Population*
Existing Conditions	65–70	187	525	+26	+119
	70–75	16	29	0	+1
	75–80	0	0	0	0
	80–85	0	0	0	0
	85+	0	0	0	0
	Total	**202**	**554**	**+26**	**+120**
F-15EX 15% A/B	65–70	1,102	5,746	+33	+169
	70–75	174	416	4	+12
	75–80	19	31	1	+1
	80–85	6	12	0	0
	85+	0	0	0	0
	Total	**1,300**	**6,206**	**+38**	**+183**

Note: Totals may not add due to rounding.

Legend: % = percent; A/B = Afterburner; dB = decibel; CNEL = Community Noise Equivalent Level; EIS = Environmental Impact Statement; FAT = Fresno Yosemite International Airport; TAF = Terminal Area Forecast.

In terms of population affected by 65 dB CNEL or greater, the 2022 TAF operations would result in 554 people for existing conditions (120 more than the EIS) and 6,206 people for the F-15EX alternative (183 more than the EIS). The percentage difference in estimated population for the F-15EX between the two civil operations data sets would be approximately 3 percent.

The review of the 2022 TAF operations and resulting off-airport acres and exposed population shows only small differences between the EIS calculated impacts based upon the 2017–2019, 3-year average and 2022 TAF data. Therefore, noise impacts and the conclusions based upon the 2022 FAA TAFs would not change from those currently presented in this EIS.

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Appendix A
Aircraft Modeling Details

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Military Flight Tracks

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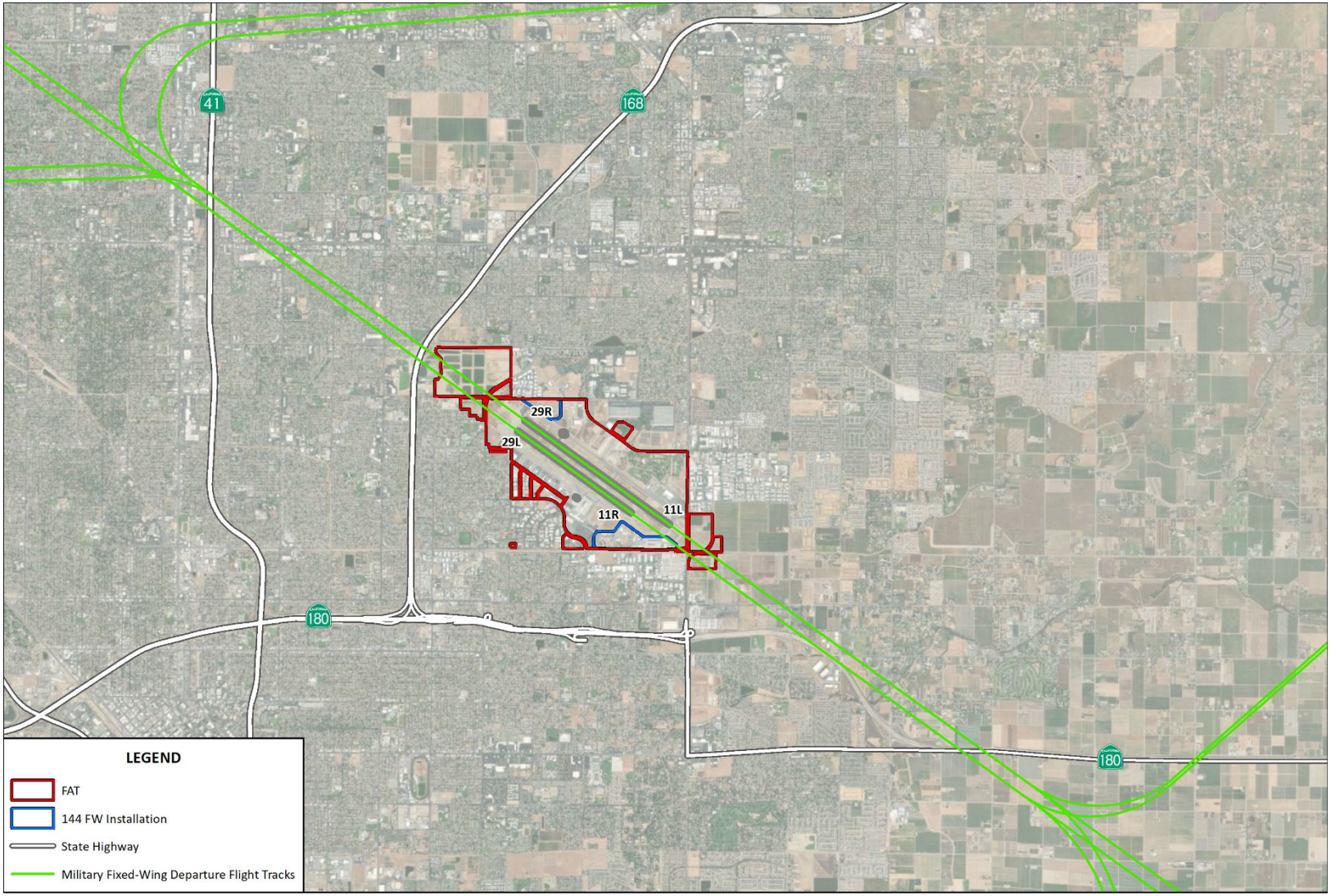
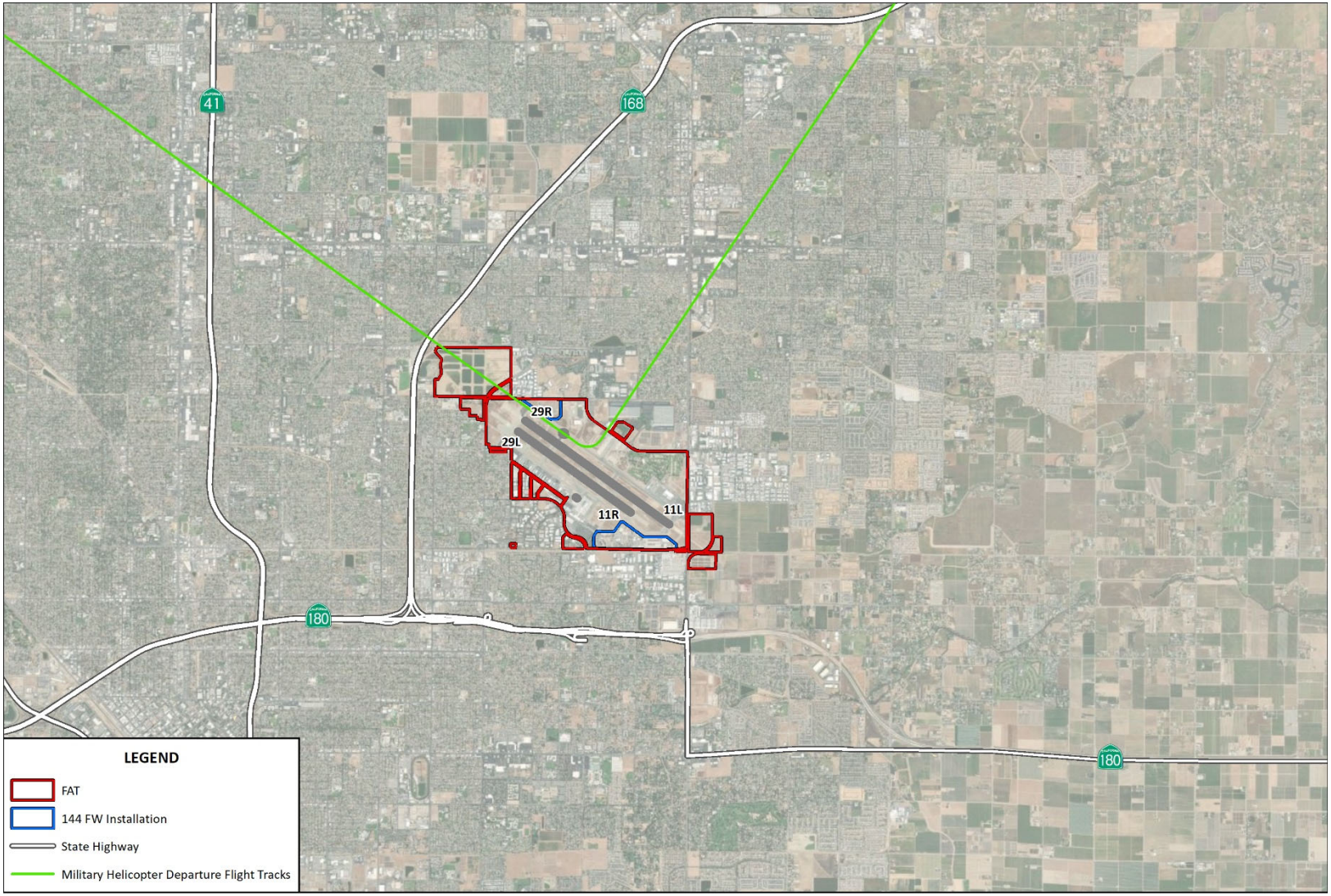
Table A-1 Military Flight Track Use

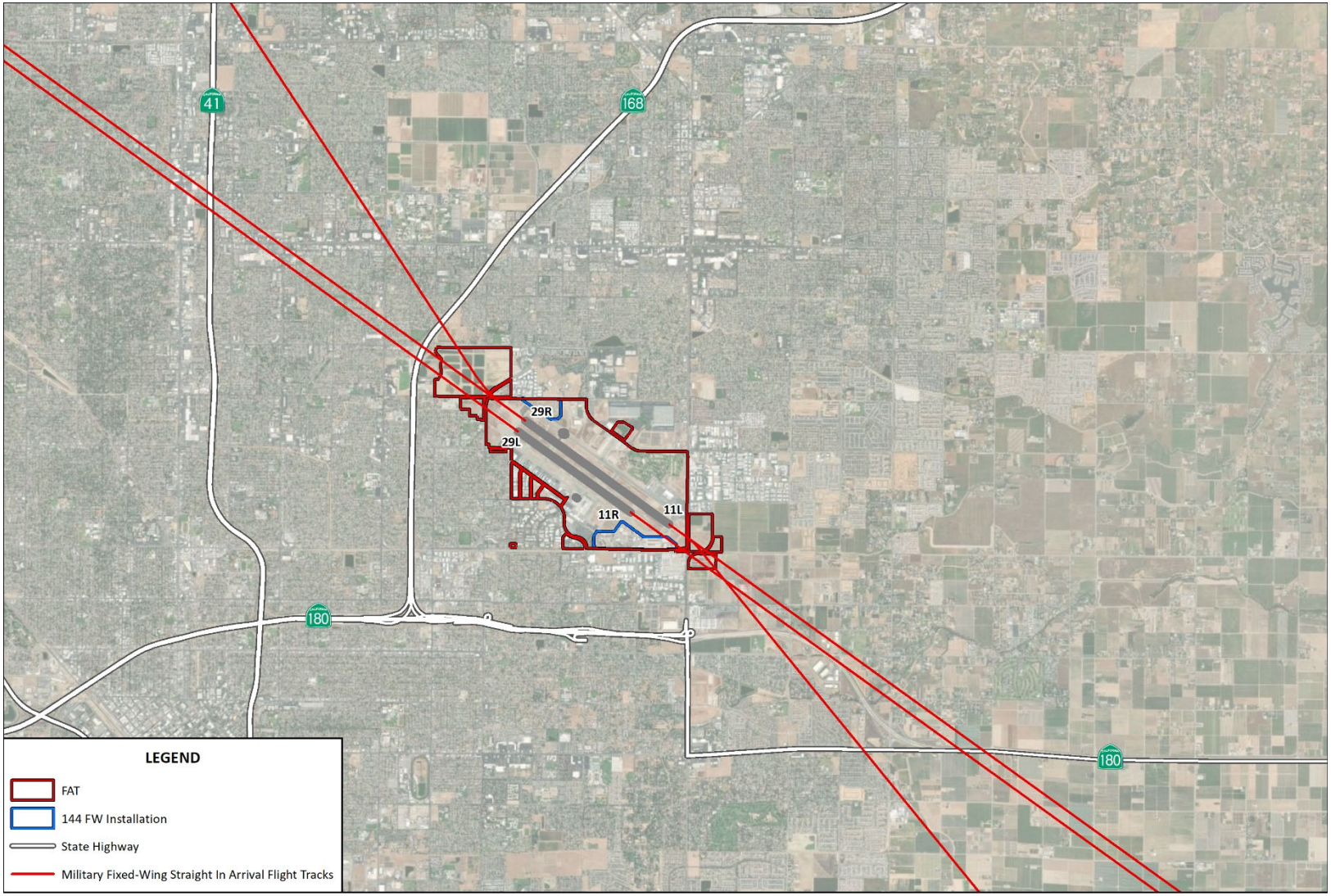
Military Fixed Wing			
Op Type	***Track ID***	***Description***	***Utilization***
Departures	11LD1	Runway heading	80%
	11LD2	Turn east	10%
	11LD3	Turn west	10%
	11RD1	Runway heading	80%
	11RD2	Turn east	10%
	11RD3	Turn west	10%
	29LD1	Runway heading	80%
	29LD2	Turn east	10%
	29LD3	Turn west	10%
	29RD1	Runway heading	80%
	29RD2	Turn east	10%
	29RD3	Turn west	10%
Overhead Break	11LO1	Rwy 11L break north, 1st ship	50%
	11LO2	Rwy 11L break north, 2nd ship	30%
	11LO3	Rwy 11L break north, 3rd ship	20%
	11RO1	Rwy 11R break north, 1st ship	50%
	11RO2	Rwy 11R break north, 2nd ship	30%
	11RO3	Rwy 11R break north, 3rd ship	20%
	29LO1	Rwy 29L break north, 1st ship	50%
	29LO2	Rwy 29L break north, 2nd ship	30%
	29LO3	Rwy 29L break north, 3rd ship	20%
	29RO1	Rwy 29R break north, 1st ship	50%
	29RO2	Rwy 29R break north, 2nd ship	30%
	29RO3	Rwy 29R break north, 3rd ship	20%
TAC Initial	11LTAC1	TAC Initial - Lead	60%
	11LTAC2	TAC Initial - Wing 1nm abeam	40%
	29RTAC1	TAC Initial - Lead	60%
	29RTAC2	TAC Initial - Wing 1nm abeam	40%
Non Break VFR	11LA2	TACAN	100%
	11RA1	VFR straight in	100%
	29LA1	VFR straight in	100%
	29RA1	Straight In ILS	90%
	29RA3	TACAN	10%
Closed Patterns	11LCP1	Left hand pattern Rwy 02	100%
	29RCP1	Left hand pattern Rwy 20	100%
Military Helicopter			
Op Type	***Track ID***	***Description***	***Utilization***
Departures	HD1	Pad to turn north	70%
	HD2	RWY 29 Flow	30%
Arrivals	HA1	From southwest, left to pad	10%
	HA2	From north, right turn to pad	70%
	HA3	From southeast, right to pad	10%
	HA4	From southwest straight to pad	10%
Closed Patterns	11LCP2	left hand	100%
	29RCP2	right hand	100%



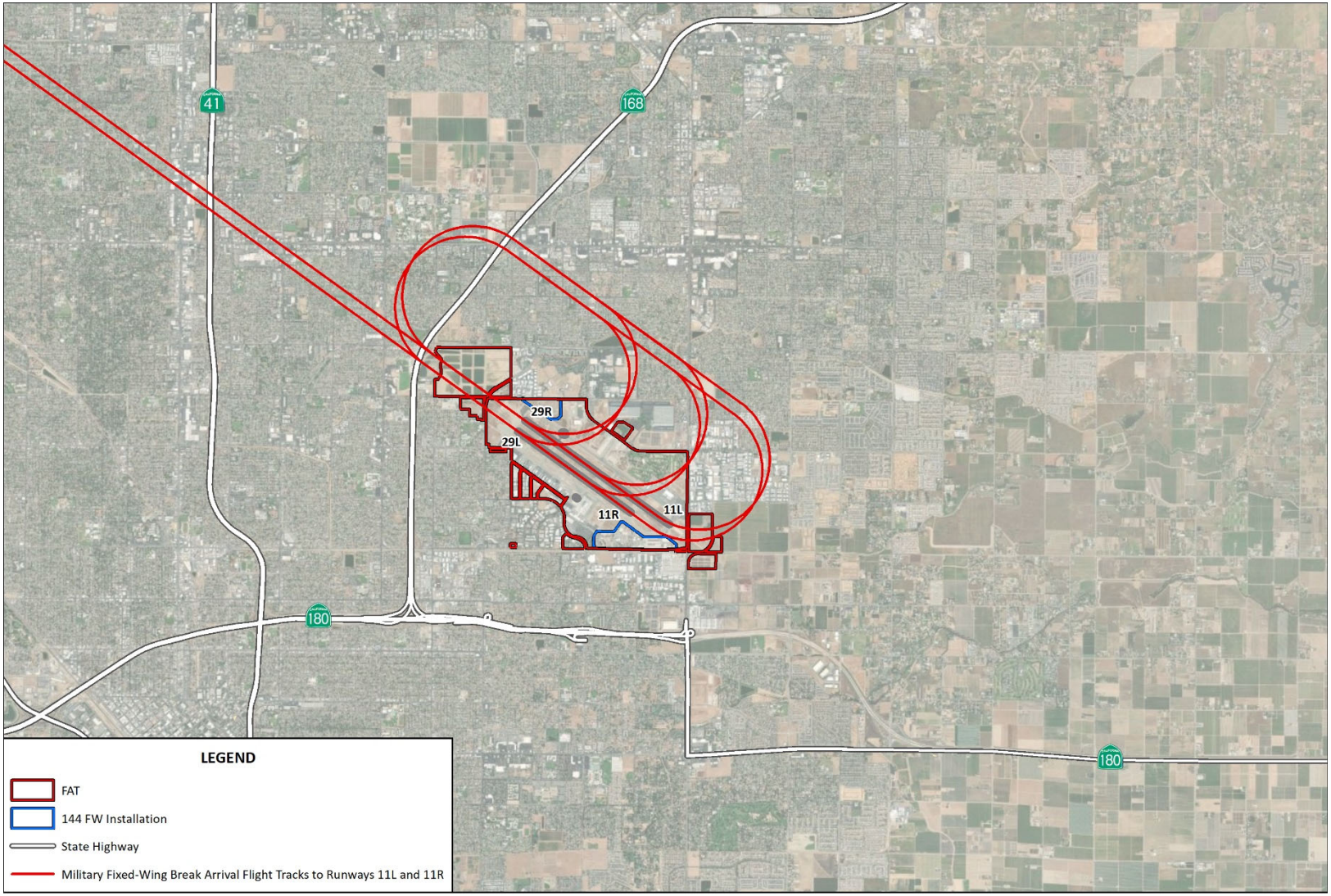
Military Fixed-Wing Departure Flight Tracks at FAT

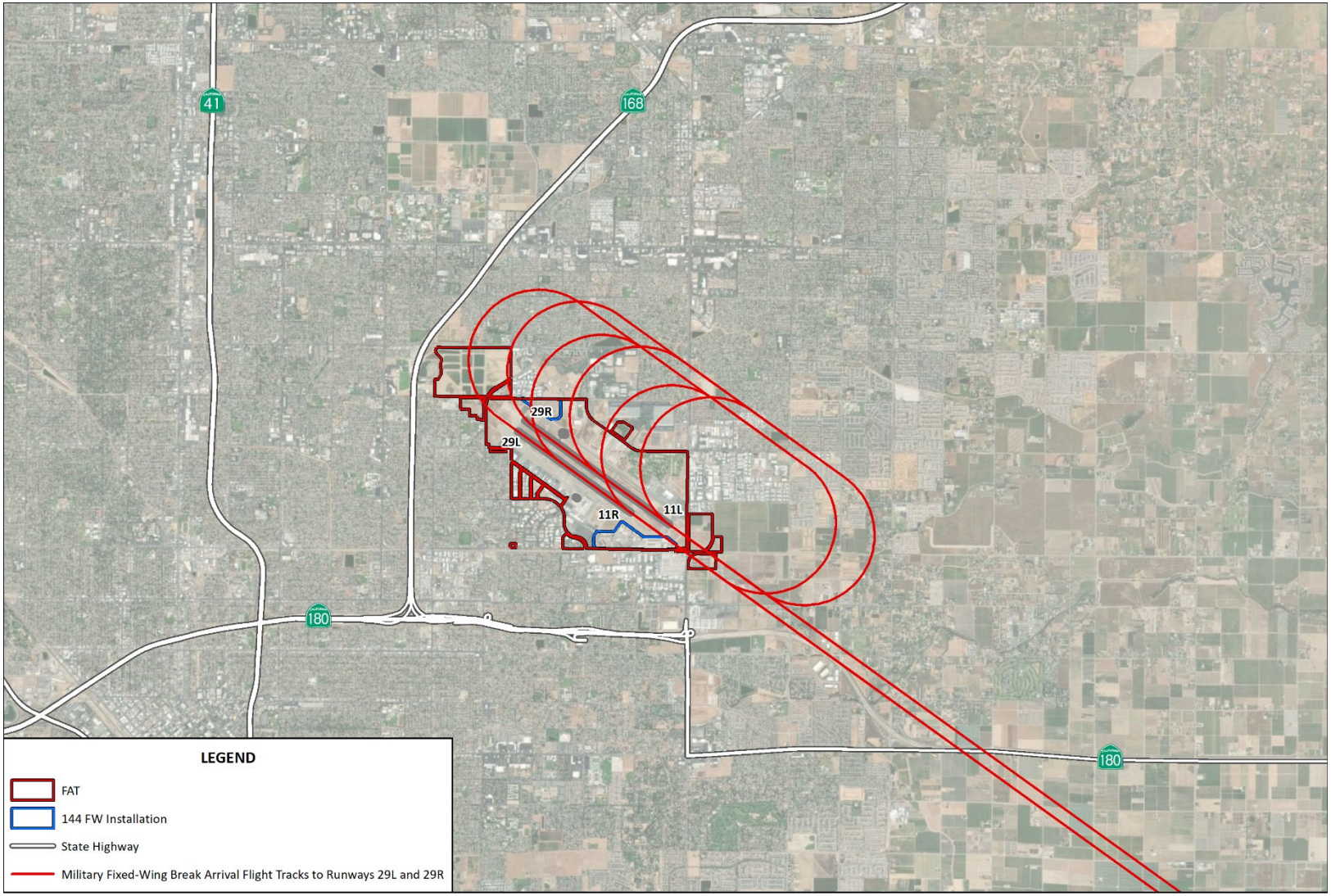


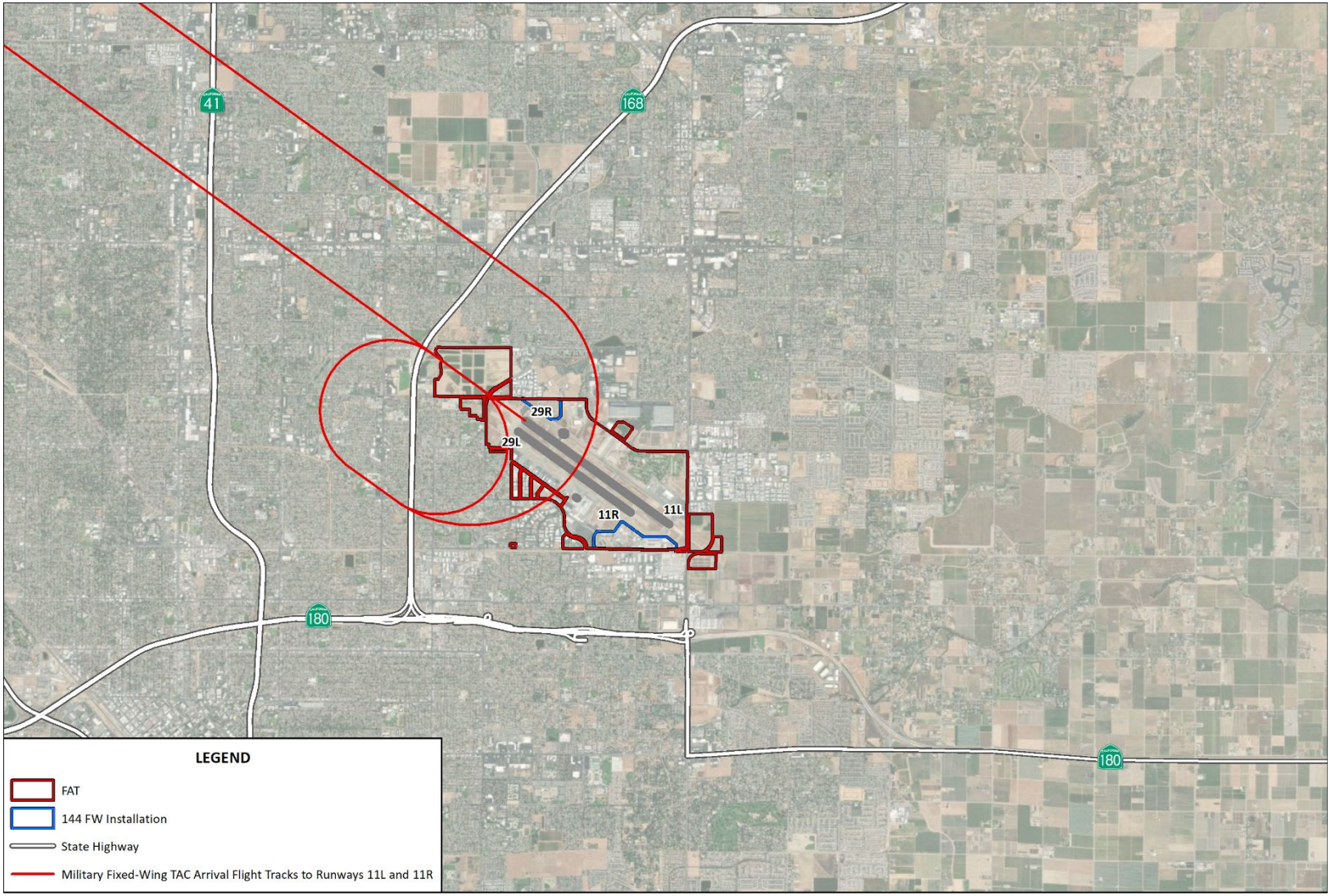
Military Helicopter Departure Flight Tracks at FAT



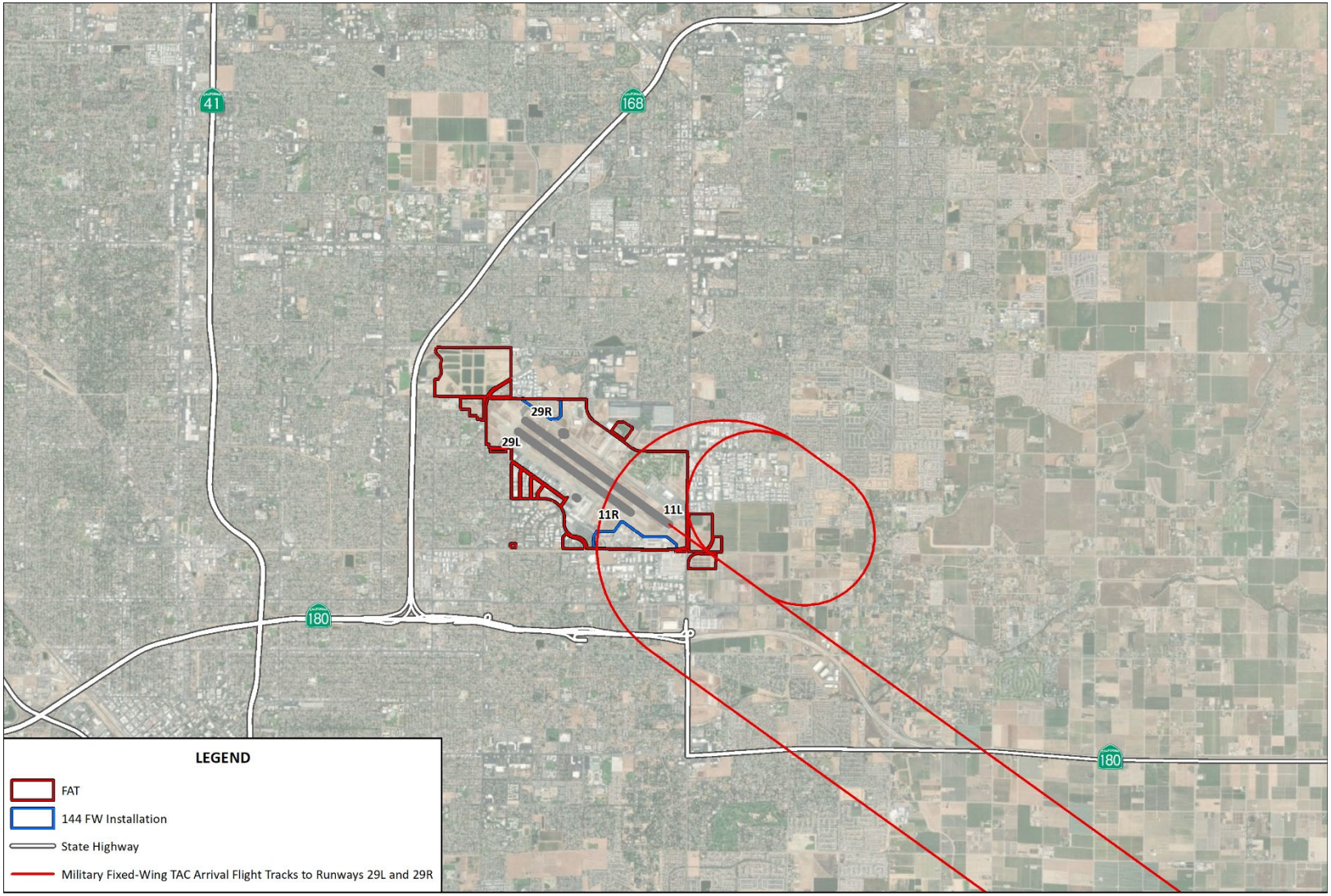
Military Fixed-Wing Straight In Flight Tracks at FAT

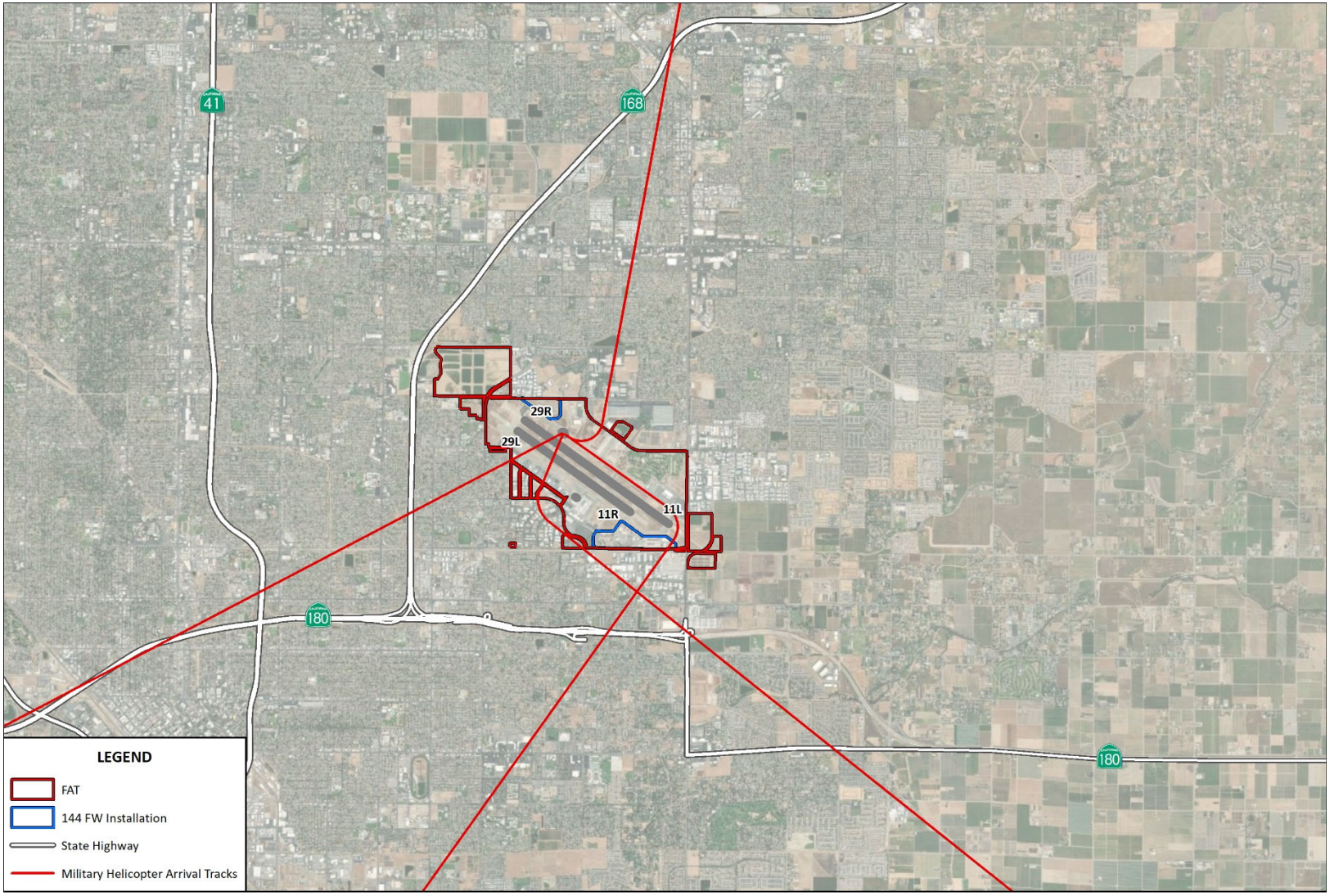

41
168
180
180
29R
29L
11R
11L
LEGEND
FAT
144 FW Installation
State Highway
Military Fixed-Wing Break Arrival Flight Tracks to Runways 11L and 11R
0 Kilometers 2
0 Miles 1
Military Fixed-Wing Break Arrival Flight Tracks to Runways 11L and 11R at FAT
N
W
E
S
Source: CA ANG 2022, ESRI 2022


41
168
180
180
29R
29L
11R
11L
LEGEND
FAT
144 FW Installation
State Highway
Military Fixed-Wing Break Arrival Flight Tracks to Runways 29L and 29R
0 Kilometers 2
0 Miles 1
Military Fixed-Wing Break Arrival Flight Tracks to Runways 29L and 29R at FAT
N
W
E
S
Source: CA ANG 2022, ESRI 2022

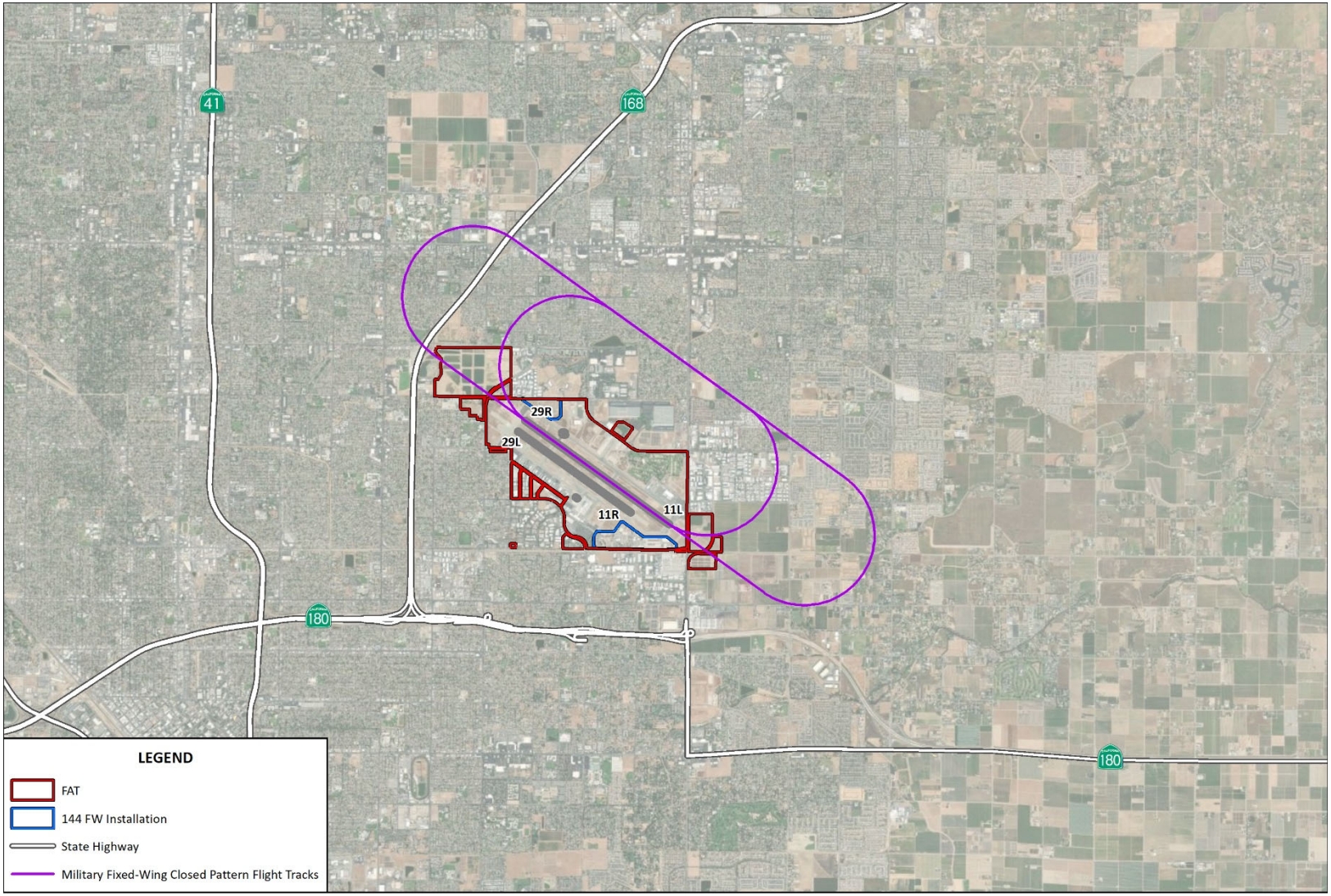


Military Fixed-Wing TAC Arrival Flight Tracks to Runways 11L and 11R at FAT

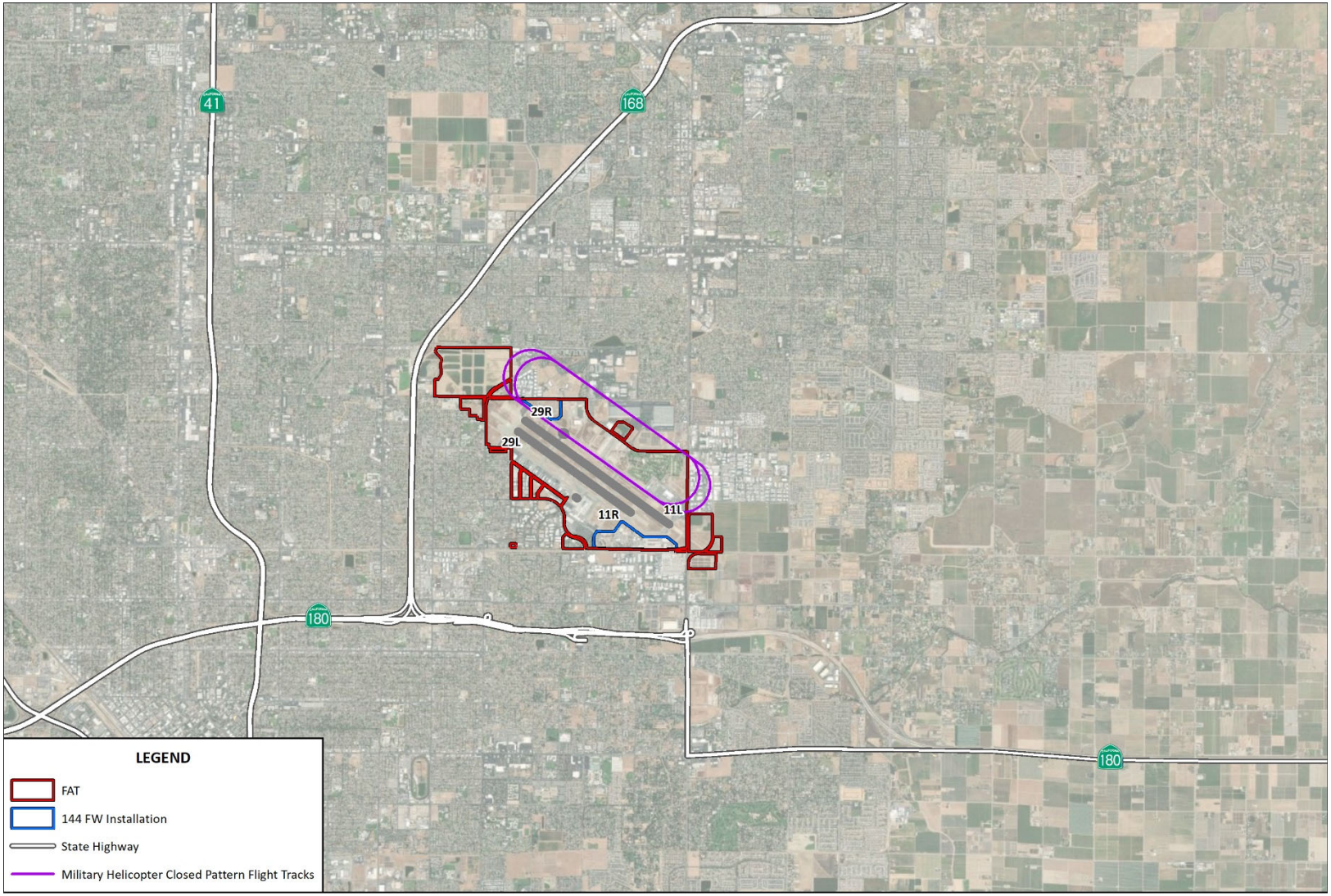

41
168
180
180
29R
29L
11R
11L
LEGEND
FAT
144 FW Installation
State Highway
Military Fixed-Wing TAC Arrival Flight Tracks to Runways 29L and 29R
0 Kilometers 2
0 Miles 1
Military Fixed-Wing TAC Arrival Flight Tracks to Runways 29L and 29R at FAT
N
W
E
S
Source: CA ANG 2022, ESRI 2022



Military Helicopter Arrival Tracks at FAT



Military Fixed-Wing Closed Pattern Flight Tracks at FAT



Military Helicopter Closed Pattern Flight Tracks at FAT

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F-15C Flight Profile Maps

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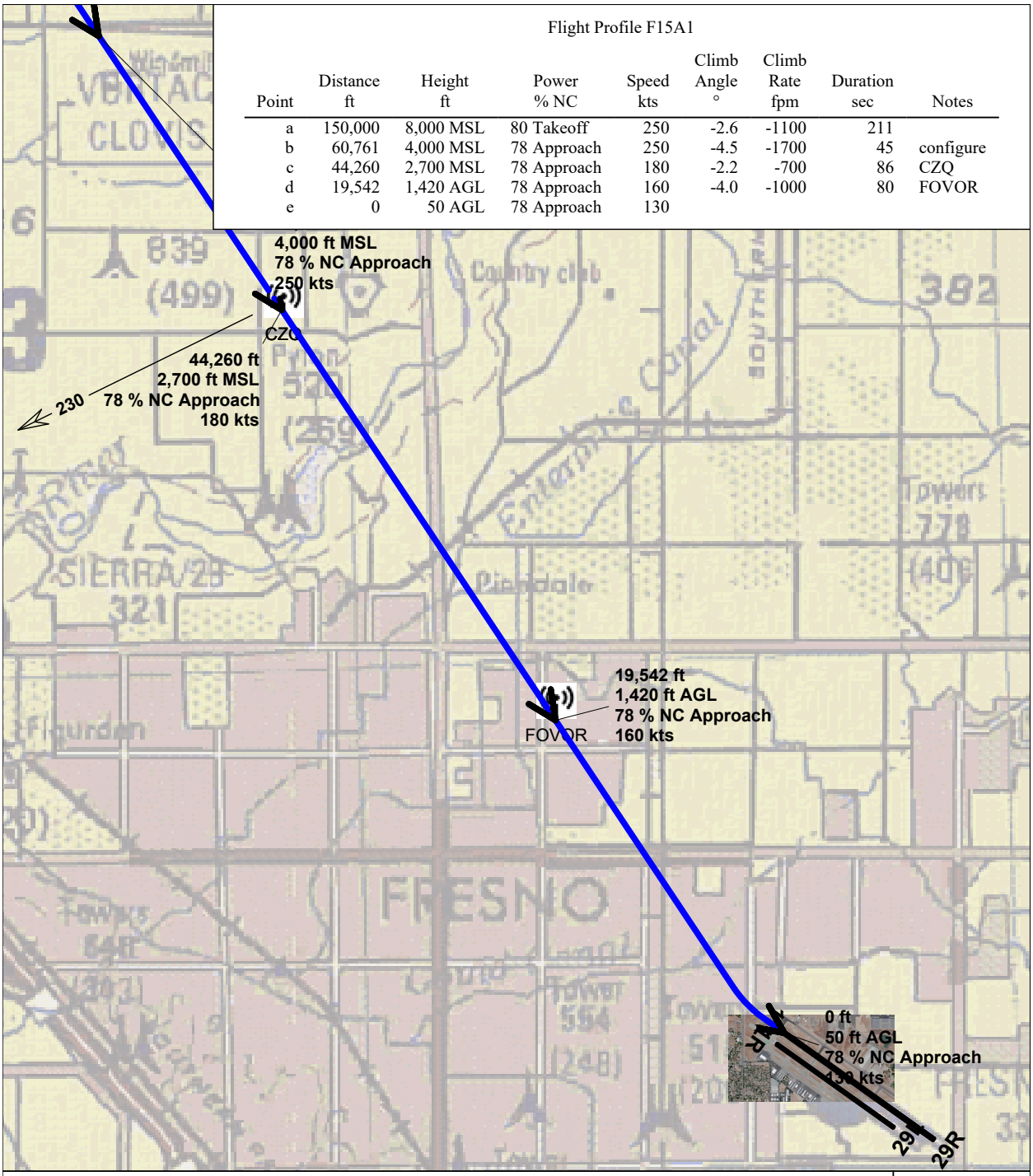
Flight Profile F15A1

Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	150,000	8,000 MSL	80 Takeoff	250	-2.6	-1100	211	
b	60,761	4,000 MSL	78 Approach	250	-4.5	-1700	45	configure
c	44,260	2,700 MSL	78 Approach	180	-2.2	-700	86	CZQ
d	19,542	1,420 AGL	78 Approach	160	-4.0	-1000	80	FOVOR
e	0	50 AGL	78 Approach	130				

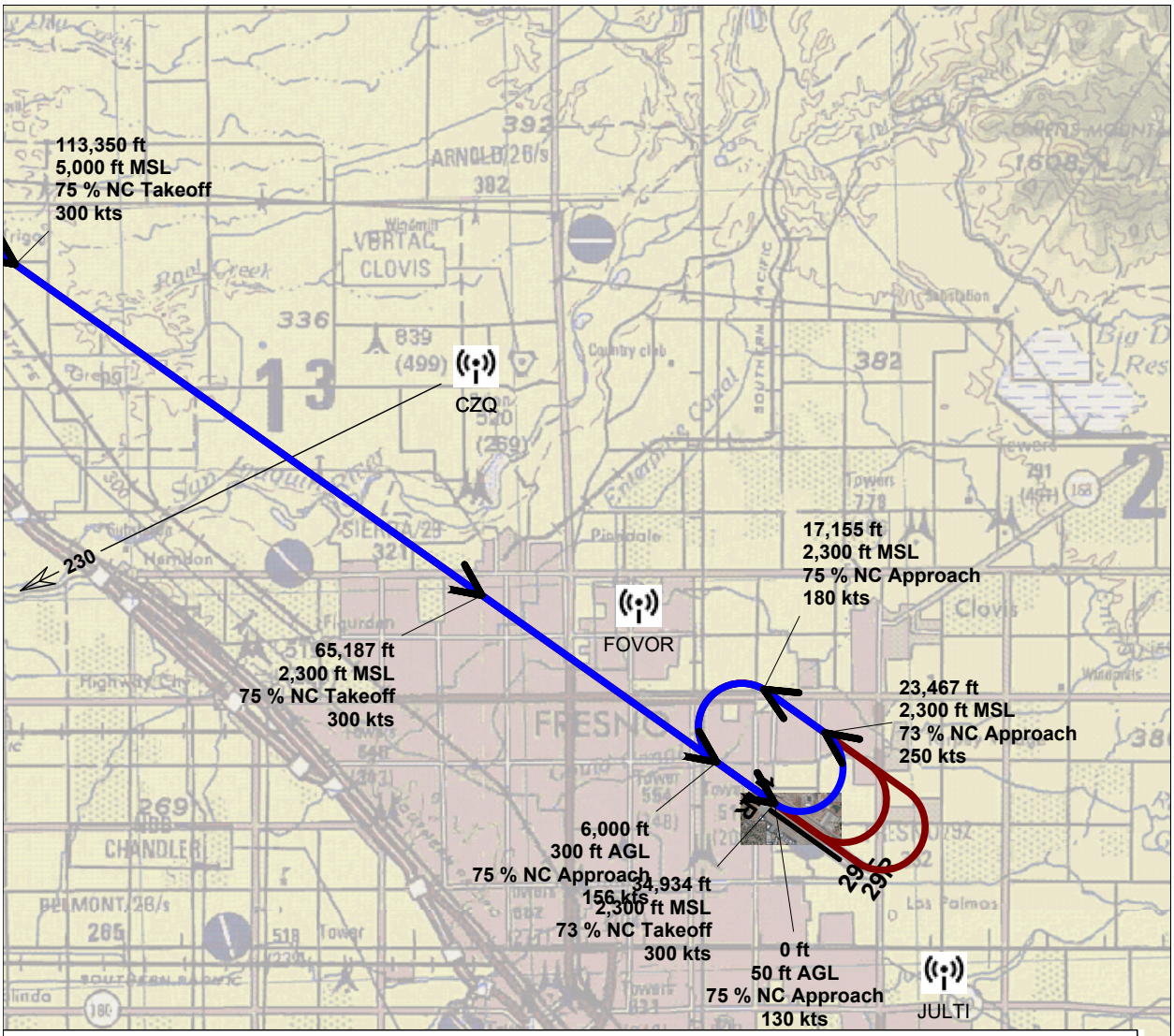


Flight Profile F15A1
TACAN
Flight Track: 11LA2 - TACAN rwy 11L Aircraft: F-15C F-15E Engine: F100-PW-220

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000

Scale in Feet 1:95,300 (1 inch = 7,940 feet)

N



Flight Profile F15-1L1

Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	75 Takeoff	300	-3.2	-1700	95	
b	65,187	2,300 MSL	75 Takeoff	300	0.0	0	60	initial
c	34,934	2,300 MSL	73 Takeoff	300	0.0	0	25	Break pt
d	23,467	2,300 MSL	73 Approach	250	0.0	0	17	Start downwind, begin to drop gear
e	17,155	2,300 MSL	75 Approach	180	-8.5	-2500	39	End downwind,
f	6,000	300 AGL	75 Approach	156	-2.4	-600	25	1nm final
g	0	50 AGL	75 Approach	130				

Flight Profile F15-1L1

1st ship break

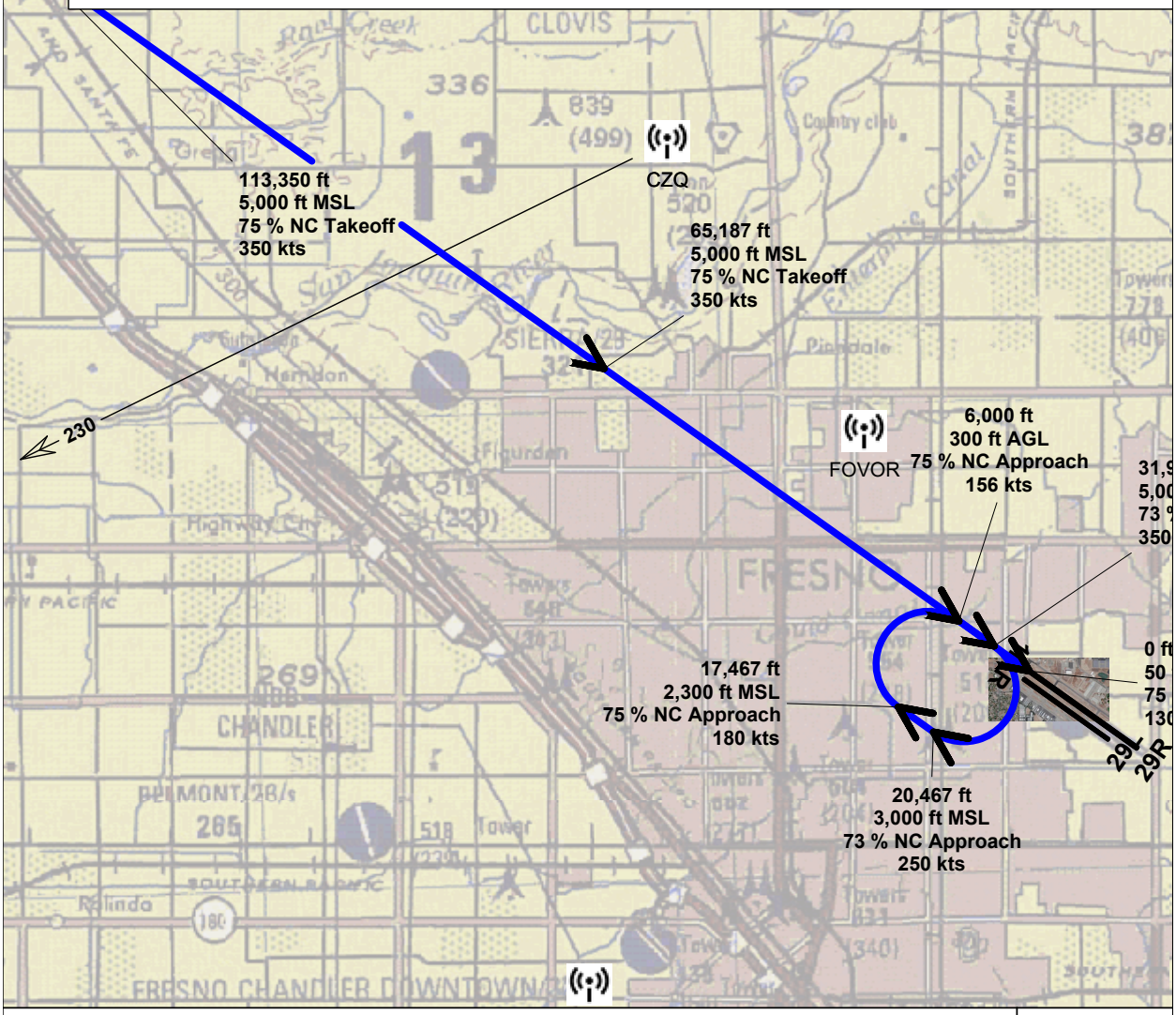
Flight Track: 11LO1 - Break Aircraft: F-15C F-15E Engine: F100-PW-220

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:182,000 (1 inch = 15,100 feet)

Flight Profile F15-1T1

Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	75 Takeoff	350	0.0	0	82	
b	65,187	5,000 MSL	75 Takeoff	350	0.0	0	56	initial
c	31,934	5,000 MSL	73 Takeoff	350	-9.9	-5300	23	begin constant descent to perch
d	20,467	3,000 MSL	73 Approach	250	-13.1	-5100	8	begin to drop gear
e	17,467	2,300 MSL	75 Approach	180	-8.3	-2500	40	Perch point
f	6,000	300 AGL	75 Approach	156	-2.4	-600	25	1nm final
g	0	50 AGL	75 Approach	130				



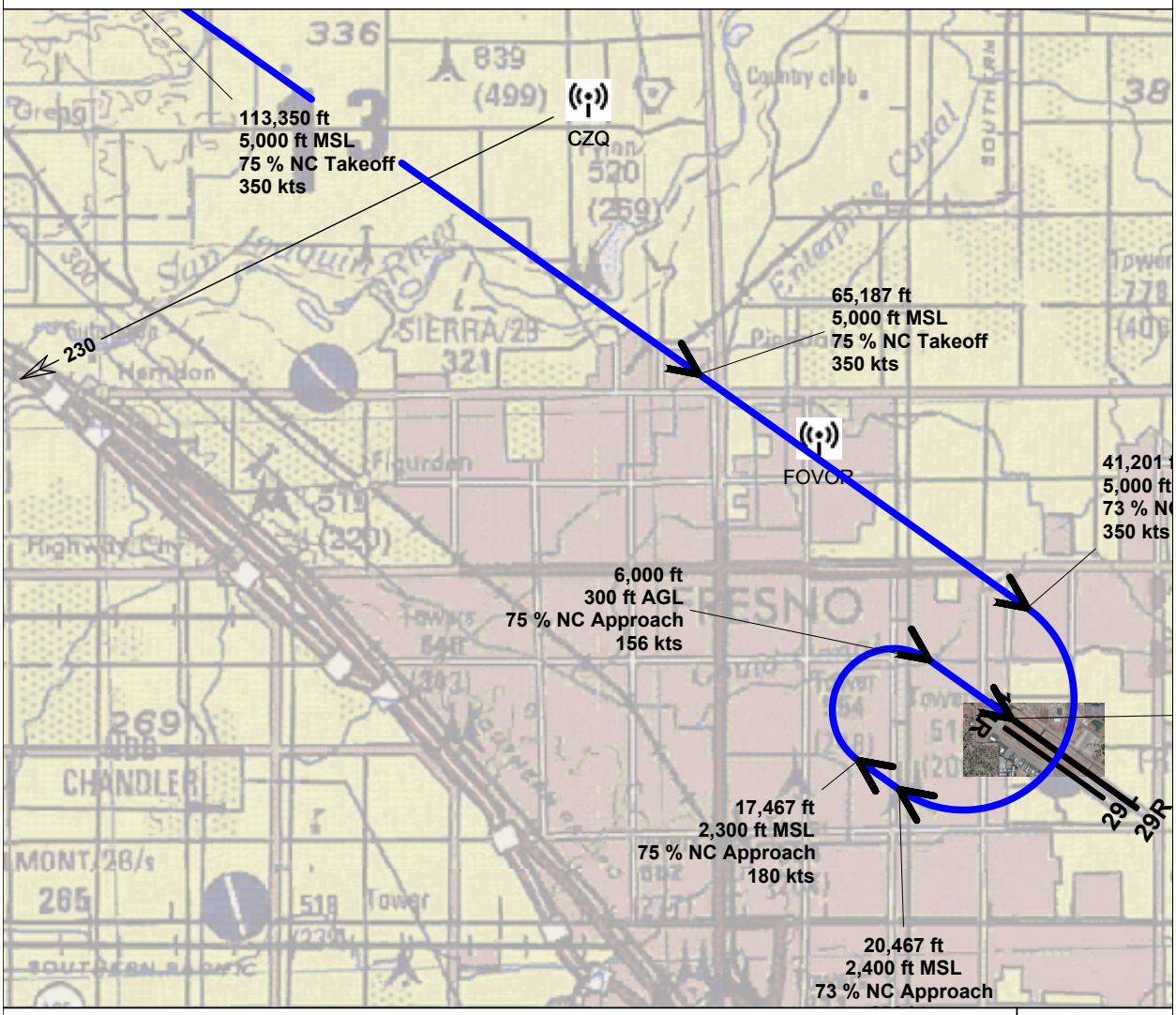
Flight Profile F15-1T1
1st ship
Flight Track: 11LTAC1 - TAC Initial - Lead Aircraft: F-15C F-15E Engine: F100-PW-220

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000 52,000

Scale in Feet 1:150,000 (1 inch = 12,500 feet)

Flight Profile F15-1T2

Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	75 Takeoff	350	0.0	0	82	
b	65,187	5,000 MSL	75 Takeoff	350	0.0	0	41	initial
c	41,201	5,000 MSL	73 Takeoff	350	-7.1	-3800	41	begin constant descent to perch
d	20,467	2,400 MSL	73 Approach	250	-1.9	-700	8	begin to drop gear, level off for downwind
e	17,467	2,300 MSL	75 Approach	180	-8.3	-2500	40	Perch point
f	6,000	300 AGL	75 Approach	156	-2.4	-600	25	1nm final
g	0	50 AGL	75 Approach	130				



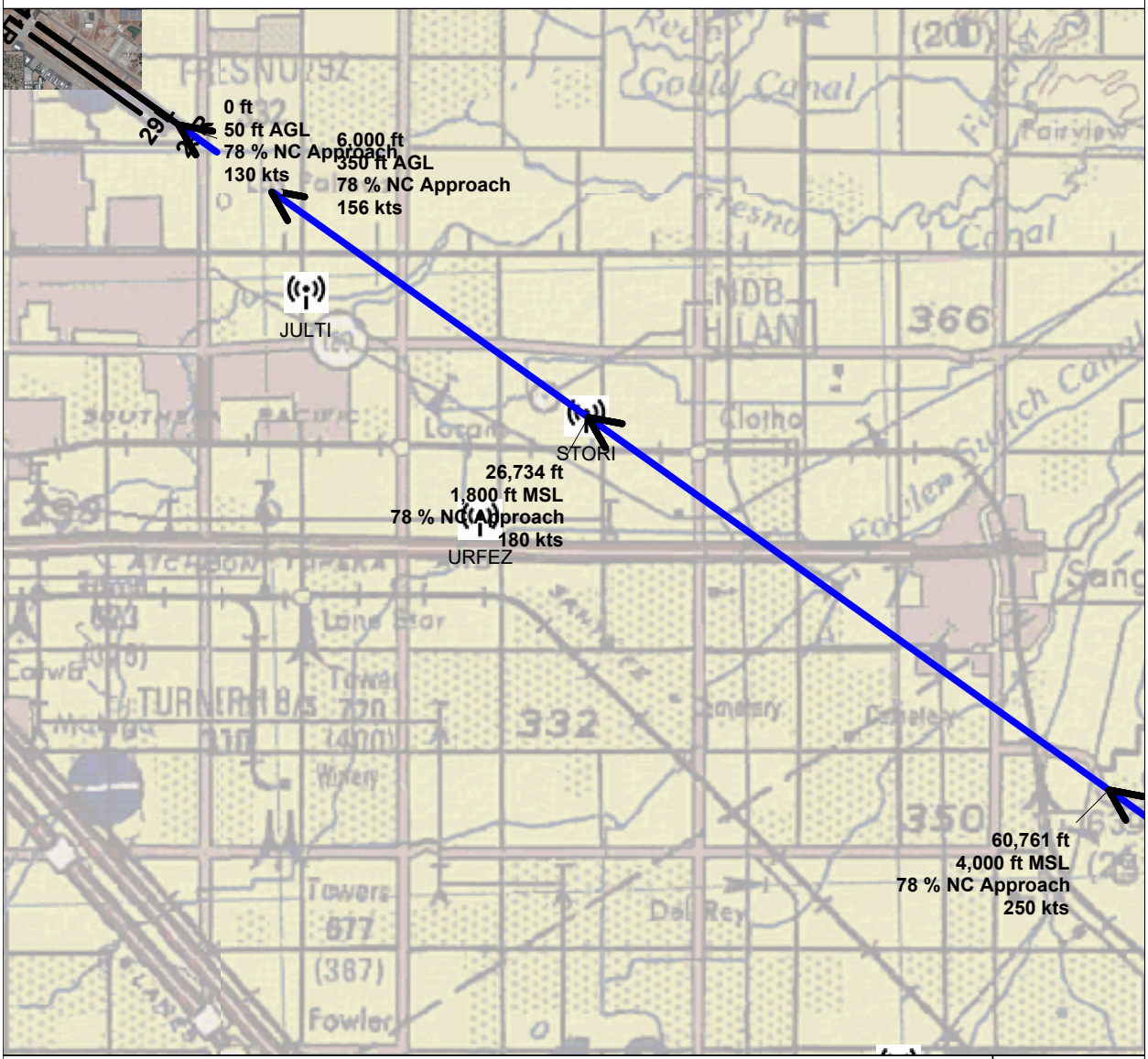
Flight Profile F15-1T2
Wing
Flight Track: 11LTAC2 - TAC Initial - Wing Aircraft: F-15C F-15E Engine: F100-PW-220

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000

Scale in Feet 1:129,000 (1 inch = 10,700 feet)

Flight Profile F15A4

Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	150,000	8,000 MSL	80 Takeoff	250	-2.6	-1100	211	
b	60,761	4,000 MSL	78 Approach	250	-3.7	-1400	94	configure, between 2800 and 6000' at SANGC
c	26,734	1,800 MSL	78 Approach	180	-3.1	-900	73	STORI
d	6,000	350 AGL	78 Approach	156	-2.9	-700	25	
e	0	50 AGL	78 Approach	130				

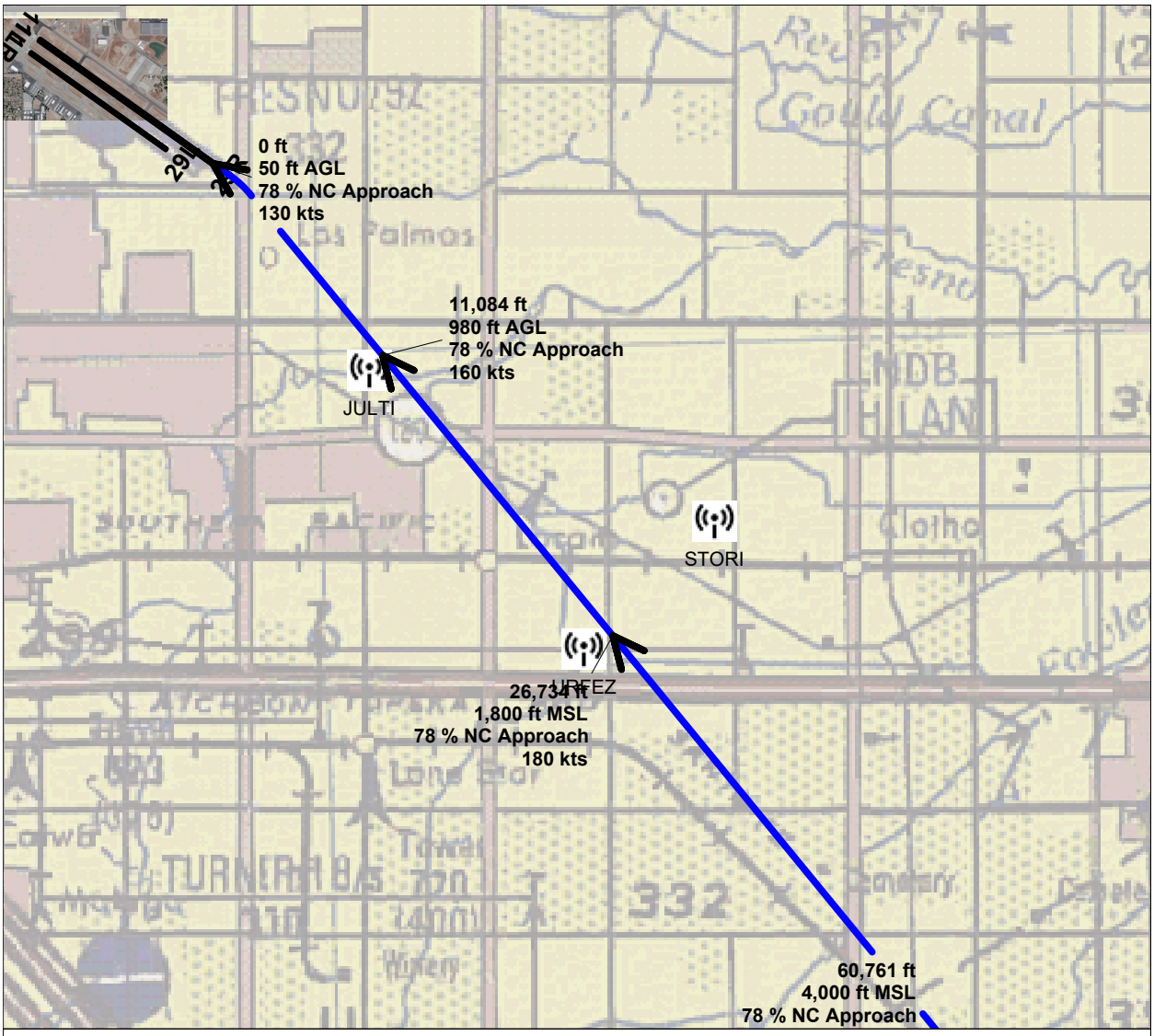


Flight Profile F15A4

ILS

Flight Track: 29RA1 - STRAIGHT IN Aircraft: F-15C F-15E Engine: F100-PW-220

Scale in Feet 1:112,000 (1 inch = 9,340 feet)



Flight Profile F15A5

Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	150,000	8,000 MSL	80 Takeoff	250	-2.6	-1100	211	
b	60,761	4,000 MSL	78 Approach	250	-3.7	-1400	94	configure, between 2000 and 6000' at IXDEB
c	26,734	1,800 MSL	78 Approach	180	-1.8	-500	55	URFEZ
d	11,084	980 AGL	78 Approach	160	-4.8	-1200	45	
e	0	50 AGL	78 Approach	130				

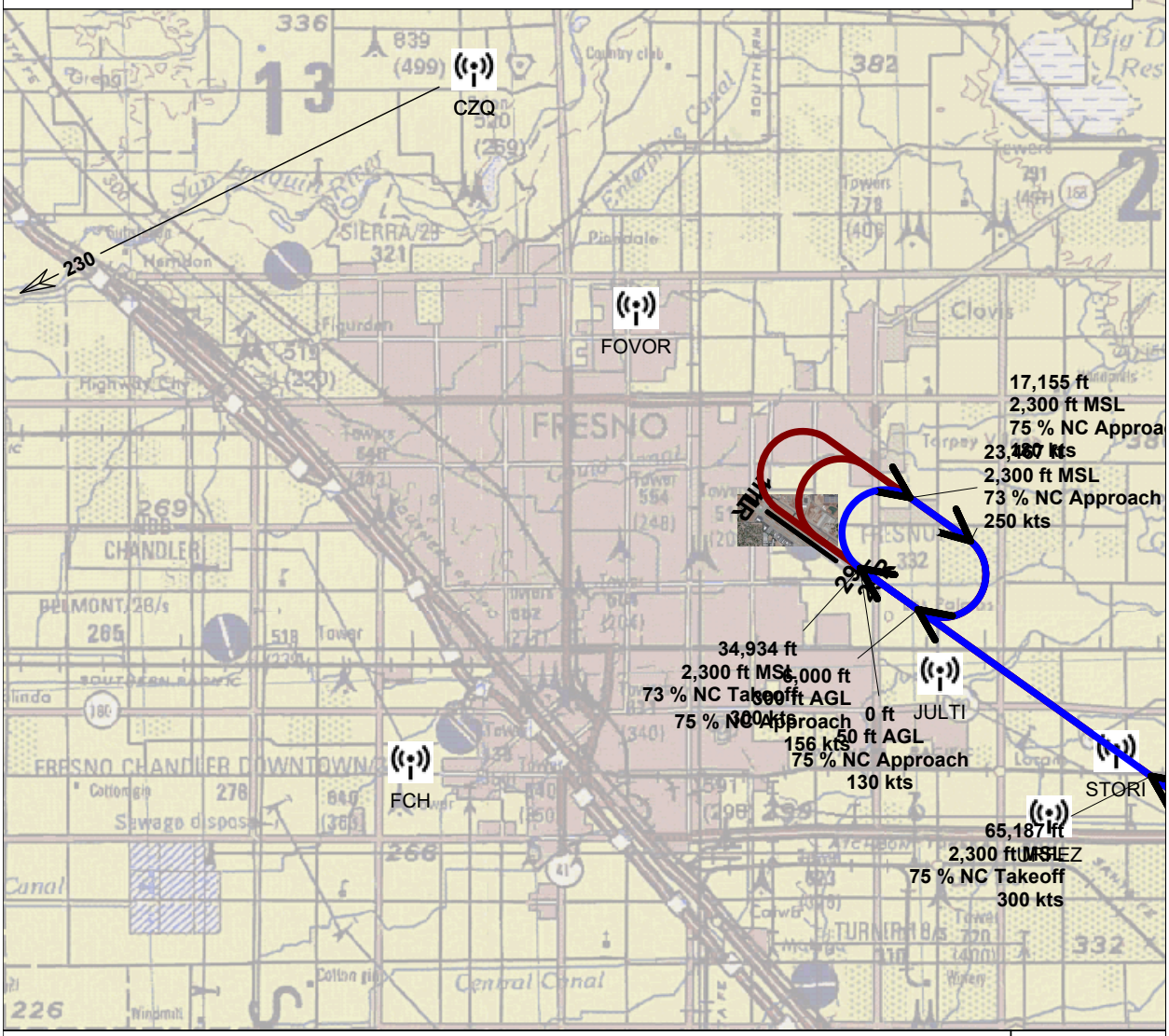
Flight Profile F15A5
TACAN
Flight Track: 29RA3 - ARRIVAL RUNWAY 29R TACAN Aircraft: F-15C F-15E Engine: F100-PW-220

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000

Scale in Feet 1:91,600 (1 inch = 7,630 feet)

Flight Profile F15-9R1

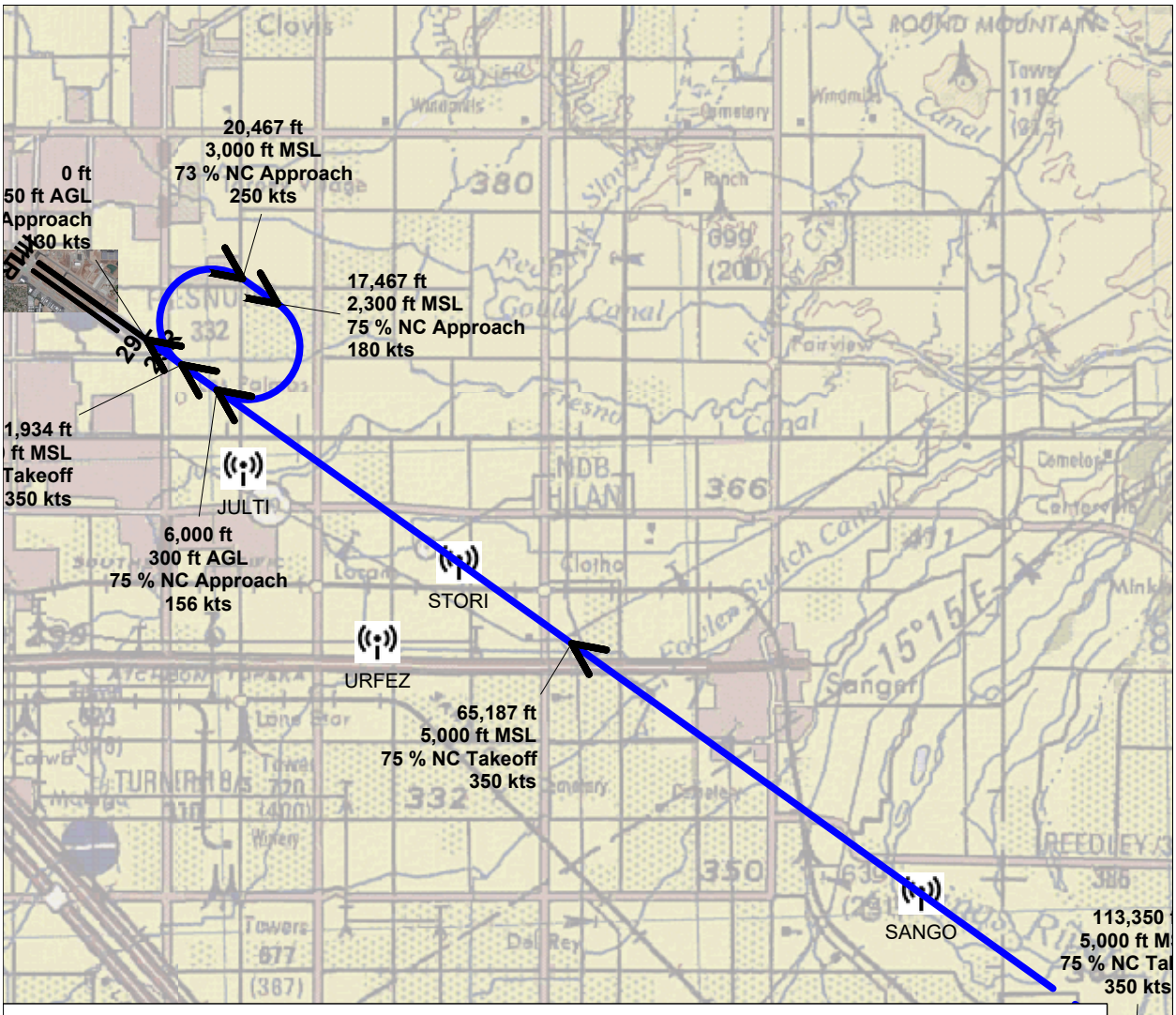
Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	75 Takeoff	300	-3.2	-1700	95	
b	65,187	2,300 MSL	75 Takeoff	300	0.0	0	60	initial
c	34,934	2,300 MSL	73 Takeoff	300	0.0	0	25	Break pt
d	23,467	2,300 MSL	73 Approach	250	0.0	0	17	Start downwind, begin to drop gear
e	17,155	2,300 MSL	75 Approach	180	-8.5	-2500	39	End downwind,
f	6,000	300 AGL	75 Approach	156	-2.4	-600	25	1nm final
g	0	50 AGL	75 Approach	130				



Flight Profile F15-9R1
1st ship break
Flight Track: 29RO1 - Break Aircraft: F-15C F-15E Engine: F100-PW-220

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:182,000 (1 inch = 15,100 feet)



Flight Profile F15-9T1

Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	75 Takeoff	350	0.0	0	82	
b	65,187	5,000 MSL	75 Takeoff	350	0.0	0	56	initial
c	31,934	5,000 MSL	73 Takeoff	350	-9.9	-5300	23	begin constant descent to perch
d	20,467	3,000 MSL	73 Approach	250	-13.1	-5100	8	begin to drop gear
e	17,467	2,300 MSL	75 Approach	180	-8.3	-2500	40	Perch point
f	6,000	300 AGL	75 Approach	156	-2.4	-600	25	1nm final
g	0	50 AGL	75 Approach	130				

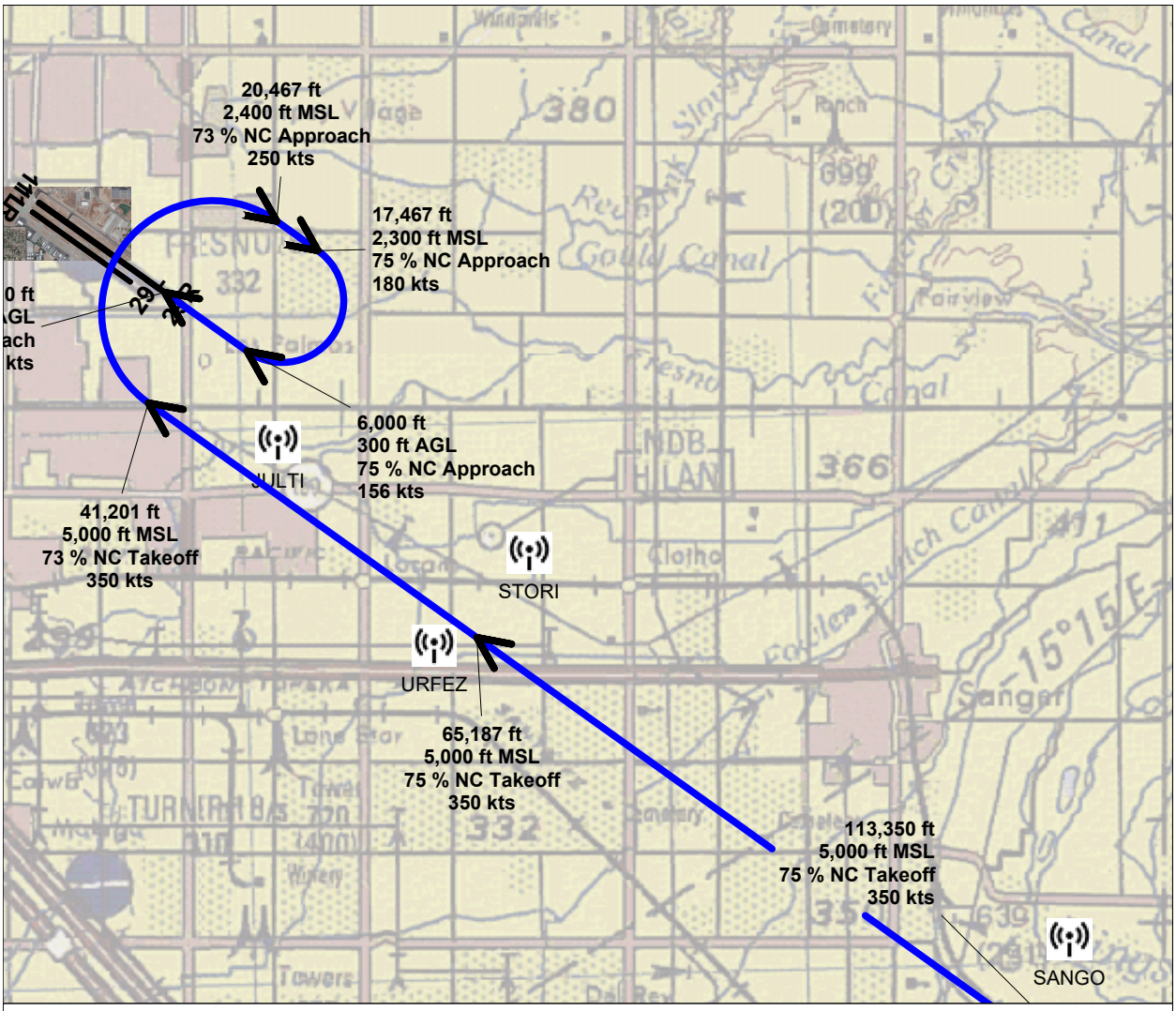
Flight Profile F15-9T1

1st ship

Flight Track: 29RTAC1 - TAC Initial - Lead Aircraft: F-15C F-15E Engine: F100-PW-220

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000 52,000

Scale in Feet 1:150,000 (1 inch = 12,500 feet)



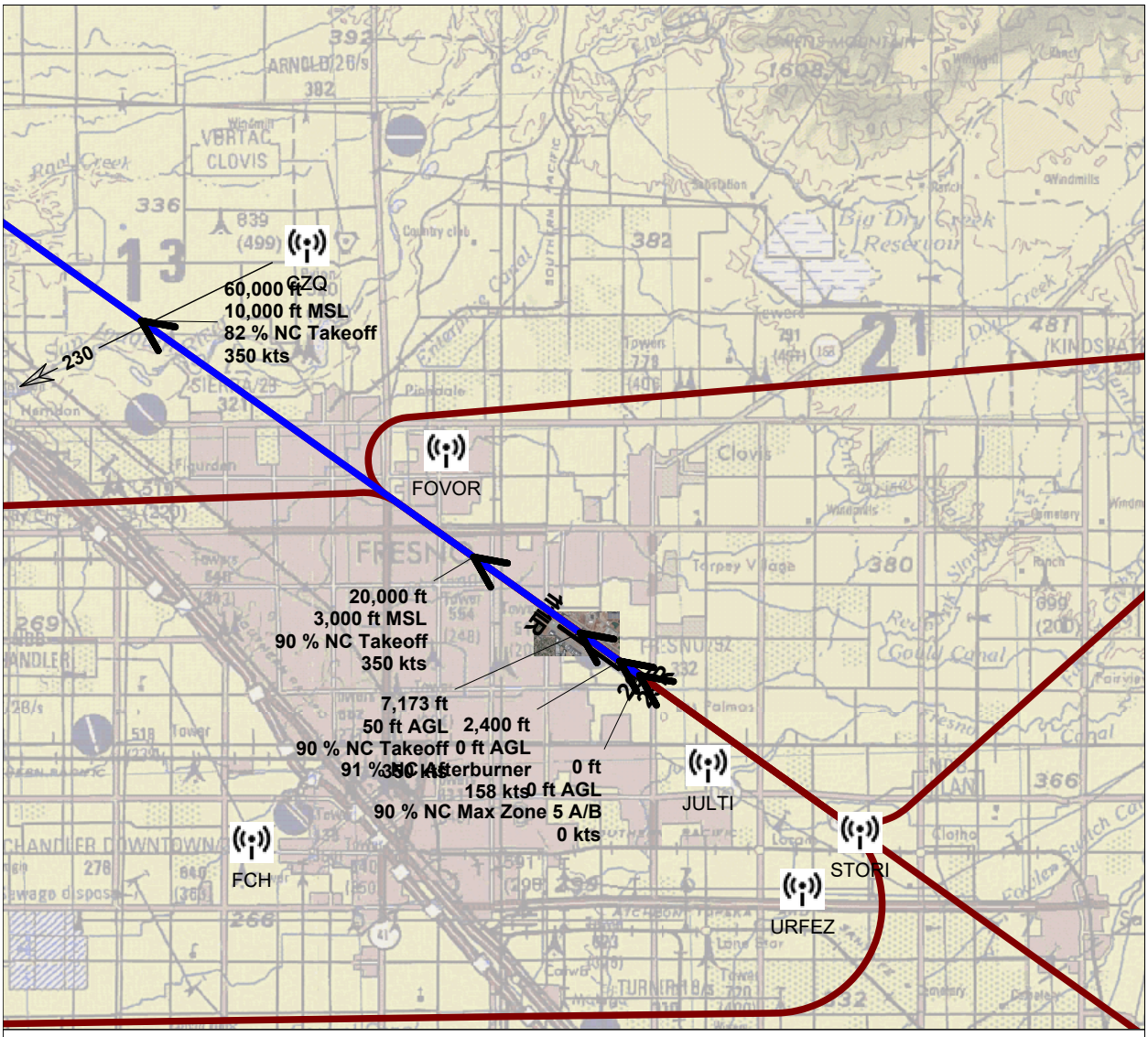
Flight Profile F15-9T2

Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	75 Takeoff	350	0.0	0	82	
b	65,187	5,000 MSL	75 Takeoff	350	0.0	0	41	initial
c	41,201	5,000 MSL	73 Takeoff	350	-7.1	-3800	41	begin constant descent to perch
d	20,467	2,400 MSL	73 Approach	250	-1.9	-700	8	begin to drop gear, level off for downwind
e	17,467	2,300 MSL	75 Approach	180	-8.3	-2500	40	Perch point
f	6,000	300 AGL	75 Approach	156	-2.4	-600	25	1nm final
g	0	50 AGL	75 Approach	130				

Flight Profile F15-9T2
Wing
Flight Track: 29RTAC2 - TAC Initial - Wing Aircraft: F-15C F-15E Engine: F100-PW-220

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000

Scale in Feet 1:128,000 (1 inch = 10,700 feet)



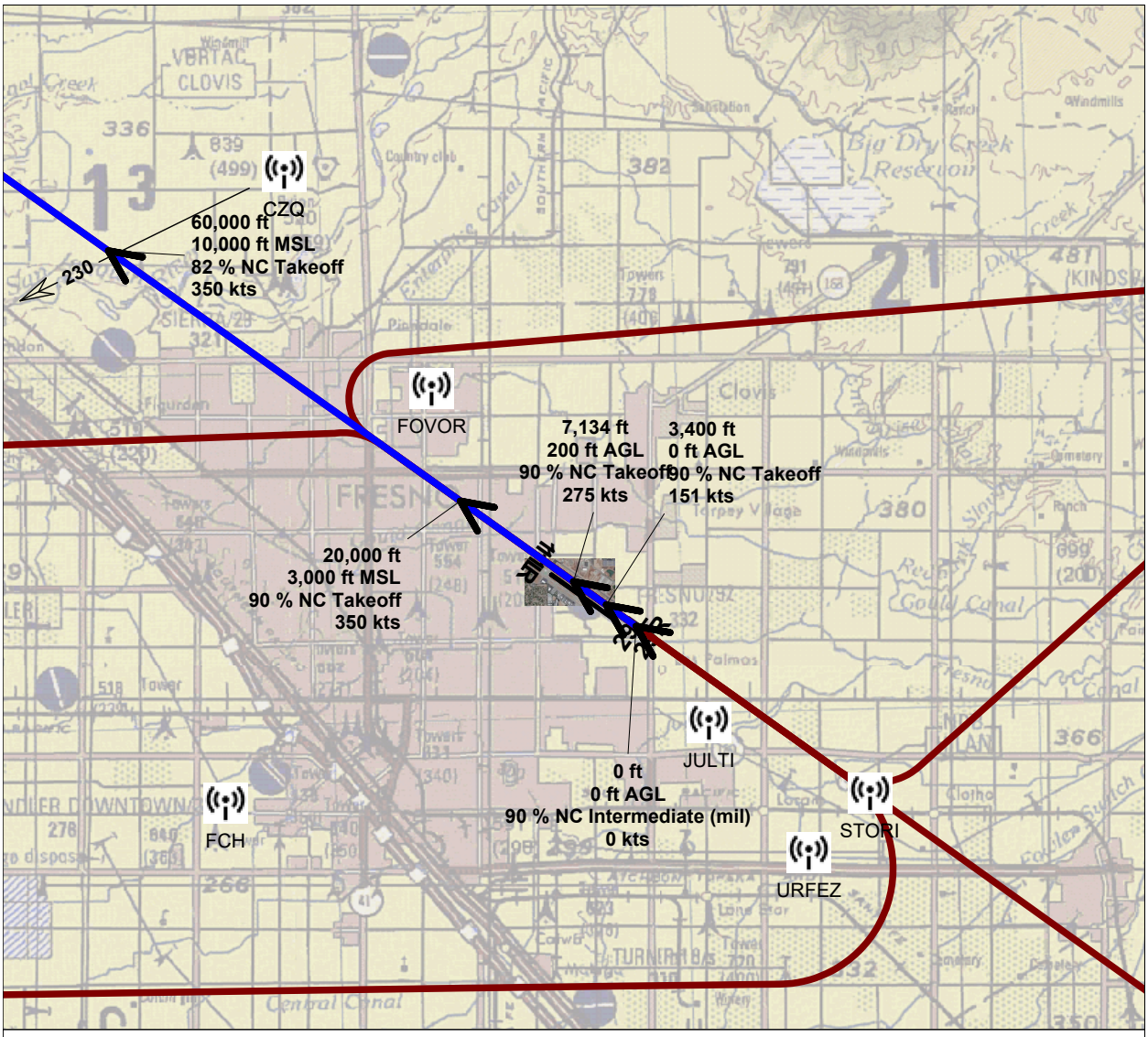
Flight Profile F15-D10A

Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	0	0 AGL	90 Max Zone 5 A/B	0	0.0	0	18	
b	2,400	0 AGL	91 Afterburner	158	0.6	300	11	
c	7,173	50 AGL	90 Takeoff	350	11.5	7200	22	
d	20,000	3,000 MSL	90 Takeoff	350	9.9	6200	68	Continue climb at 6000 fpm to at leas
e	60,000	10,000 MSL	82 Takeoff	350	8.5	5300	68	
f	100,000	16,000 MSL	82 Takeoff	350				

Flight Profile F15-D10A
AB Departure cleared to climb
Flight Track: 29RD1 Aircraft: F-15C F-15E Engine: F100-PW-220

0 10,000 20,000 30,000 40,000 50,000 60,000

Scale in Feet 1:207,000 (1 inch = 17,300 feet)



Flight Profile F15-D10M

Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	0	0 AGL	90 Intermediate (mil)	0	0.0	0	27	
b	3,400	0 AGL	90 Takeoff	151	3.1	1200	10	
c	7,134	200 AGL	90 Takeoff	275	10.8	6100	24	
d	20,000	3,000 MSL	90 Takeoff	350	9.9	6200	68	Continue climb at 6000 fpm to at lea
e	60,000	10,000 MSL	82 Takeoff	350	8.5	5300	68	
f	100,000	16,000 MSL	82 Takeoff	350				

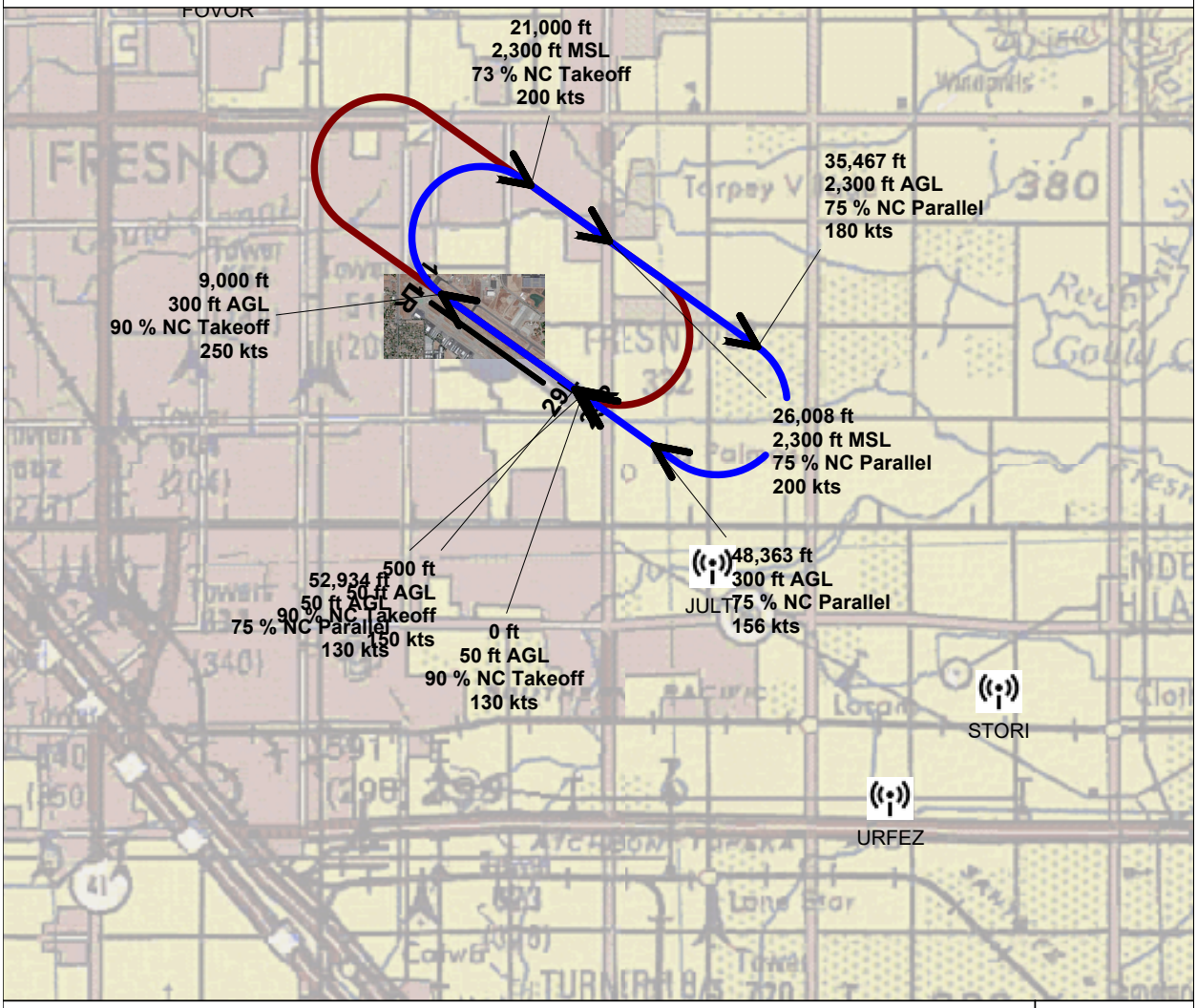
Flight Profile F15-D10M
Mil Departure cleared to climb
Flight Track: 29RD1 Aircraft: F-15C F-15E Engine: F100-PW-220

0 10,000 20,000 30,000 40,000 50,000 60,000

Scale in Feet 1:195,000 (1 inch = 16,300 feet)

Flight Profile F15-C2

Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	0	50 AGL	90 Takeoff	130	0.0	0	2	
b	500	50 AGL	90 Takeoff	150	1.7	600	25	
c	9,000	300 AGL	90 Takeoff	250	7.9	3200	32	
d	21,000	2,300 MSL	73 Takeoff	200	0.0	0	15	
e	26,008	2,300 MSL	75 Parallel	200	2.0	700	29	Gear down
f	35,467	2,300 AGL	75 Parallel	180	-8.8	-2600	45	Beyond approach extrap limit, using Takeoff
g	48,363	300 AGL	75 Parallel	156	-3.1	-800	19	
h	52,934	50 AGL	75 Parallel	130				



Flight Profile F15-C2
closed pattern
Flight Track: 29RCP1 - LOW APPROACH RUNWAY 29R TRACK 1 Aircraft: F-15C
F-15E Engine: F100-PW-220

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000

Scale in Feet 1:114,000 (1 inch = 9,530 feet)

F-15EX Flight Profile Maps

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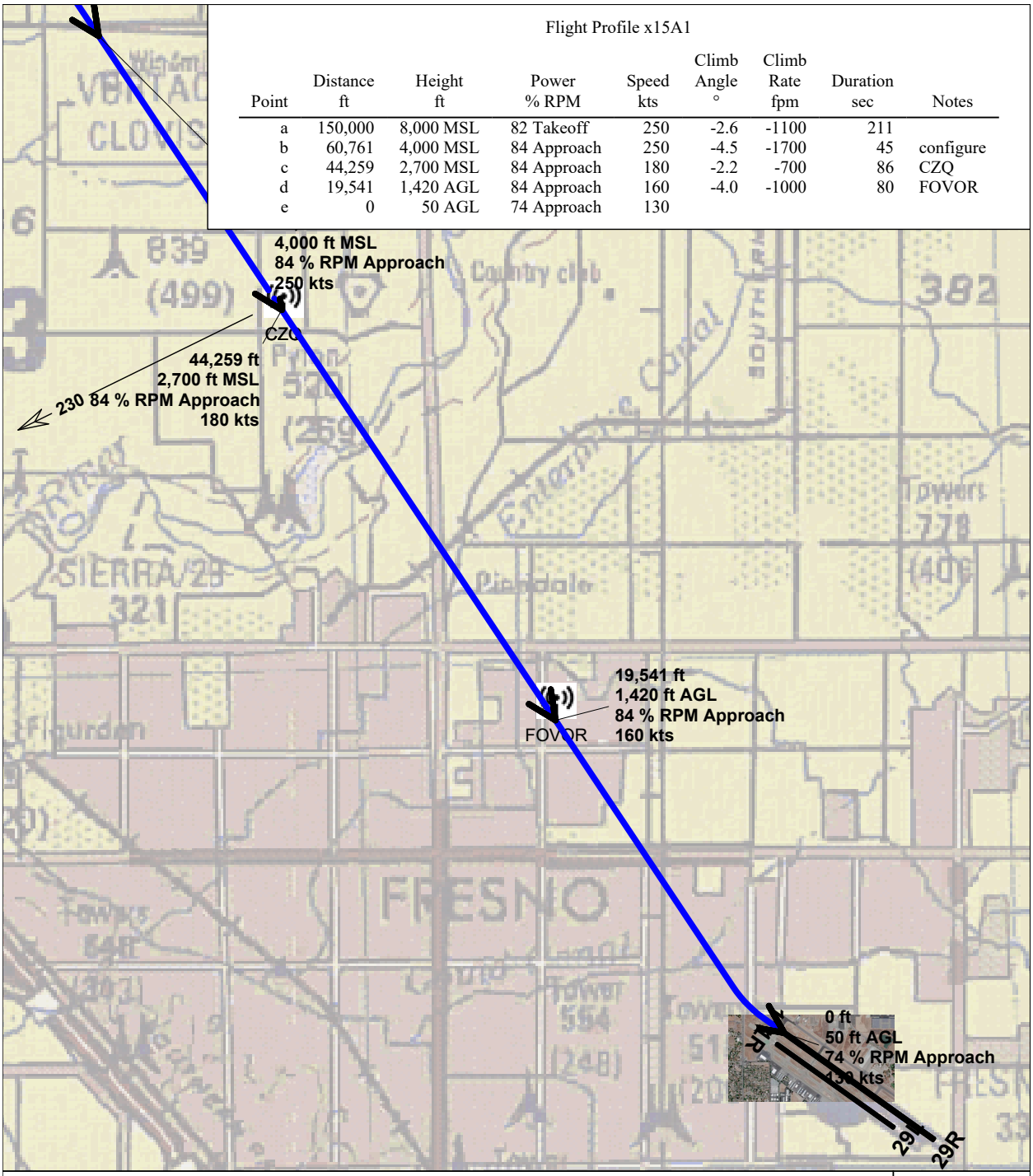


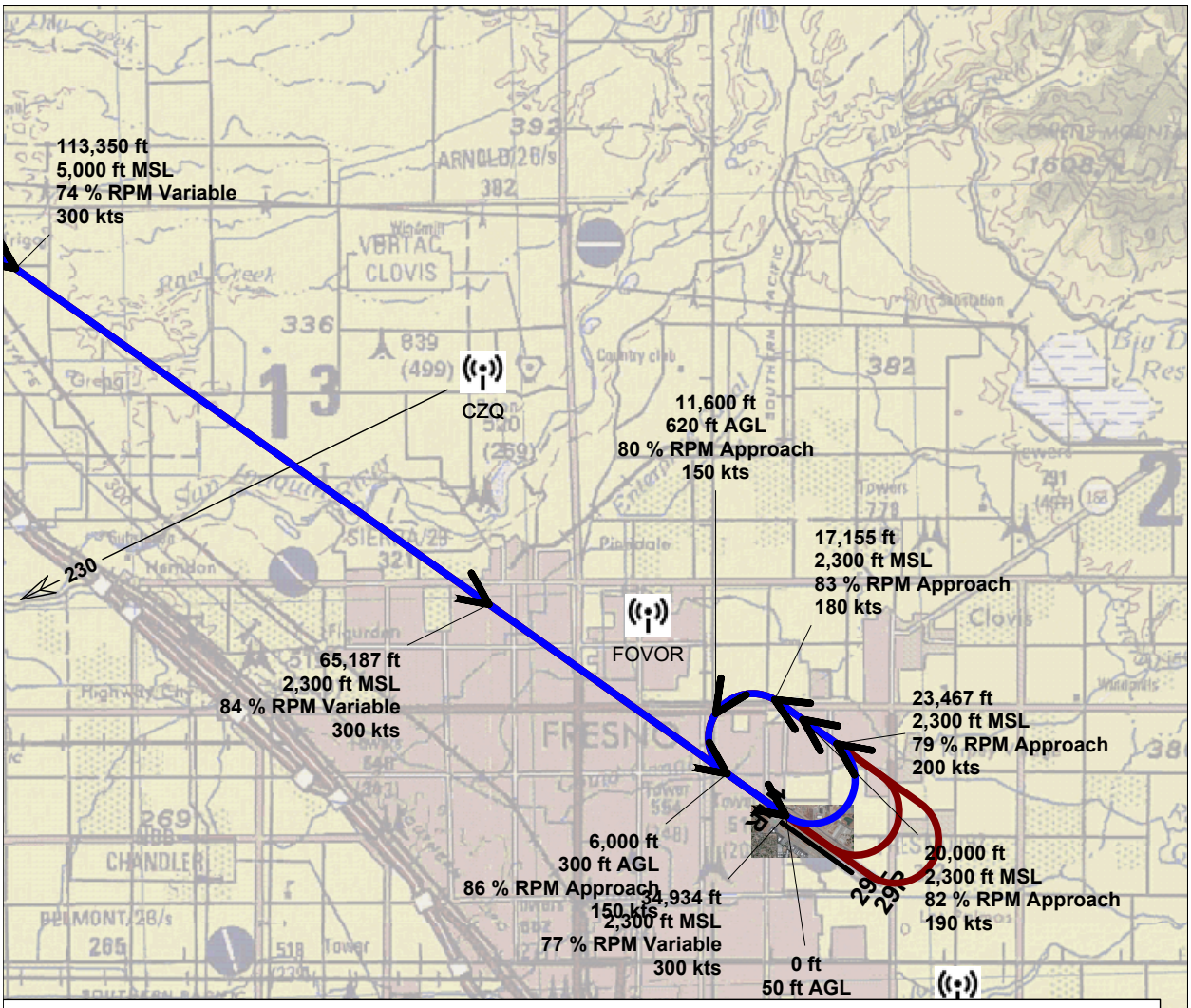
Flight Profile x15A1

TACAN

Flight Track: 11LA2 - TACAN rwy 11L Aircraft: F-15EX F-15EX Engine: F110-GE-129

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000

Scale in Feet 1:95,300 (1 inch = 7,940 feet)



Flight Profile x15-1L1

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	74 Variable	300	-3.2	-1700	95	
b	65,187	2,300 MSL	84 Variable	300	0.0	0	60	initial
c	34,934	2,300 MSL	77 Variable	300	0.0	0	27	Break pt
d	23,467	2,300 MSL	79 Approach	200	0.0	0	11	Start downwind, begin to drop gear
e	20,000	2,300 MSL	82 Approach	190	0.0	0	9	End downwind,
f	17,155	2,300 MSL	83 Approach	180	-13.6	-4000	20	End downwind,
g	11,600	620 AGL	80 Approach	150	-3.3	-900	22	1nm final
h	6,000	300 AGL	86 Approach	150	-2.4	-600	25	1nm final
i	0	50 AGL	74 Approach	130				

Flight Profile x15-1L1

1st ship break

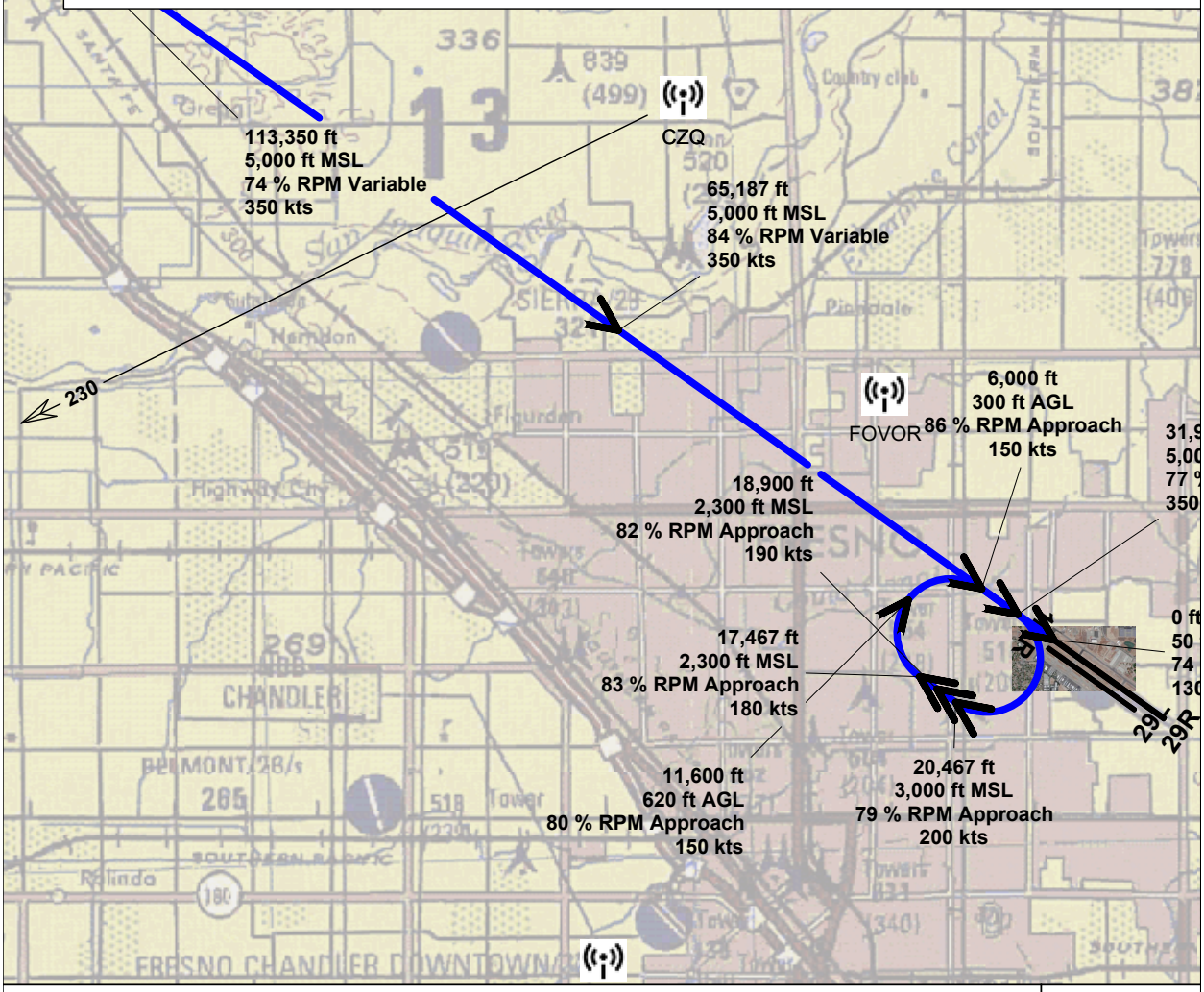
Flight Track: 11LO1 - Break Aircraft: F-15EX F-15EX Engine: F110-GE-129

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:182,000 (1 inch = 15,100 feet)

Flight Profile x15-1T1

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	74 Variable	350	0.0	0	82	
b	65,187	5,000 MSL	84 Variable	350	0.0	0	56	initial
c	31,934	5,000 MSL	77 Variable	350	-9.9	-4900	25	begin constant descent to perch
d	20,467	3,000 MSL	79 Approach	200	-24.1	-8800	5	begin to drop gear
e	18,900	2,300 MSL	82 Approach	190	0.0	0	5	Perch point
f	17,467	2,300 MSL	83 Approach	180	-12.9	-3800	21	Perch point
g	11,600	620 AGL	80 Approach	150	-3.3	-900	22	1nm final
h	6,000	300 AGL	86 Approach	150	-2.4	-600	25	1nm final
i	0	50 AGL	74 Approach	130				



Flight Profile x15-1T1

1st ship

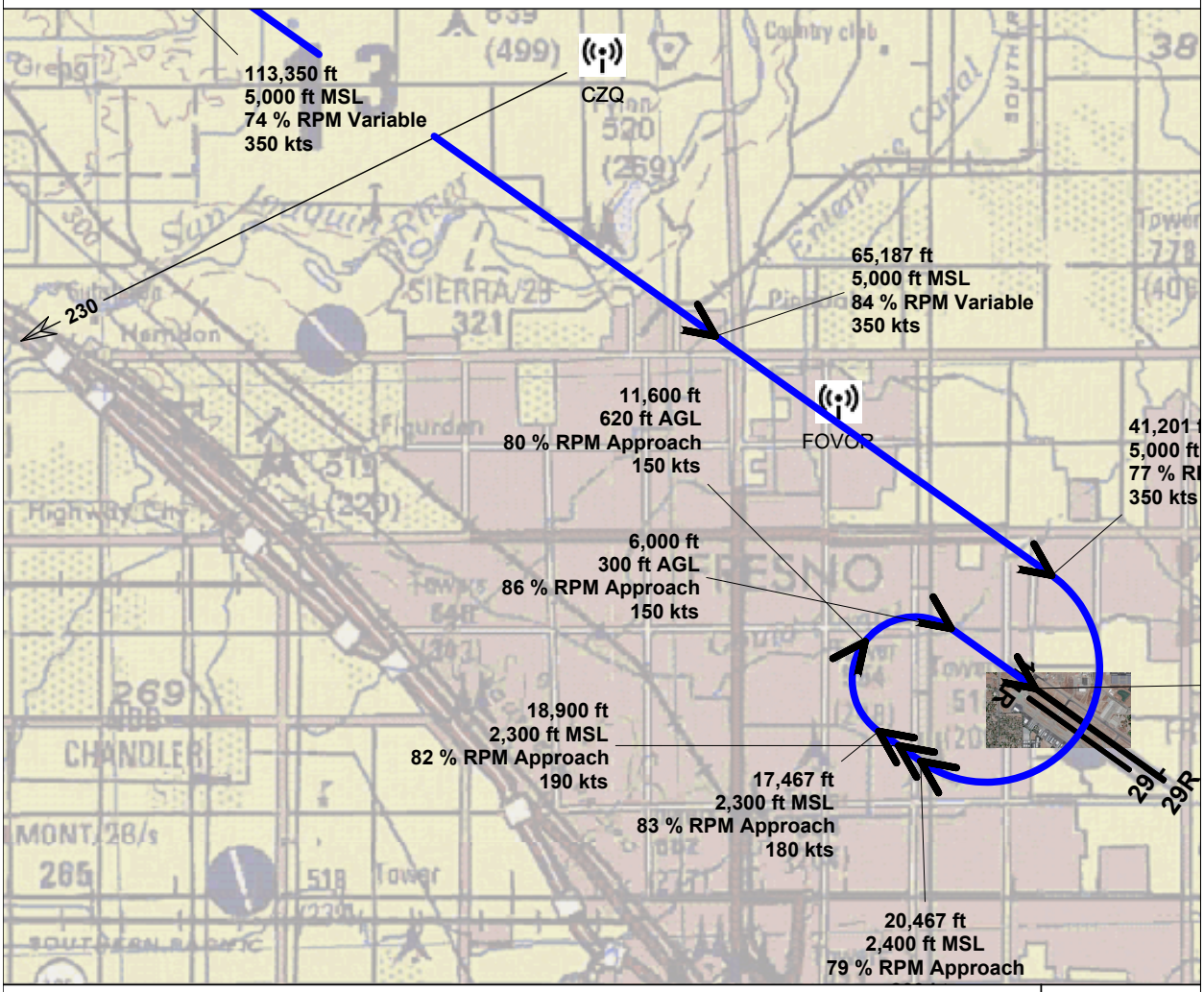
Flight Track: 11LTAC1 - TAC Initial - Lead Aircraft: F-15EX F-15EX Engine: F110-GE-129

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000 52,000

Scale in Feet 1:150,000 (1 inch = 12,500 feet)

Flight Profile x15-1T2

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	74 Variable	350	0.0	0	82	
b	65,187	5,000 MSL	84 Variable	350	0.0	0	41	initial
c	41,201	5,000 MSL	77 Variable	350	-7.1	-3500	45	begin constant descent to perch
d	20,467	2,400 MSL	79 Approach	200	-3.7	-1300	5	begin to drop gear, level off for downwind
e	18,900	2,300 MSL	82 Approach	190	0.0	0	5	Perch point
f	17,467	2,300 MSL	83 Approach	180	-12.9	-3800	21	Perch point
g	11,600	620 AGL	80 Approach	150	-3.3	-900	22	1nm final
h	6,000	300 AGL	86 Approach	150	-2.4	-600	25	1nm final
i	0	50 AGL	74 Approach	130				



Flight Profile x15-1T2

Wing

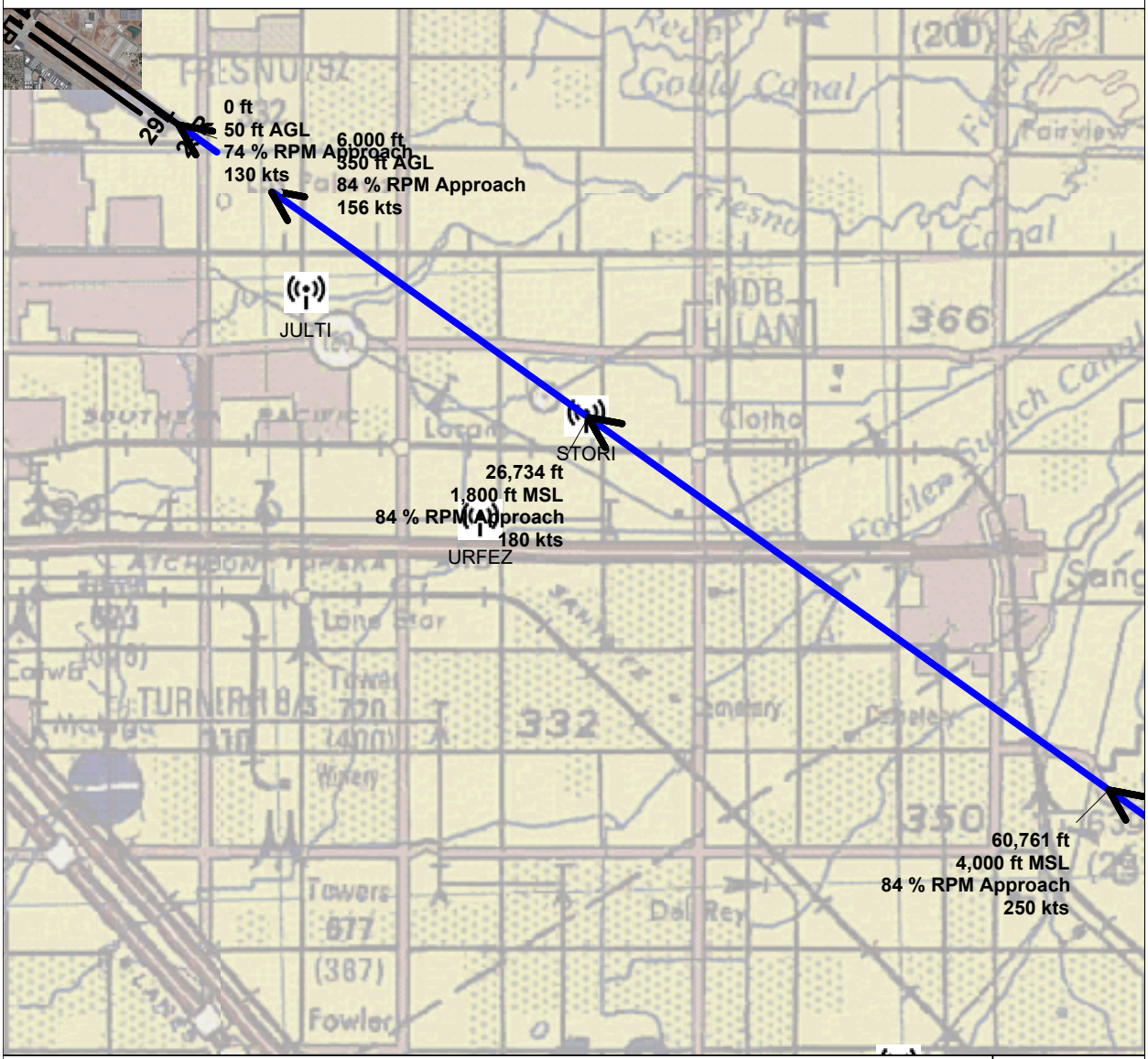
Flight Track: 11LTAC2 - TAC Initial - Wing Aircraft: F-15EX F-15EX Engine: F110-GE-129

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000

Scale in Feet 1:129,000 (1 inch = 10,700 feet)

Flight Profile x15A4

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	150,000	8,000 MSL	82 Takeoff	250	-2.6	-1100	211	
b	60,761	4,000 MSL	84 Approach	250	-3.7	-1400	94	configure, between 2800 and 6000' at SANG
c	26,734	1,800 MSL	84 Approach	180	-3.1	-900	73	STORI
d	6,000	350 AGL	84 Approach	156	-2.9	-700	25	
e	0	50 AGL	74 Approach	130				



Flight Profile x15A4

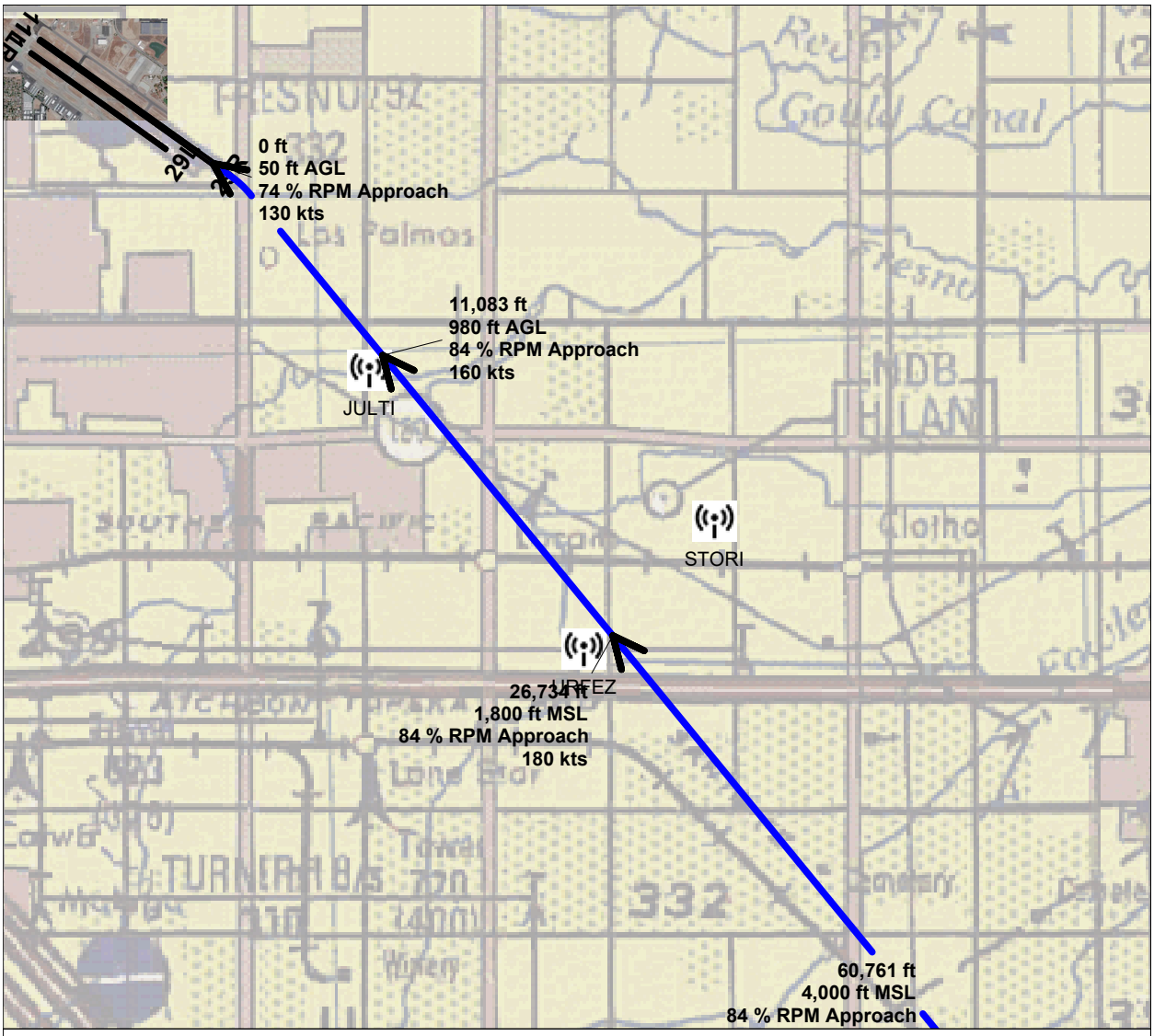
ILS

Flight Track: 29RA1 - STRAIGHT IN Aircraft: F-15EX F-15EX Engine: F110-GE-129

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000

Scale in Feet 1:112,000 (1 inch = 9,340 feet)

N



Flight Profile x15A5

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	150,000	8,000 MSL	82 Takeoff	250	-2.6	-1100	211	
b	60,761	4,000 MSL	84 Approach	250	-3.7	-1400	94	configure, between 2000 and 6000' at IXDEE
c	26,734	1,800 MSL	84 Approach	180	-1.8	-500	55	URFEZ
d	11,083	980 AGL	84 Approach	160	-4.8	-1200	45	
e	0	50 AGL	74 Approach	130				

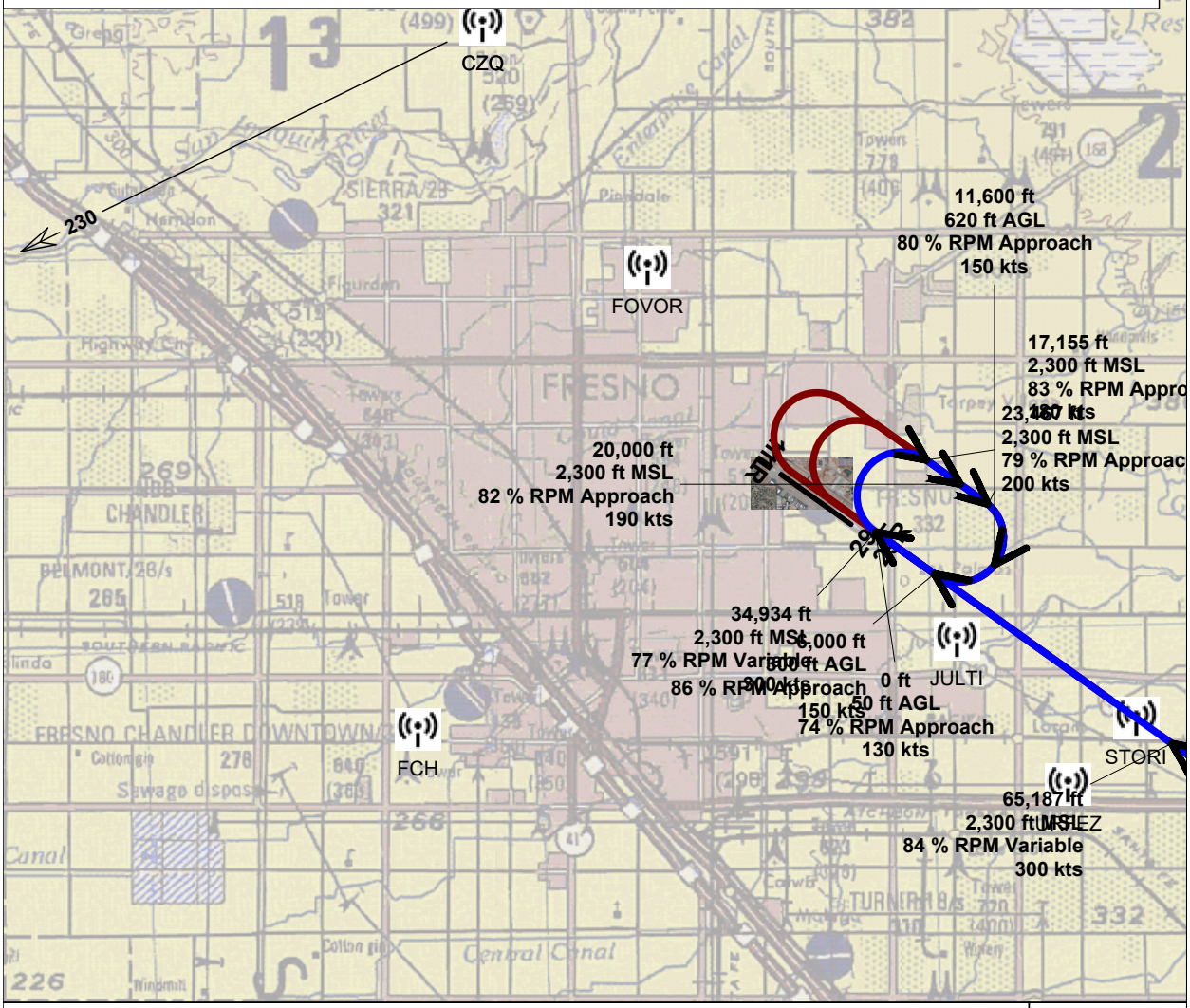
Flight Profile x15A5
TACAN
Flight Track: 29RA3 - ARRIVAL RUNWAY 29R TACAN Aircraft: F-15EX F-15EX
Engine: F110-GE-129

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000

Scale in Feet 1:91,600 (1 inch = 7,630 feet)

Flight Profile x15-9R1

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	74 Variable	300	-3.2	-1700	95	
b	65,187	2,300 MSL	84 Variable	300	0.0	0	60	initial
c	34,934	2,300 MSL	77 Variable	300	0.0	0	27	Break pt
d	23,467	2,300 MSL	79 Approach	200	0.0	0	11	Start downwind, begin to drop gear
e	20,000	2,300 MSL	82 Approach	190	0.0	0	9	End downwind,
f	17,155	2,300 MSL	83 Approach	180	-13.6	-4000	20	End downwind,
g	11,600	620 AGL	80 Approach	150	-3.3	-900	22	1nm final
h	6,000	300 AGL	86 Approach	150	-2.4	-600	25	1nm final
i	0	50 AGL	74 Approach	130				



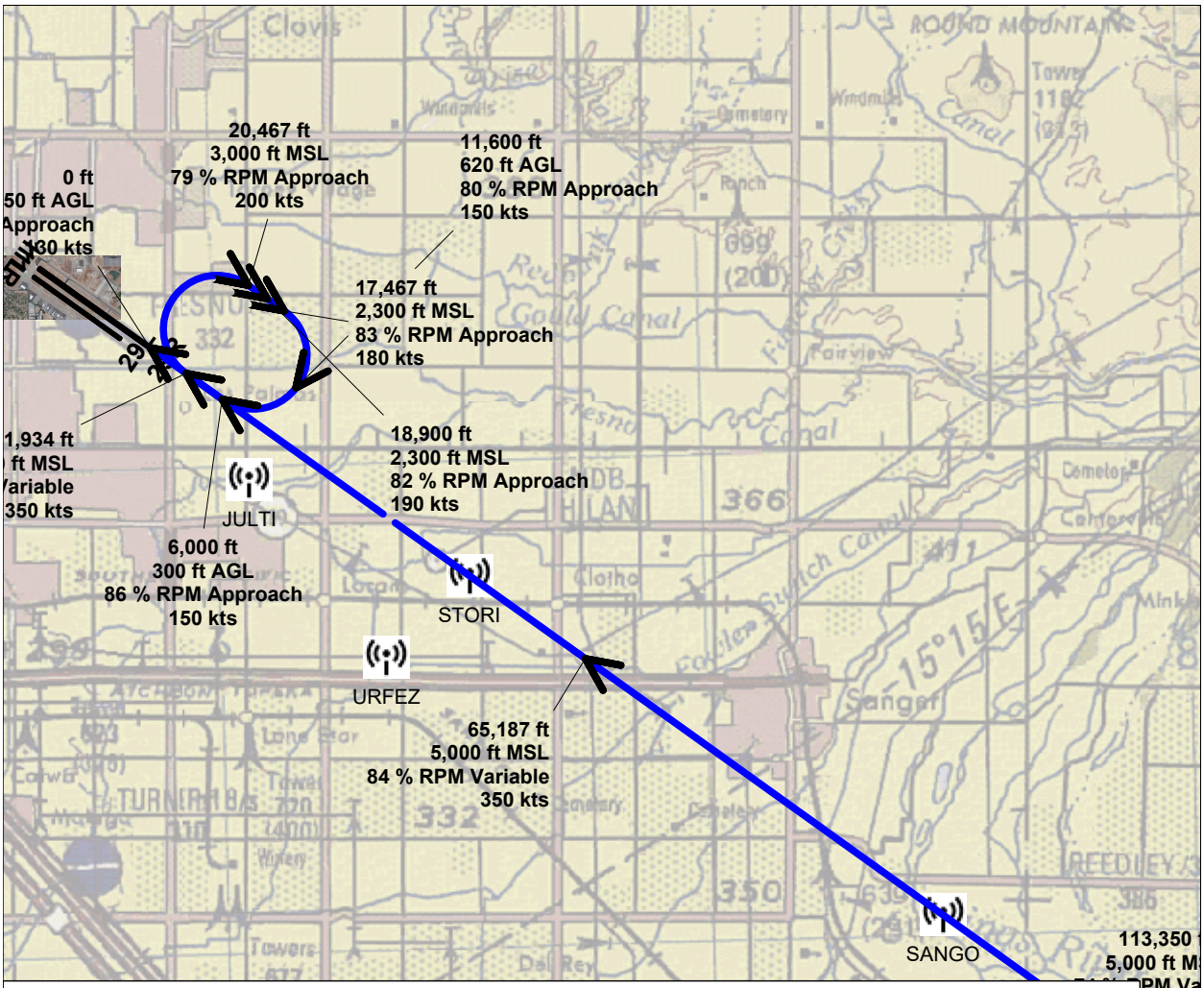
Flight Profile x15-9R1

1st ship break

Flight Track: 29RO1 - Break Aircraft: F-15EX F-15EX Engine: F110-GE-129

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:182,000 (1 inch = 15,100 feet)



Flight Profile x15-9T1

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	74 Variable	350	0.0	0	82	
b	65,187	5,000 MSL	84 Variable	350	0.0	0	56	initial
c	31,934	5,000 MSL	77 Variable	350	-9.9	-4900	25	begin constant descent to perch
d	20,467	3,000 MSL	79 Approach	200	-24.1	-8800	5	begin to drop gear
e	18,900	2,300 MSL	82 Approach	190	0.0	0	5	Perch point
f	17,467	2,300 MSL	83 Approach	180	-12.9	-3800	21	Perch point
g	11,600	620 AGL	80 Approach	150	-3.3	-900	22	1nm final
h	6,000	300 AGL	86 Approach	150	-2.4	-600	25	1nm final
i	0	50 AGL	74 Approach	130				

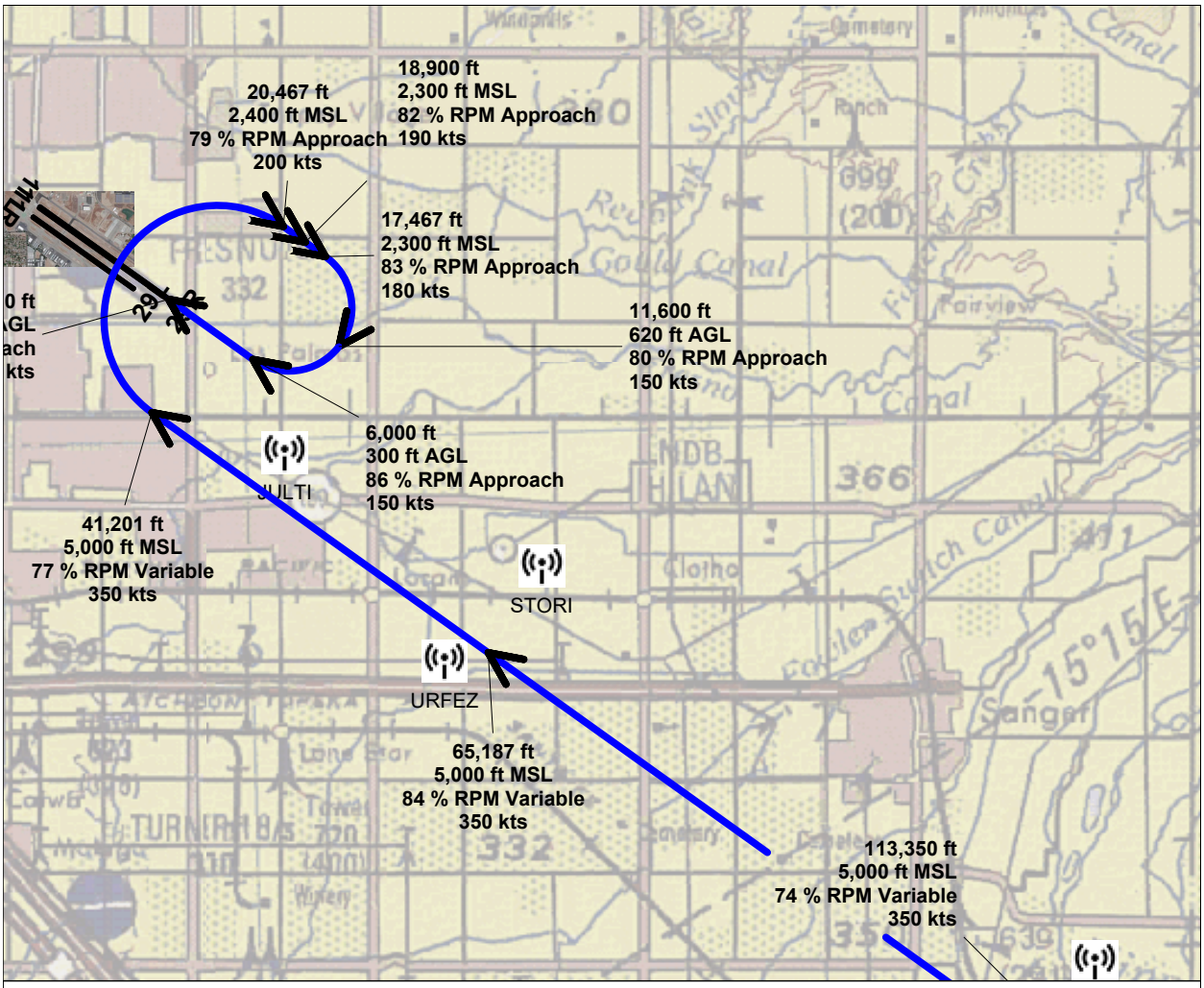
Flight Profile x15-9T1

1st ship

Flight Track: 29RTAC1 - TAC Initial - Lead Aircraft: F-15EX F-15EX Engine: F110-GE-129

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000 52,000

Scale in Feet 1:150,000 (1 inch = 12,500 feet)



Flight Profile x15-9T2

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	74 Variable	350	0.0	0	82	
b	65,187	5,000 MSL	84 Variable	350	0.0	0	41	initial
c	41,201	5,000 MSL	77 Variable	350	-7.1	-3500	45	begin constant descent to perch
d	20,467	2,400 MSL	79 Approach	200	-3.7	-1300	5	begin to drop gear, level off for downwind
e	18,900	2,300 MSL	82 Approach	190	0.0	0	5	Perch point
f	17,467	2,300 MSL	83 Approach	180	-12.9	-3800	21	Perch point
g	11,600	620 AGL	80 Approach	150	-3.3	-900	22	1nm final
h	6,000	300 AGL	86 Approach	150	-2.4	-600	25	1nm final
i	0	50 AGL	74 Approach	130				

Flight Profile x15-9T2

Wing

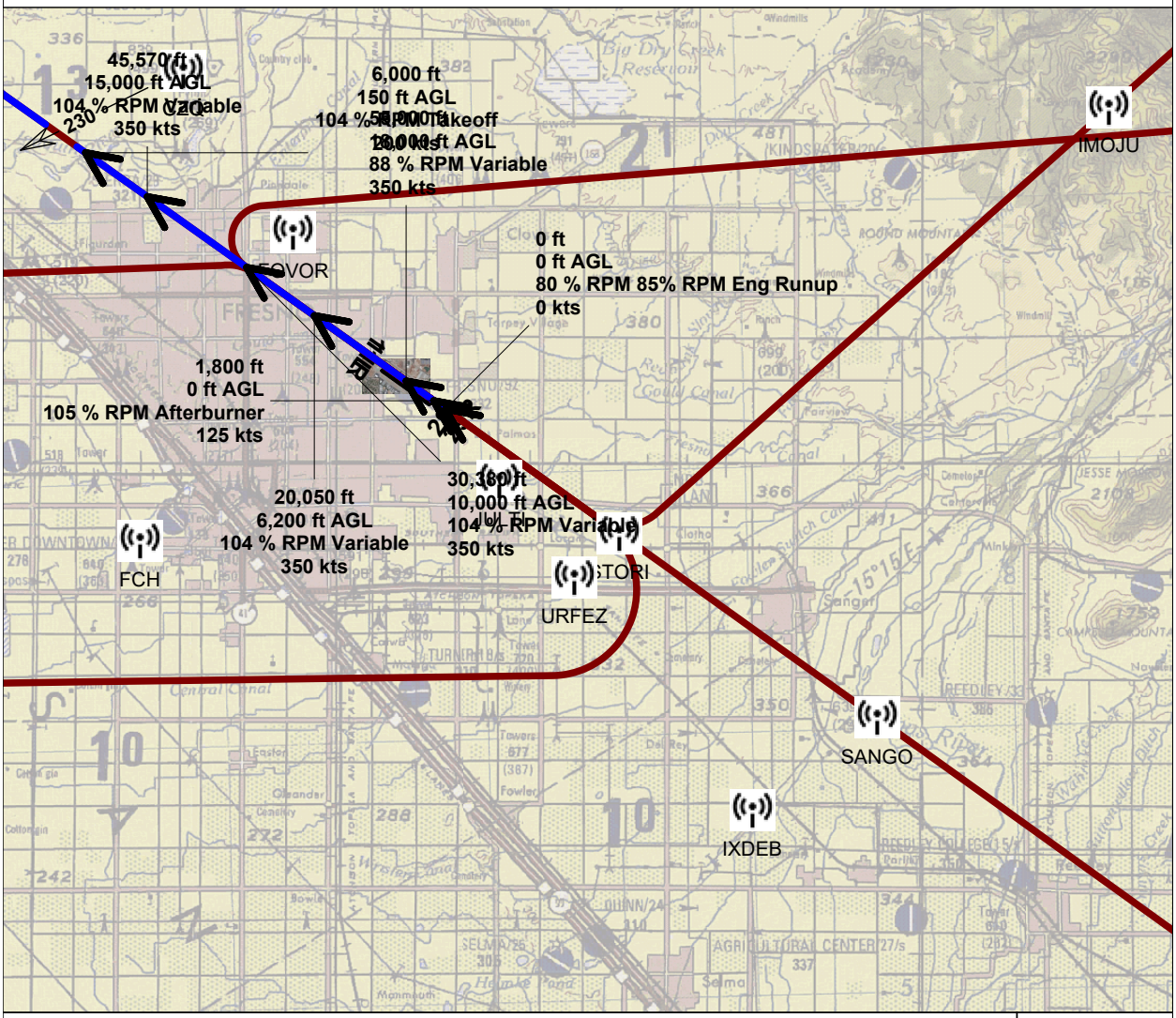
Flight Track: 29RTAC2 - TAC Initial - Wing Aircraft: F-15EX F-15EX Engine: F110-GE-129

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000

Scale in Feet 1:128,000 (1 inch = 10,700 feet)

Flight Profile x15-D10A

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	N
a	0	0 AGL	80 85% RPM Eng Runup	0	0.0	0	17	noisefile has a "85% Eng Runu
b	1,800	0 AGL	105 Afterburner	125	2.0	600	15	1800' to reach 125 start rotate
c	6,000	150 AGL	104 Takeoff	200	23.3	12000	30	into MIL, cleaning gear
d	20,050	6,200 AGL	104 Variable	350	20.2	13000	17	
e	30,380	10,000 AGL	104 Variable	350	18.2	11700	26	
f	45,570	15,000 AGL	104 Variable	350	17.6	11300	16	
g	55,000	18,000 AGL	88 Variable	350	0.0	0	110	assume level at 18k
h	120,000	18,000 AGL	88 Variable	350				



Flight Profile x15-D10A

AB Departure cleared to climb

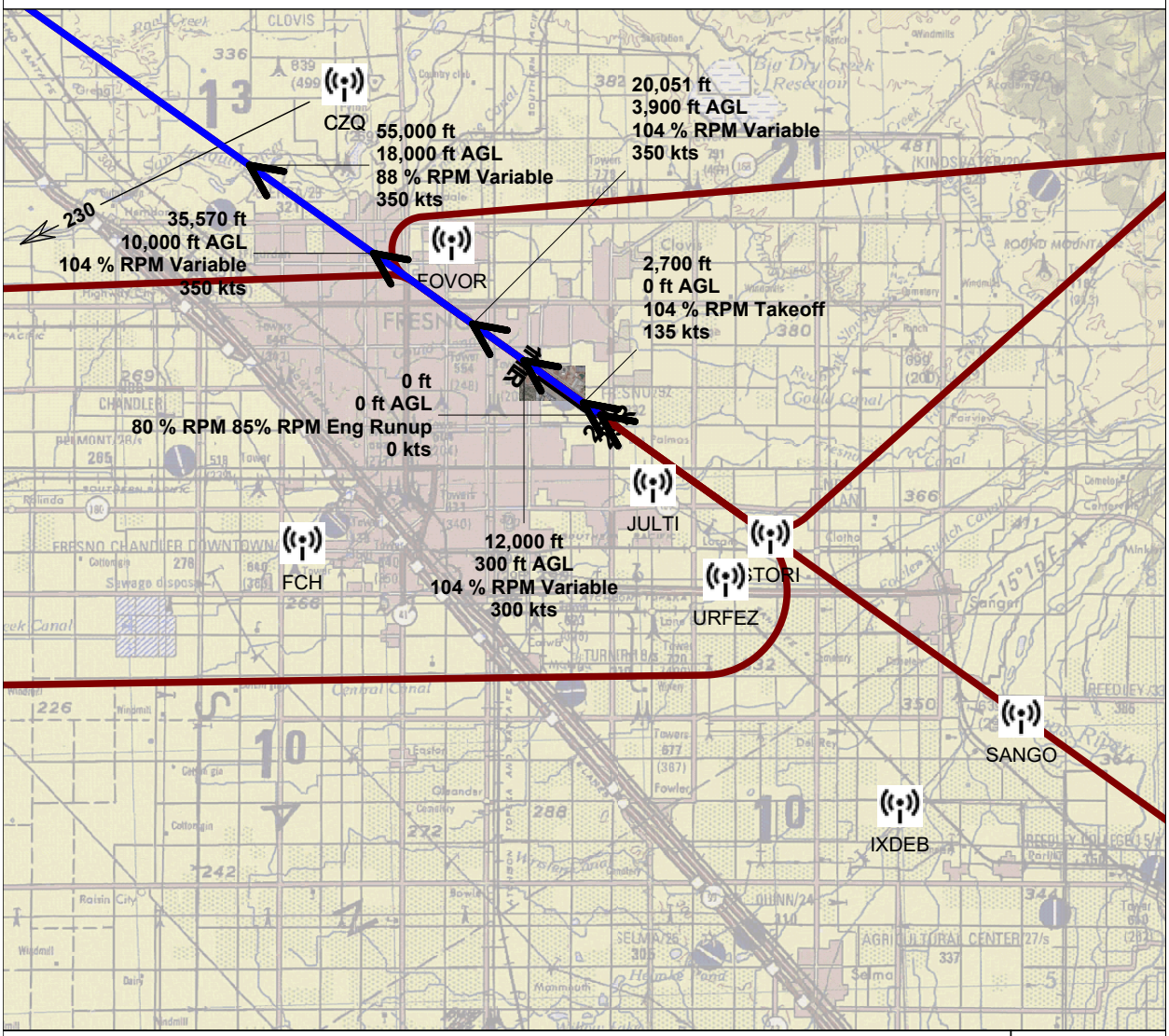
Flight Track: 29RD1 Aircraft: F-15EX F-15EX Engine: F110-GE-129

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000

Scale in Feet 1:269,000 (1 inch = 22,400 feet)

Flight Profile x15-D10M

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	N
a	0	0 AGL	80 85% RPM Eng Runup	0	0.0	0	24	noisefile has a "85% Eng Runu
b	2,700	0 AGL	104 Takeoff	135	1.8	700	25	2700' to reach 135
c	12,000	300 AGL	104 Variable	300	24.1	14700	15	
d	20,051	3,900 AGL	104 Variable	350	21.5	13900	26	3.9kft at 3.3nm
e	35,570	10,000 AGL	104 Variable	350	22.4	14600	33	10k at 5.8nm
f	55,000	18,000 AGL	88 Variable	350	0.0	0	110	assume level at 18k
g	120,000	18,000 AGL	88 Variable	350				



Flight Profile x15-D10M

Mil Departure cleared to climb

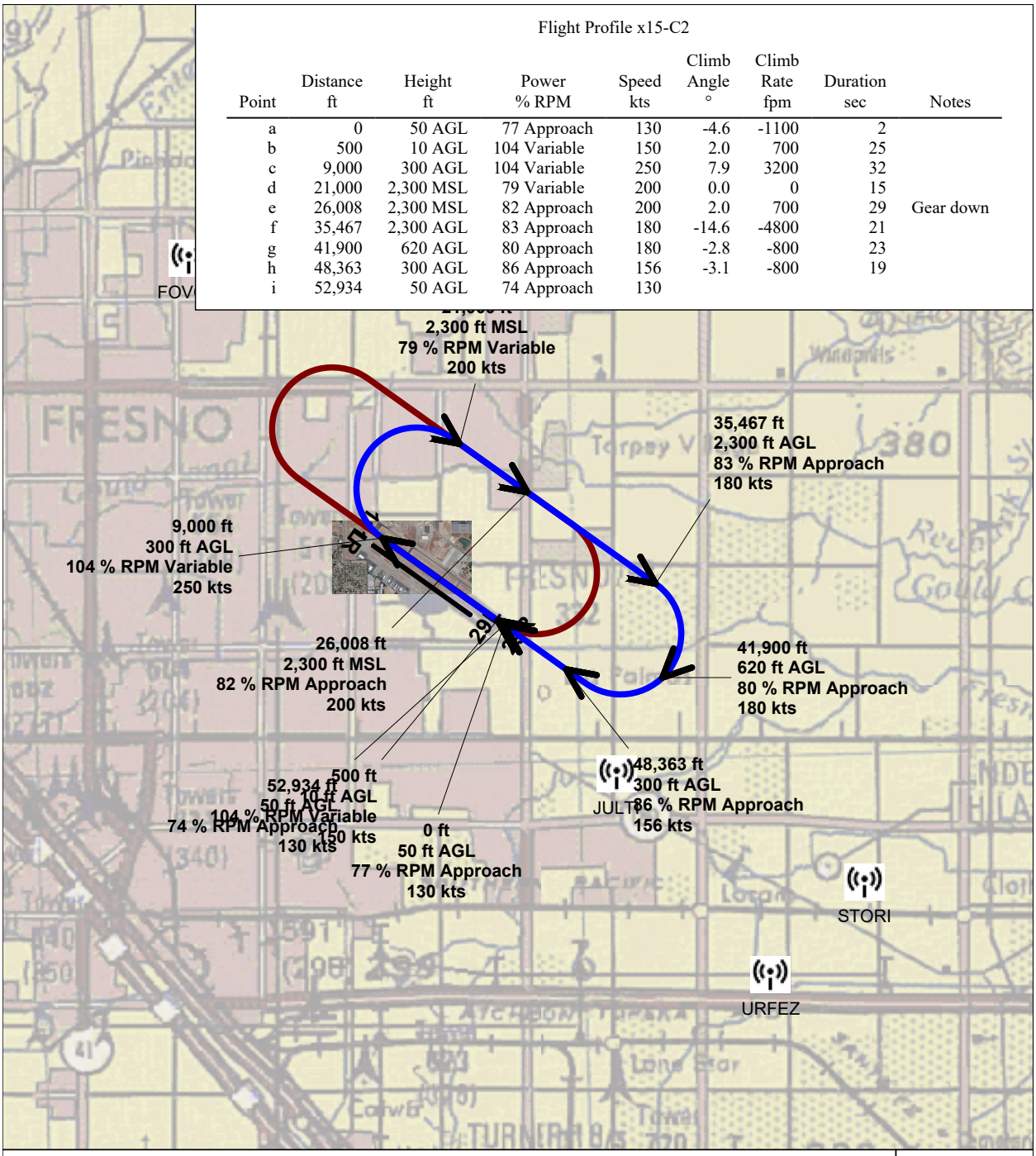
Flight Track: 29RD1 Aircraft: F-15EX F-15EX Engine: F110-GE-129

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000

Scale in Feet 1:274,000 (1 inch = 22,800 feet)

Flight Profile x15-C2

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	0	50 AGL	77 Approach	130	-4.6	-1100	2	
b	500	10 AGL	104 Variable	150	2.0	700	25	
c	9,000	300 AGL	104 Variable	250	7.9	3200	32	
d	21,000	2,300 MSL	79 Variable	200	0.0	0	15	
e	26,008	2,300 MSL	82 Approach	200	2.0	700	29	Gear down
f	35,467	2,300 AGL	83 Approach	180	-14.6	-4800	21	
g	41,900	620 AGL	80 Approach	180	-2.8	-800	23	
h	48,363	300 AGL	86 Approach	156	-3.1	-800	19	
i	52,934	50 AGL	74 Approach	130				



Flight Profile x15-C2
closed pattern
Flight Track: 29RCP1 - LOW APPROACH RUNWAY 29R TRACK 1 Aircraft: F-15EX
F-15EX Engine: F110-GE-129

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000

Scale in Feet 1:114,000 (1 inch = 9,530 feet)

F-35A Flight Profile Maps

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Flight Profile F35A1

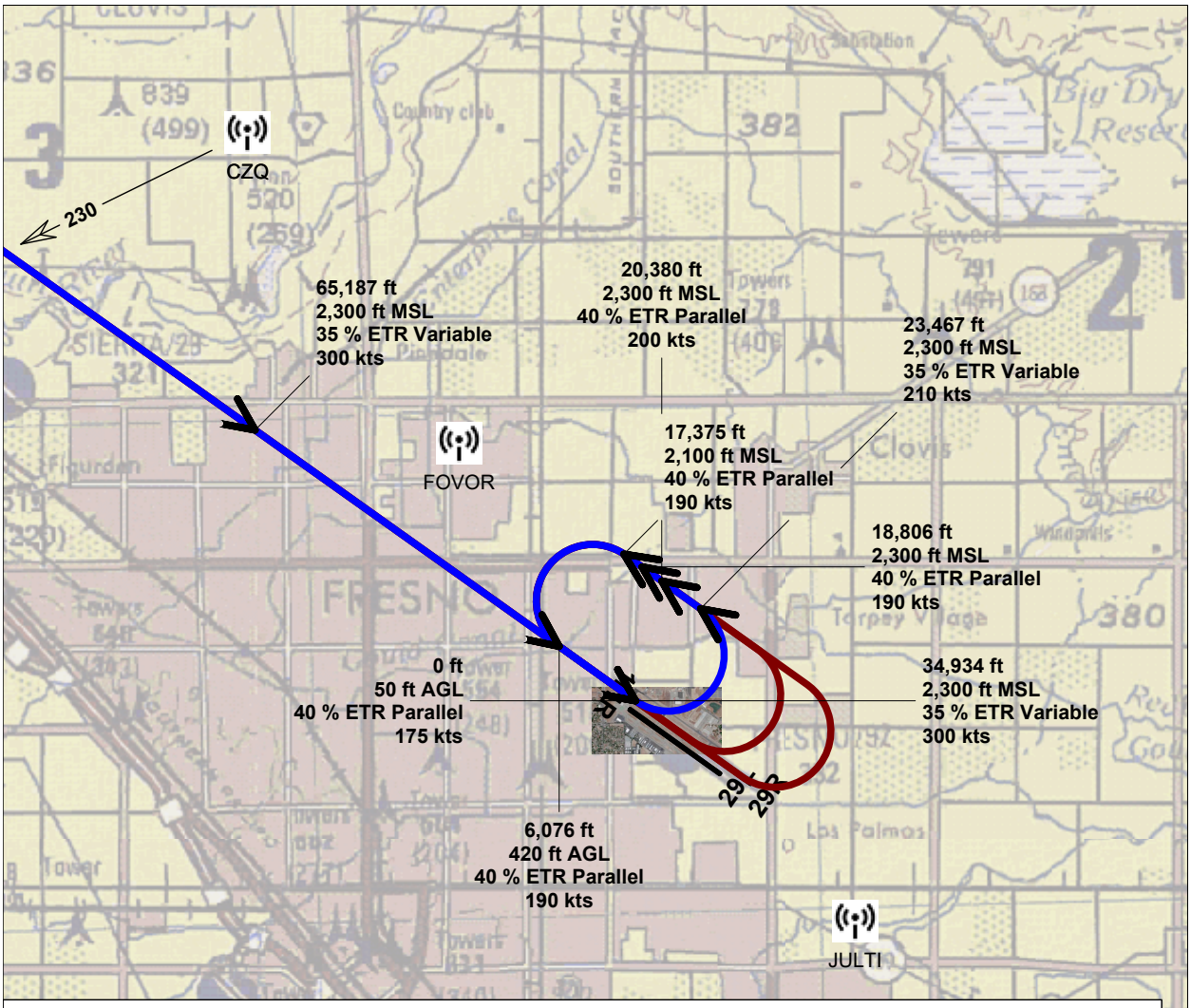
Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	150,000	8,000 MSL	15 Variable	250	-2.6	-1100	223	
b	60,761	4,000 MSL	40 Parallel	225	-4.5	-1800	43	
c	44,259	2,700 MSL	40 Parallel	225	-2.2	-800	72	CZQ
d	19,541	1,420 AGL	40 Parallel	180	-4.0	-1300	65	FOVOR
e	0	50 AGL	40 Parallel	175				Assume cross threashold at 50 ft AGL

Flight Profile F35A1
TACAN
Flight Track: 11LA2 - TACAN rwy 11L Aircraft: F-35A F-35A Engine: F-135-PW-100

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000

Scale in Feet 1:95,300 (1 inch = 7,940 feet)

N



Flight Profile F35-1L1

Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	15 Variable	300	-3.2	-1700	95	
b	65,187	2,300 MSL	35 Variable	300	0.0	0	60	Initial Point;
c	34,934	2,300 MSL	35 Variable	300	0.0	0	27	begin break
d	23,467	2,300 MSL	35 Variable	210	0.0	0	9	wings level, begin downwind
e	20,380	2,300 MSL	40 Parallel	200	0.0	0	5	gear down; increase power
f	18,806	2,300 MSL	40 Parallel	190	-8.0	-2700	4	begin descent
g	17,375	2,100 MSL	40 Parallel	190	-6.8	-2300	35	end downwind
h	6,076	420 AGL	40 Parallel	190	-3.5	-1100	20	wings level, begin 1 nm final
i	0	50 AGL	40 Parallel	175				Assume cross threshold at 50 ft AGL

Flight Profile F35-1L1

1st ship break

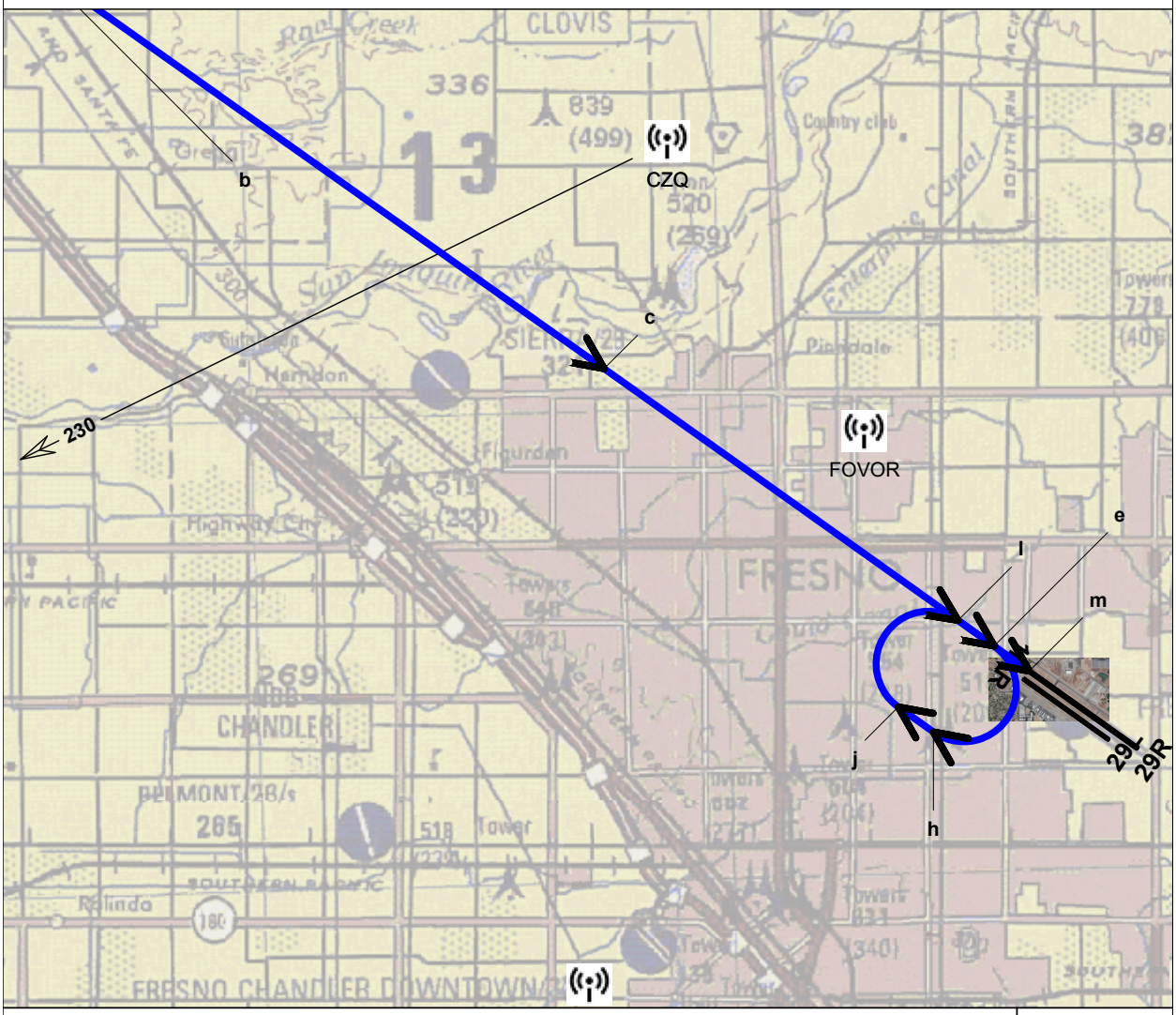
Flight Track: 11LO1 - Break Aircraft: F-35A F-35A Engine: F-135-PW-100

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000

Scale in Feet 1:142,000 (1 inch = 11,800 feet)

Flight Profile F35-1T1

Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	15 Variable	300	0.0	0	95	
b	65,187	5,000 MSL	35 Variable	300	0.0	0	66	Initial Point;
c	31,934	5,000 MSL	35 Variable	300	-9.9	-4400	27	begin begin constant descent to perch point
d	20,467	3,000 MSL	40 Parallel	200	-13.1	-4600	9	gear down; increase power
e	17,467	2,300 MSL	40 Parallel	190	-8.3	-2800	36	end downwind
f	6,076	300 AGL	40 Parallel	190	-2.4	-800	20	wings level, begin 1 nm final
g	0	50 AGL	40 Parallel	175				Assume cross threshold at 50 ft AGL



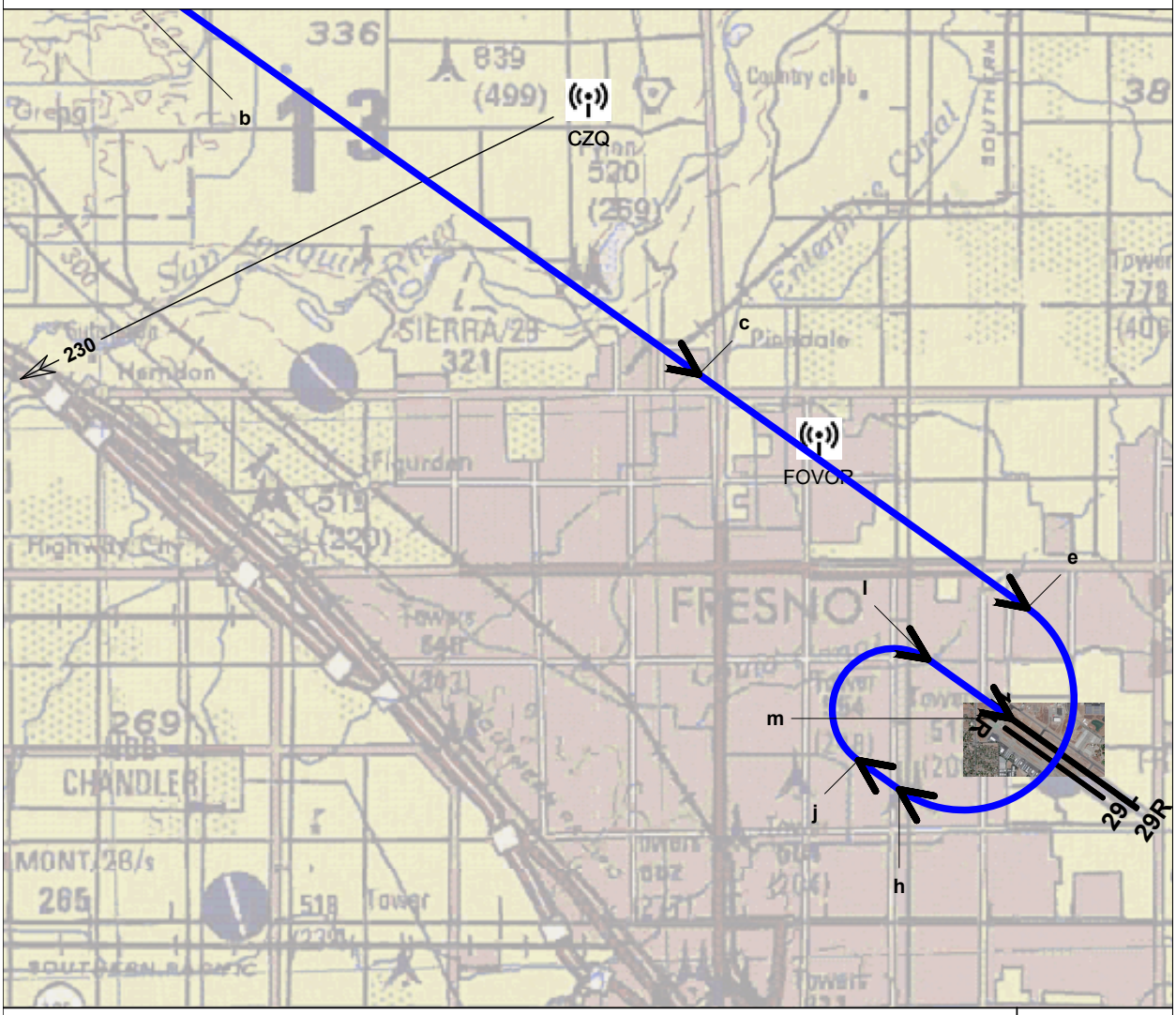
Flight Profile F35-1T1
1st ship
Flight Track: 11LTAC1 - TAC Initial - Lead Aircraft: F-35A F-35A Engine: F-135-PW-100

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000 52,000

Scale in Feet 1:150,000 (1 inch = 12,500 feet)

Flight Profile F35-1T2

Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	15 Variable	300	0.0	0	95	
b	65,187	5,000 MSL	35 Variable	300	0.0	0	47	Initial Point;
c	41,201	5,000 MSL	35 Variable	300	-7.1	-3200	49	begin begin constant descent to perch point
d	20,467	2,400 MSL	40 Parallel	200	-1.9	-700	9	gear down; increase power
e	17,467	2,300 MSL	40 Parallel	190	-8.3	-2800	36	end downwind
f	6,076	300 AGL	40 Parallel	190	-2.4	-800	20	wings level, begin 1 nm final
g	0	50 AGL	40 Parallel	175				Assume cross threshold at 50 ft AGL



Flight Profile F35-1T2
Wing
Flight Track: 11LTAC2 - TAC Initial - Wing Aircraft: F-35A F-35A Engine: F-135-PW-100

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000

Scale in Feet 1:129,000 (1 inch = 10,700 feet)

Flight Profile F35A4

Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	150,000	8,000 MSL	15 Variable	250	-2.6	-1100	223	
b	60,761	4,000 MSL	40 Parallel	225	-3.7	-1500	90	
c	26,734	1,800 MSL	40 Parallel	225	-3.1	-1100	61	CZQ
d	6,000	350 AGL	40 Parallel	180	-2.9	-900	20	FOVOR
e	0	50 AGL	40 Parallel	175				Assume cross threashold at 50 ft AGL

Flight Profile F35A4

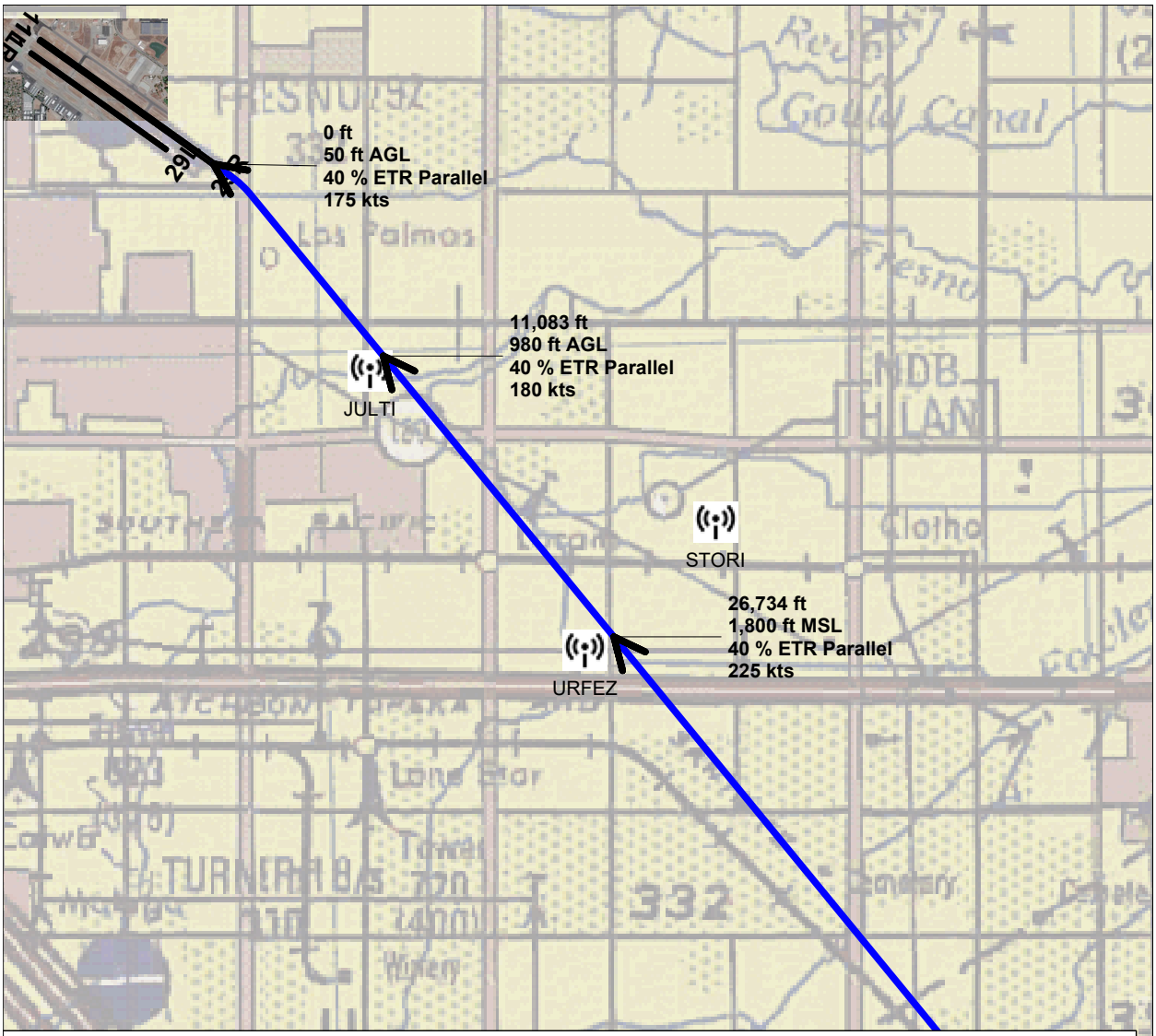
ILS

Flight Track: 29RA1 - STRAIGHT IN Aircraft: F-35A F-35A Engine: F-135-PW-100

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000

Scale in Feet 1:112,000 (1 inch = 9,340 feet)

N



Flight Profile F35A5

Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	150,000	8,000 MSL	15 Variable	250	-2.6	-1100	223	
b	60,761	4,000 MSL	40 Parallel	225	-3.7	-1500	90	
c	26,734	1,800 MSL	40 Parallel	225	-1.8	-600	46	CZQ
d	11,083	980 AGL	40 Parallel	180	-4.8	-1500	37	FOVOR
e	0	50 AGL	40 Parallel	175				Assume cross threashold at 50 ft AGL

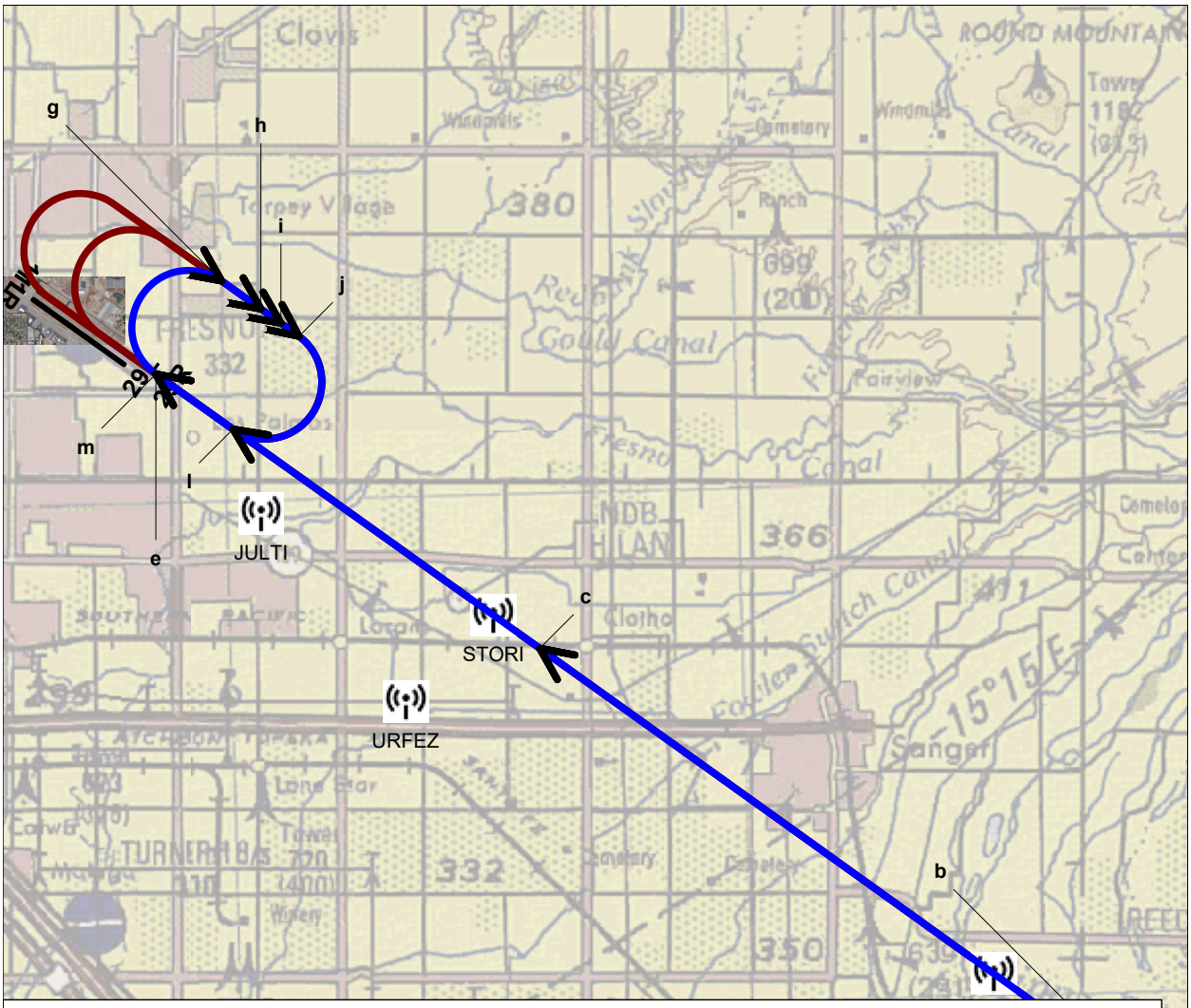
Flight Profile F35A5

TACAN

Flight Track: 29RA3 - ARRIVAL RUNWAY 29R TACAN Aircraft: F-35A F-35A Engine: F-135-PW-100

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000

Scale in Feet 1:91,600 (1 inch = 7,630 feet)



Flight Profile F35-9R1

Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	15 Variable	300	-3.2	-1700	95	
b	65,187	2,300 MSL	35 Variable	300	0.0	0	60	Initial Point;
c	34,934	2,300 MSL	35 Variable	300	0.0	0	27	begin break
d	23,467	2,300 MSL	35 Variable	210	0.0	0	9	wings level, begin downwind
e	20,380	2,300 MSL	40 Parallel	200	0.0	0	5	gear down; increase power
f	18,806	2,300 MSL	40 Parallel	190	-8.0	-2700	4	begin descent
g	17,375	2,100 MSL	40 Parallel	190	-6.8	-2300	35	end downwind
h	6,076	420 AGL	40 Parallel	190	-3.5	-1100	20	wings level, begin 1 nm final
i	0	50 AGL	40 Parallel	175				Assume cross threshold at 50 ft AGL

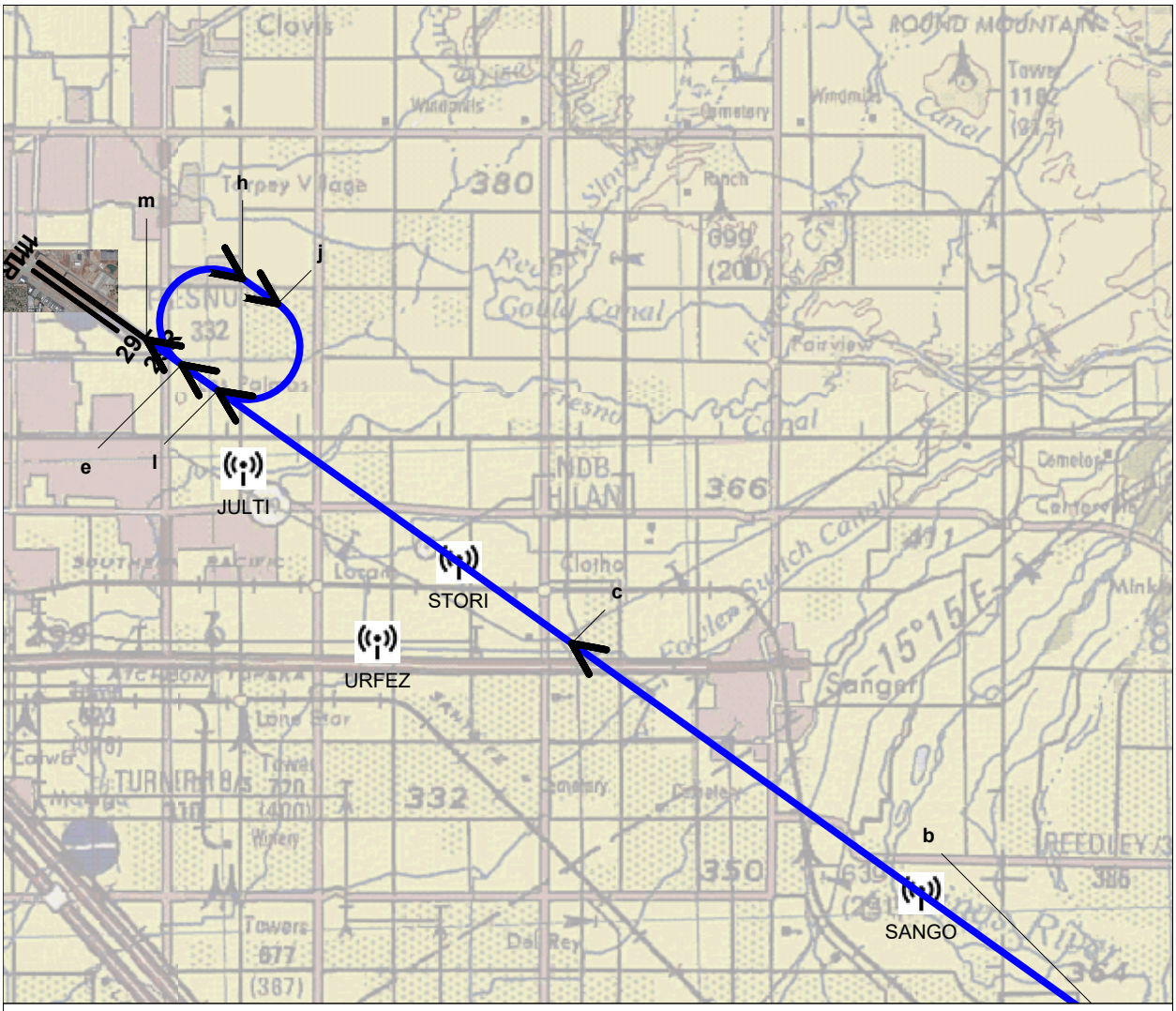
Flight Profile F35-9R1

1st ship break

Flight Track: 29RO1 - Break Aircraft: F-35A F-35A Engine: F-135-PW-100

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000

Scale in Feet 1:140,000 (1 inch = 11,700 feet)



Flight Profile F35-9T1

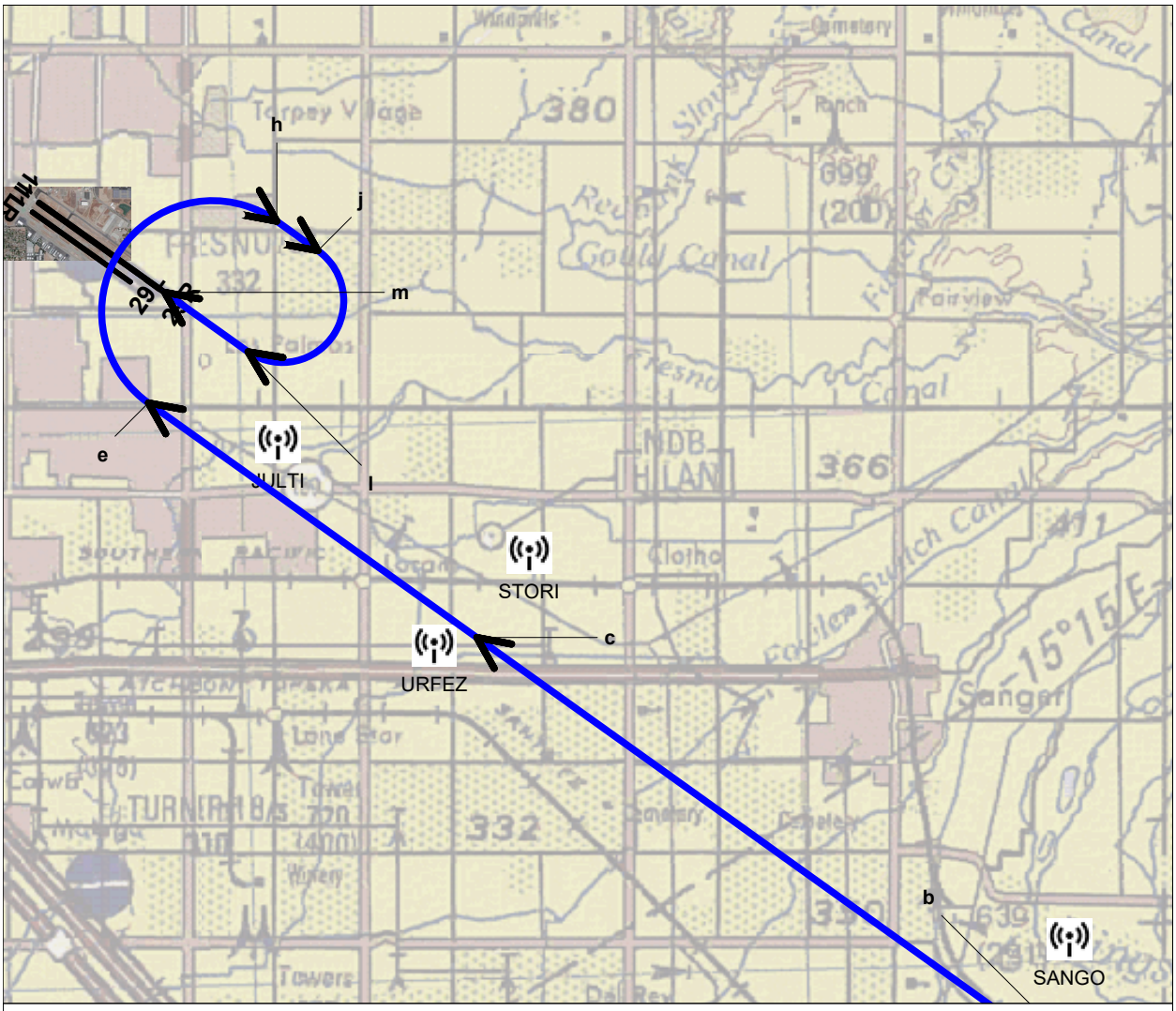
Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	15 Variable	300	0.0	0	95	
b	65,187	5,000 MSL	35 Variable	300	0.0	0	66	Initial Point;
c	31,934	5,000 MSL	35 Variable	300	-9.9	-4400	27	begin begin constant descent to perch point
d	20,467	3,000 MSL	40 Parallel	200	-13.1	-4600	9	gear down; increase power
e	17,467	2,300 MSL	40 Parallel	190	-8.3	-2800	36	end downwind
f	6,076	300 AGL	40 Parallel	190	-2.4	-800	20	wings level, begin 1 nm final
g	0	50 AGL	40 Parallel	175				Assume cross threshold at 50 ft AGL

Flight Profile F35-9T1
1st ship
Flight Track: 29RTAC1 - TAC Initial - Lead Aircraft: F-35A F-35A Engine: F-135-PW-100

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000 52,000

Scale in Feet 1:150,000 (1 inch = 12,500 feet)

N



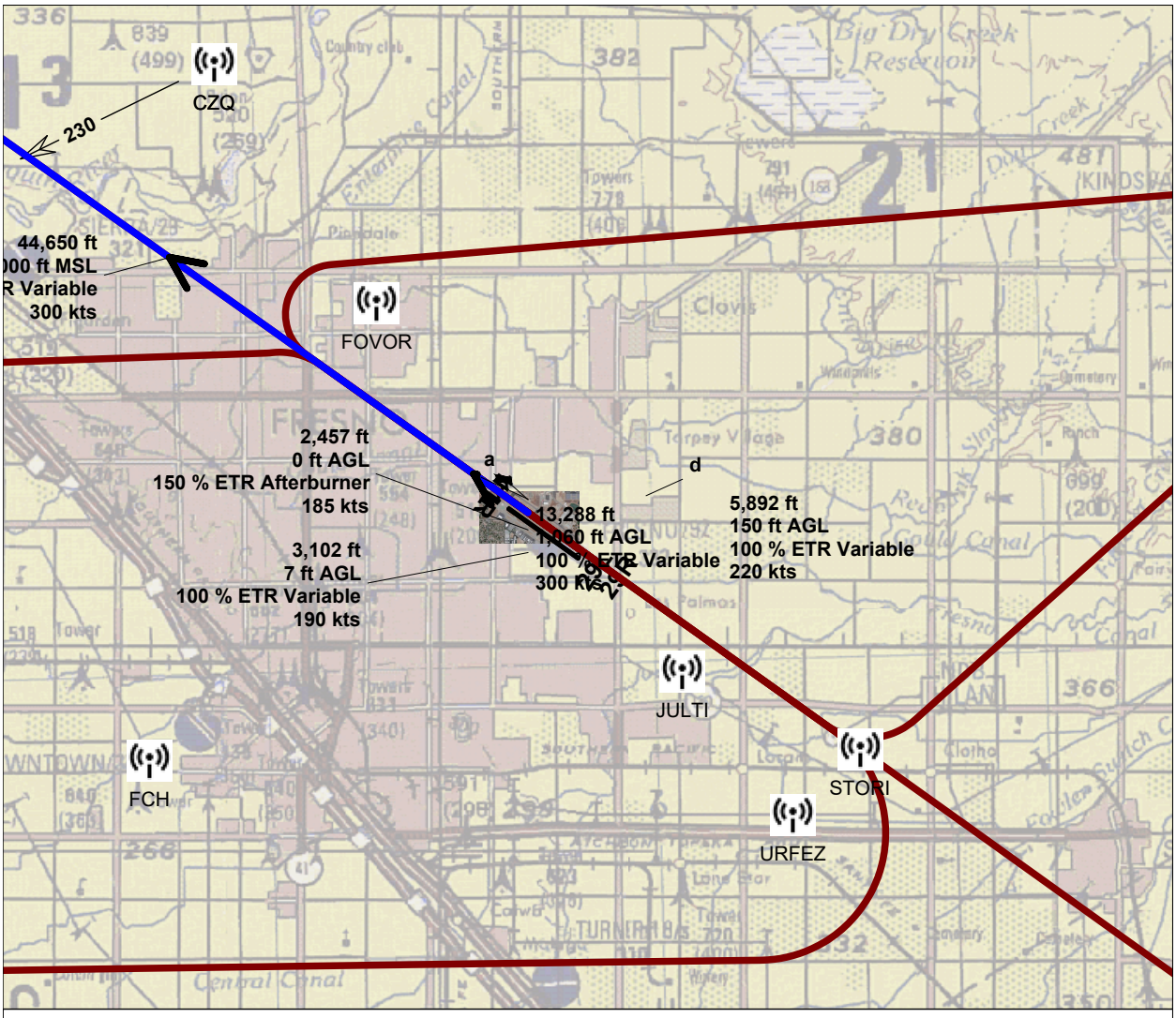
Flight Profile F35-9T2

Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	113,350	5,000 MSL	15 Variable	300	0.0	0	95	
b	65,187	5,000 MSL	35 Variable	300	0.0	0	47	Initial Point;
c	41,201	5,000 MSL	35 Variable	300	-7.1	-3200	49	begin begin constant descent to perch point
d	20,467	2,400 MSL	40 Parallel	200	-1.9	-700	9	gear down; increase power
e	17,467	2,300 MSL	40 Parallel	190	-8.3	-2800	36	end downwind
f	6,076	300 AGL	40 Parallel	190	-2.4	-800	20	wings level, begin 1 nm final
g	0	50 AGL	40 Parallel	175				Assume cross threshold at 50 ft AGL

Flight Profile F35-9T2
Wing
Flight Track: 29RTAC2 - TAC Initial - Wing Aircraft: F-35A F-35A Engine: F-135-PW-100

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000

Scale in Feet 1:128,000 (1 inch = 10,700 feet)



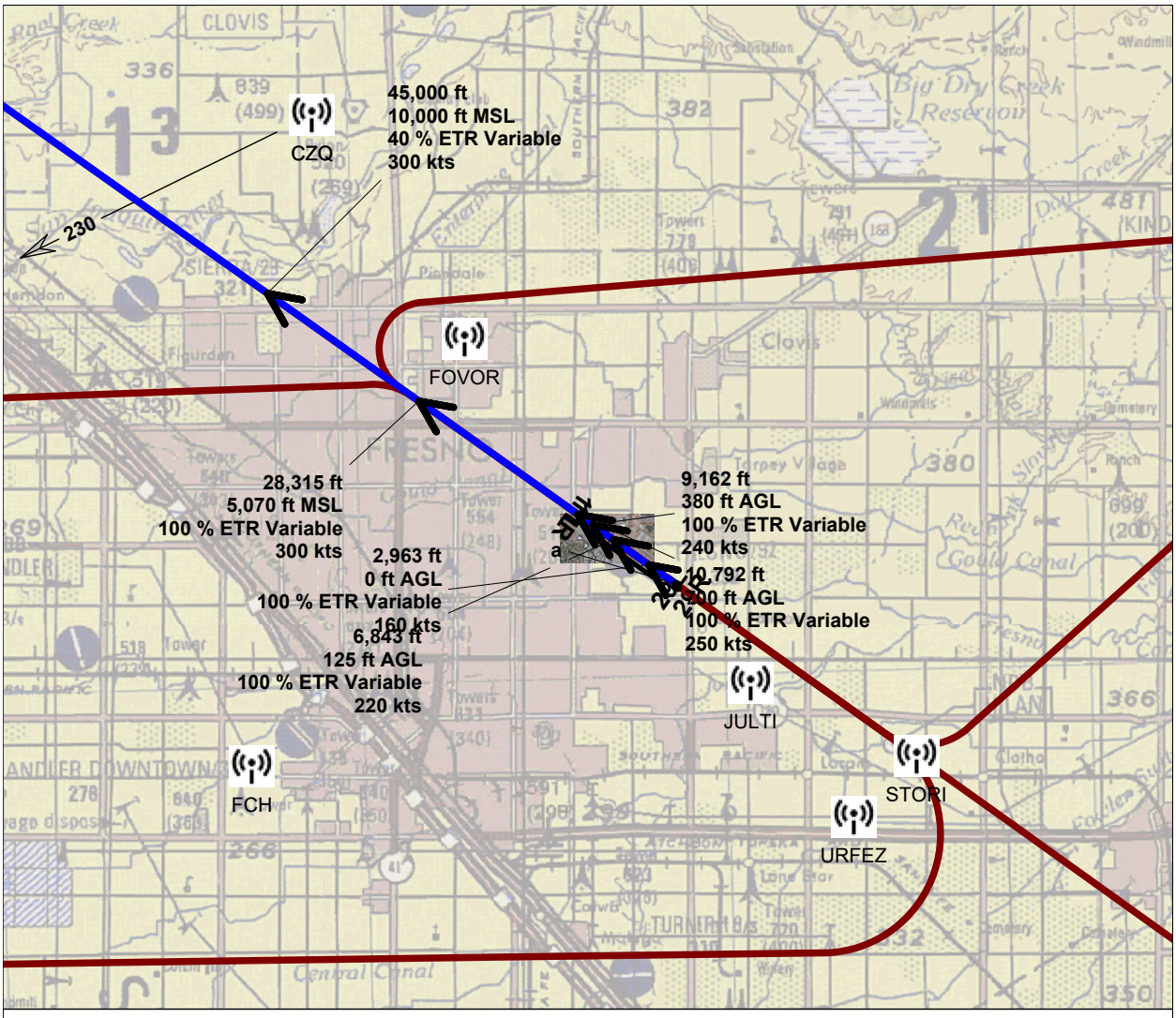
Flight Profile F35-D10A

Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	
a	0	0 AGL	50 Variable	0	0.0	0	16	Assume 1 second @ 50%ETR before bra
b	2,457	0 AGL	150 Afterburner	185	0.6	200	2	Rotate
c	3,102	7 AGL	100 Variable	190	1.8	600	4	Mil power
d	4,454	50 AGL	100 Variable	205	4.0	1500	4	
e	5,892	150 AGL	100 Variable	220	7.0	3200	17	Gear up
f	13,288	1,060 AGL	100 Variable	300	15.3	8300	62	
g	44,650	10,000 MSL	40 Variable	300	0.0	0	307	Assumes continuous climb to 10,000 ft M
h	200,000	10,000 MSL	40 Variable	300				

Flight Profile F35-D10A
AB dep cleared to climb
Flight Track: 29RD1 Aircraft: F-35A F-35A Engine: F-135-PW-100

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:182,000 (1 inch = 15,100 feet)



Flight Profile F35-D10M

Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	N
a	0	0 AGL	50 Variable	0	0.0	0	22	Assume 1 second @ 50% ETR before brake
b	2,963	0 AGL	100 Variable	160	1.8	600	12	Rotate
c	6,843	125 AGL	100 Variable	220	6.3	2600	6	Gear up
d	9,162	380 AGL	100 Variable	240	11.1	4900	4	Speed slope change
e	10,792	700 AGL	100 Variable	250	13.0	6400	38	approx 7k fpm climb
f	28,315	5,070 MSL	100 Variable	300	16.5	9000	33	Begin approx 9k fpm climb at 300 KIAS bel
g	45,000	10,000 MSL	40 Variable	300	0.0	0	306	Assumes continuous climb to 10,000 ft MSL
h	200,000	10,000 MSL	40 Variable	300				

Flight Profile F35-D10M

Mil dep cleared to climb

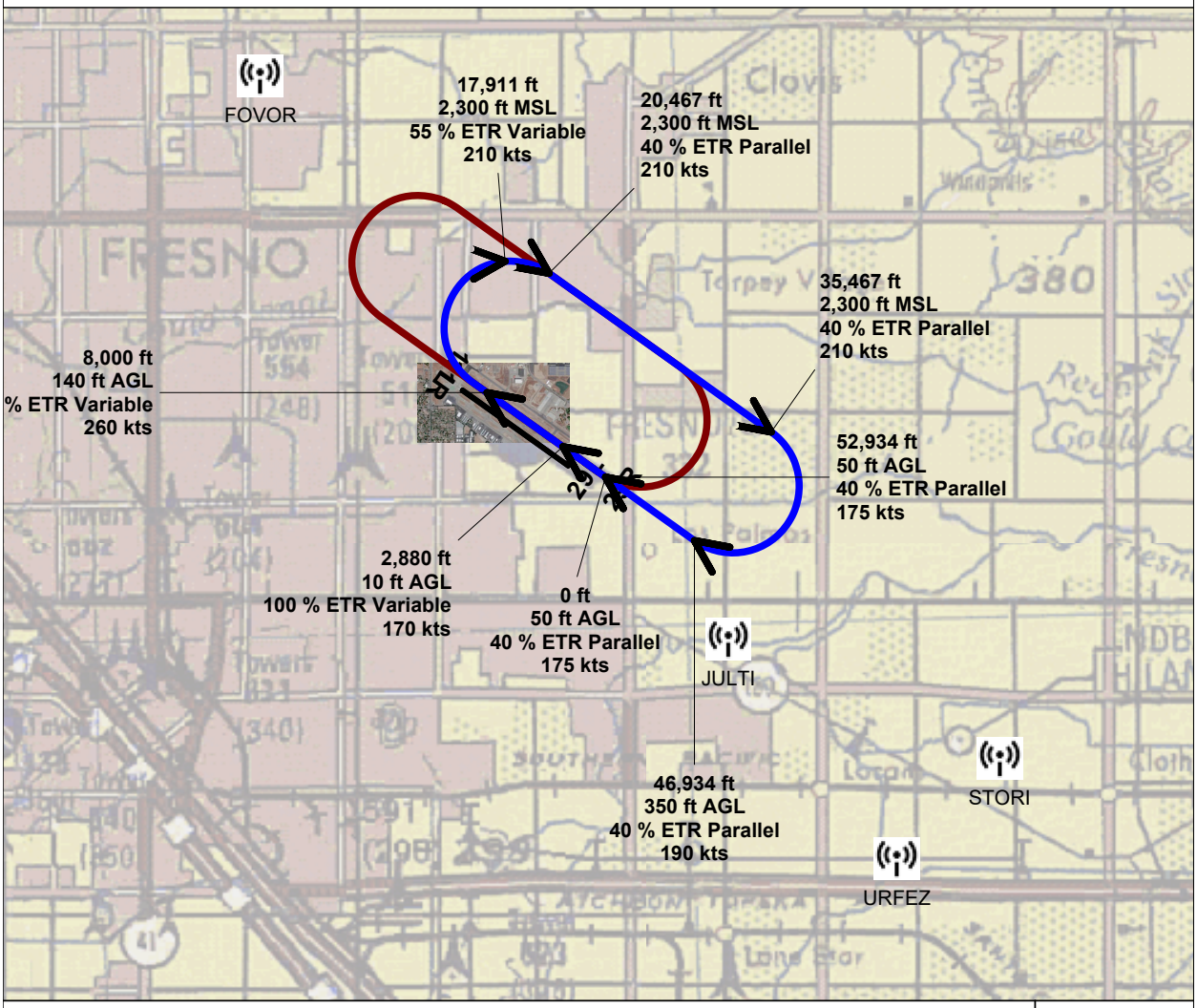
Flight Track: 29RD1 Aircraft: F-35A F-35A Engine: F-135-PW-100

0 10,000 20,000 30,000 40,000 50,000 60,000

Scale in Feet 1:194,000 (1 inch = 16,200 feet)

Flight Profile F35-C2

Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	0	50 AGL	40 Parallel	175	-0.8	-200	10	Assume cross threshold at 50 ft AGL
b	2,880	10 AGL	100 Variable	170	1.5	600	14	low approach; no touch; use Variable due to li
c	8,000	140 AGL	55 Variable	260	10.4	4400	25	gear up; reduce power
d	17,911	2,300 MSL	55 Variable	210	0.0	0	7	reach pattern altitude and speed
e	20,467	2,300 MSL	40 Parallel	210	0.0	0	42	gear down
f	35,467	2,300 MSL	40 Parallel	210	-8.0	-2900	34	begin descent
g	46,934	350 AGL	40 Parallel	190	-2.9	-900	19	wings level; 1nm final
h	52,934	50 AGL	40 Parallel	175				Assume cross threshold at 50 ft AGL



Flight Profile F35-C2
touch and go
Flight Track: 29RCP1 - LOW APPROACH RUNWAY 29R TRACK 1 Aircraft: F-35A
F-35A Engine: F-135-PW-100

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

Scale in Feet 1:121,000 (1 inch = 10,100 feet)

C-26 Flight Profile Maps

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Flight Profile C26A1

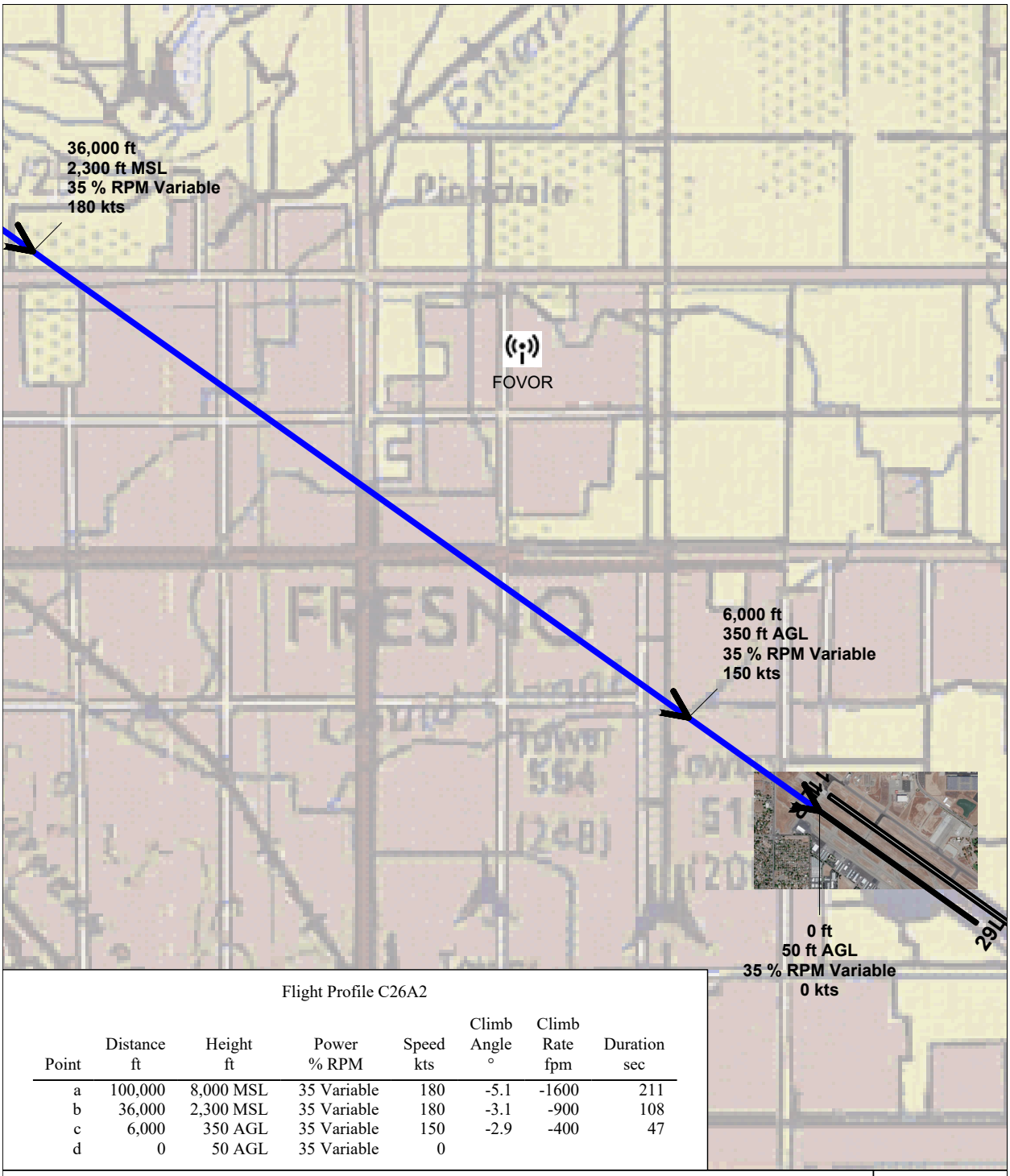
Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	100,000	8,000 MSL	35 Variable	180	-5.1	-1600	211
b	36,000	2,300 MSL	35 Variable	180	-3.1	-900	108
c	6,000	350 AGL	35 Variable	150	-2.9	-400	47
d	0	50 AGL	35 Variable	0			

Flight Profile C26A1

Flight Track: 11LA1 - STRAIGHT IN, Aircraft: Other C-26 (modeled as: BAE-HS-748)

0 4,000 8,000 12,000 16,000 20,000

Scale in Feet 1:72,500 (1 inch = 6,040 feet)



Flight Profile C26A2

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	100,000	8,000 MSL	35 Variable	180	-5.1	-1600	211
b	36,000	2,300 MSL	35 Variable	180	-3.1	-900	108
c	6,000	350 AGL	35 Variable	150	-2.9	-400	47
d	0	50 AGL	35 Variable	0			

Flight Profile C26A2

Flight Track: 11RA1 - STRAIGHT IN, Aircraft: Other C-26 (modeled as: BAE-HS-748)

0 4,000 8,000 12,000 16,000 20,000

Scale in Feet 1:69,200 (1 inch = 5,770 feet)

Flight Profile C26A3

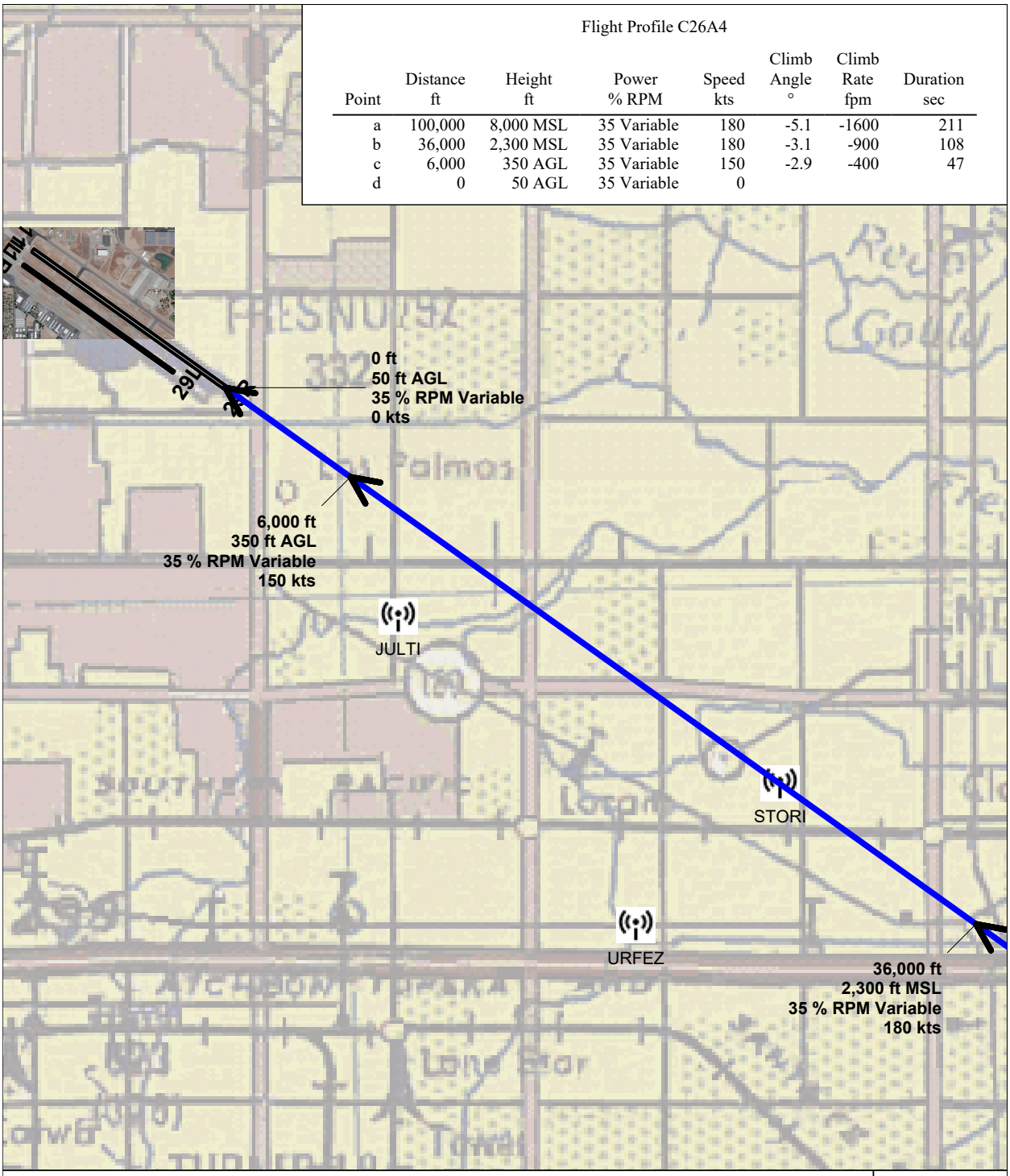
Flight Track: 29LA1 - STRAIGHT IN, Aircraft: Other C-26 (modeled as: BAE-HS-748)

0 4,000 8,000 12,000 16,000 20,000

Scale in Feet 1:69,200 (1 inch = 5,760 feet)

Flight Profile C26A4

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	100,000	8,000 MSL	35 Variable	180	-5.1	-1600	211
b	36,000	2,300 MSL	35 Variable	180	-3.1	-900	108
c	6,000	350 AGL	35 Variable	150	-2.9	-400	47
d	0	50 AGL	35 Variable	0			



Flight Profile C26A4

Flight Track: 29RA1 - STRAIGHT IN, Aircraft: Other C-26 (modeled as: BAE-HS-748)

0 4,000 8,000 12,000 16,000 20,000

Scale in Feet 1:72,400 (1 inch = 6,030 feet)

N

Flight Profile C26D1

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	0 AGL	100 Variable	0	0.0	0	16
b	2,500	0 AGL	100 Variable	180	4.9	1700	58
c	22,000	2,000 MSL	73 Variable	220	0.0	0	210
d	100,000	2,000 MSL	73 Variable	220			

Flight Profile C26D1

Flight Track: 11LD1, Aircraft: Other C-26 (modeled as: BAE-HS-748)

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:160,000 (1 inch = 13,300 feet)

Flight Profile C26D2

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	0 AGL	100 Variable	0	0.0	0	16
b	2,500	0 AGL	100 Variable	180	4.9	1700	58
c	22,000	2,000 MSL	73 Variable	220	0.0	0	210
d	100,000	2,000 MSL	73 Variable	220			

Flight Profile C26D2

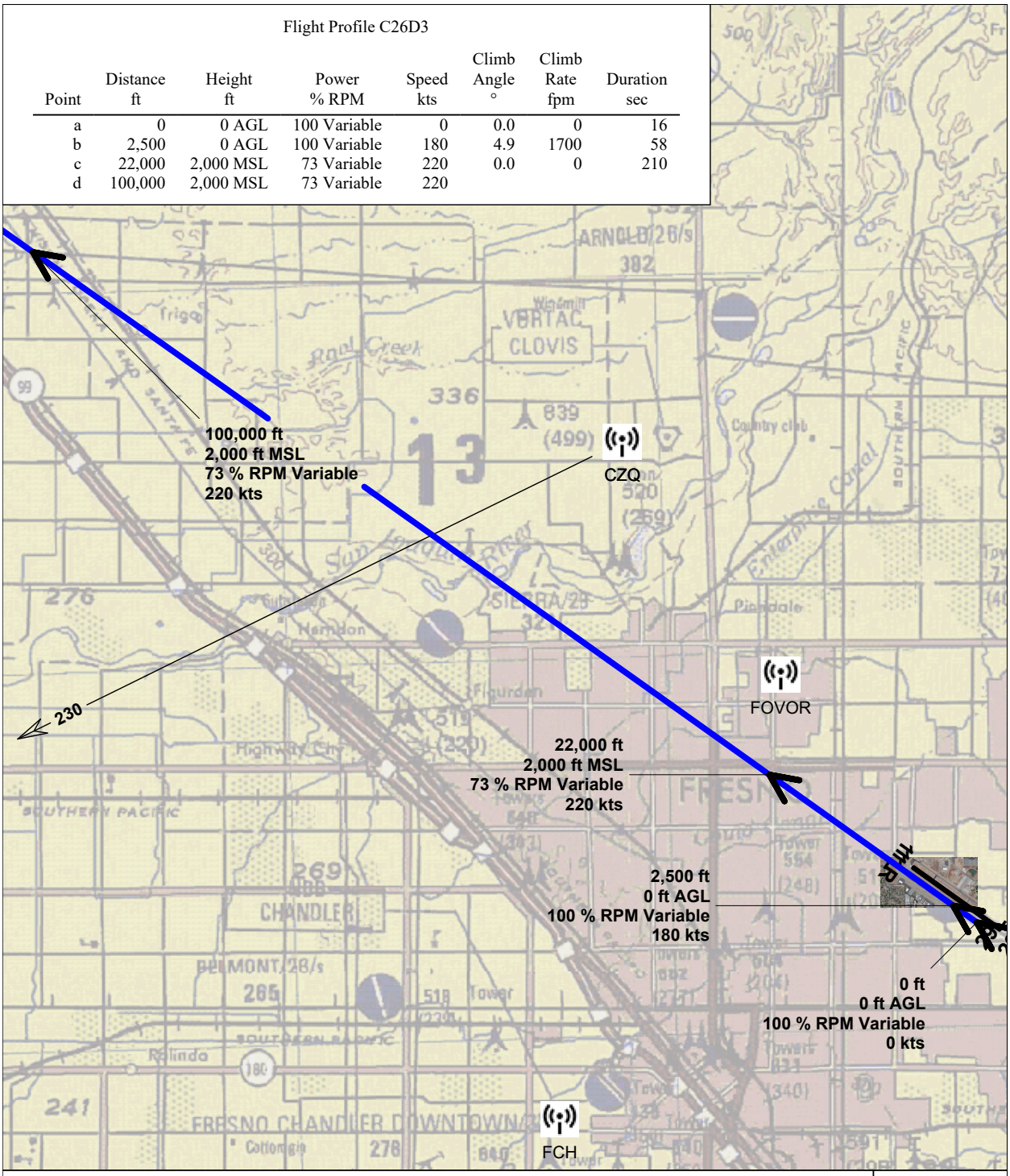
Flight Track: 11RD1, Aircraft: Other C-26 (modeled as: BAE-HS-748)

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:160,000 (1 inch = 13,300 feet)

Flight Profile C26D3

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	0 AGL	100 Variable	0	0.0	0	16
b	2,500	0 AGL	100 Variable	180	4.9	1700	58
c	22,000	2,000 MSL	73 Variable	220	0.0	0	210
d	100,000	2,000 MSL	73 Variable	220			



Flight Profile C26D3

Flight Track: 29LD1, Aircraft: Other C-26 (modeled as: BAE-HS-748)

Scale in Feet 1:160,000 (1 inch = 13,400 feet)

Flight Profile C26D4

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	0 AGL	100 Variable	0	0.0	0	16
b	2,500	0 AGL	100 Variable	180	4.9	1700	58
c	22,000	2,000 MSL	73 Variable	220	0.0	0	210
d	100,000	2,000 MSL	73 Variable	220			

Flight Profile C26D4

Flight Track: 29RD1, Aircraft: Other C-26 (modeled as: BAE-HS-748)

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:160,000 (1 inch = 13,400 feet)

Army Helicopter Flight Profile Maps

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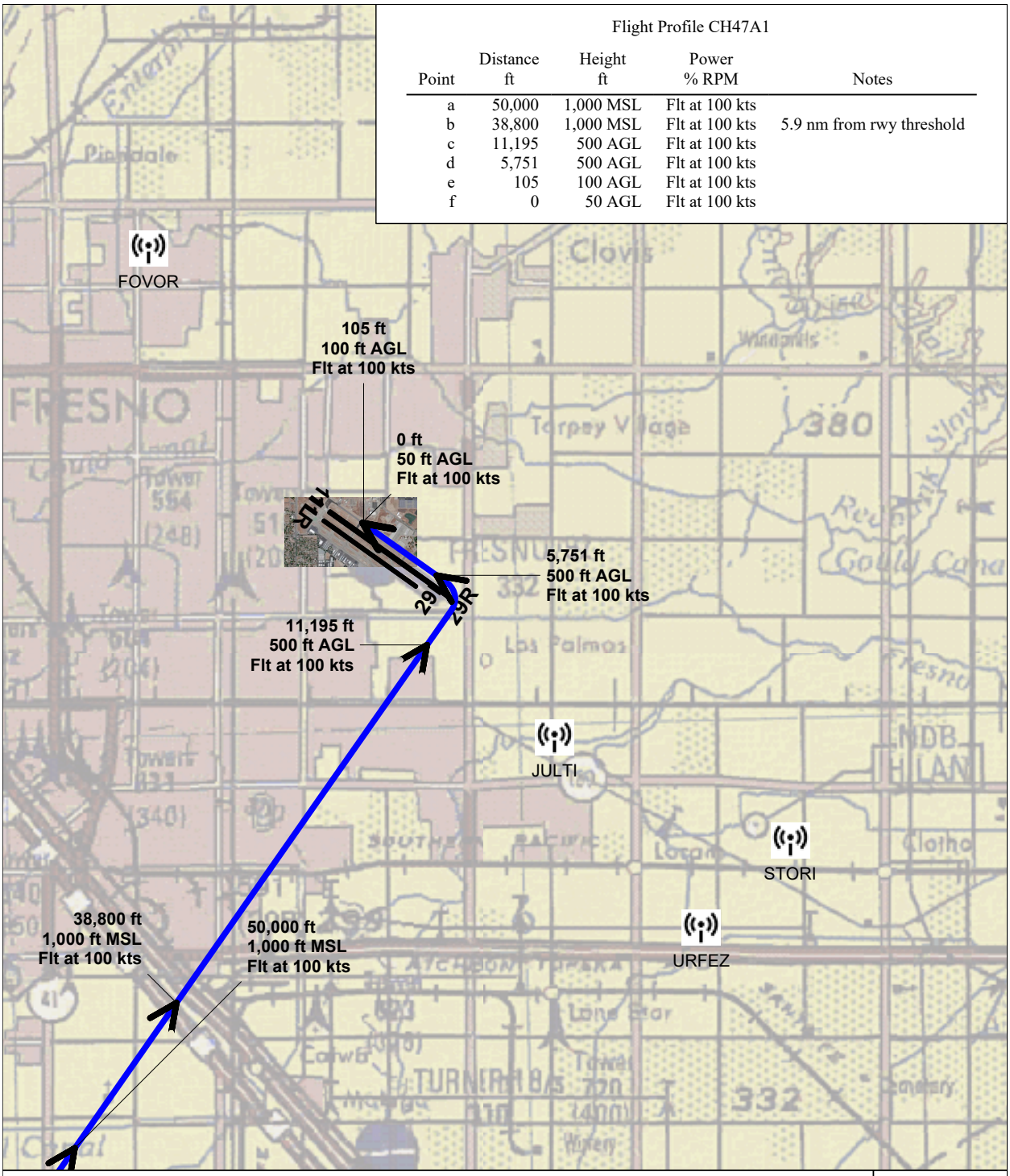
Flight Profile CH47A1

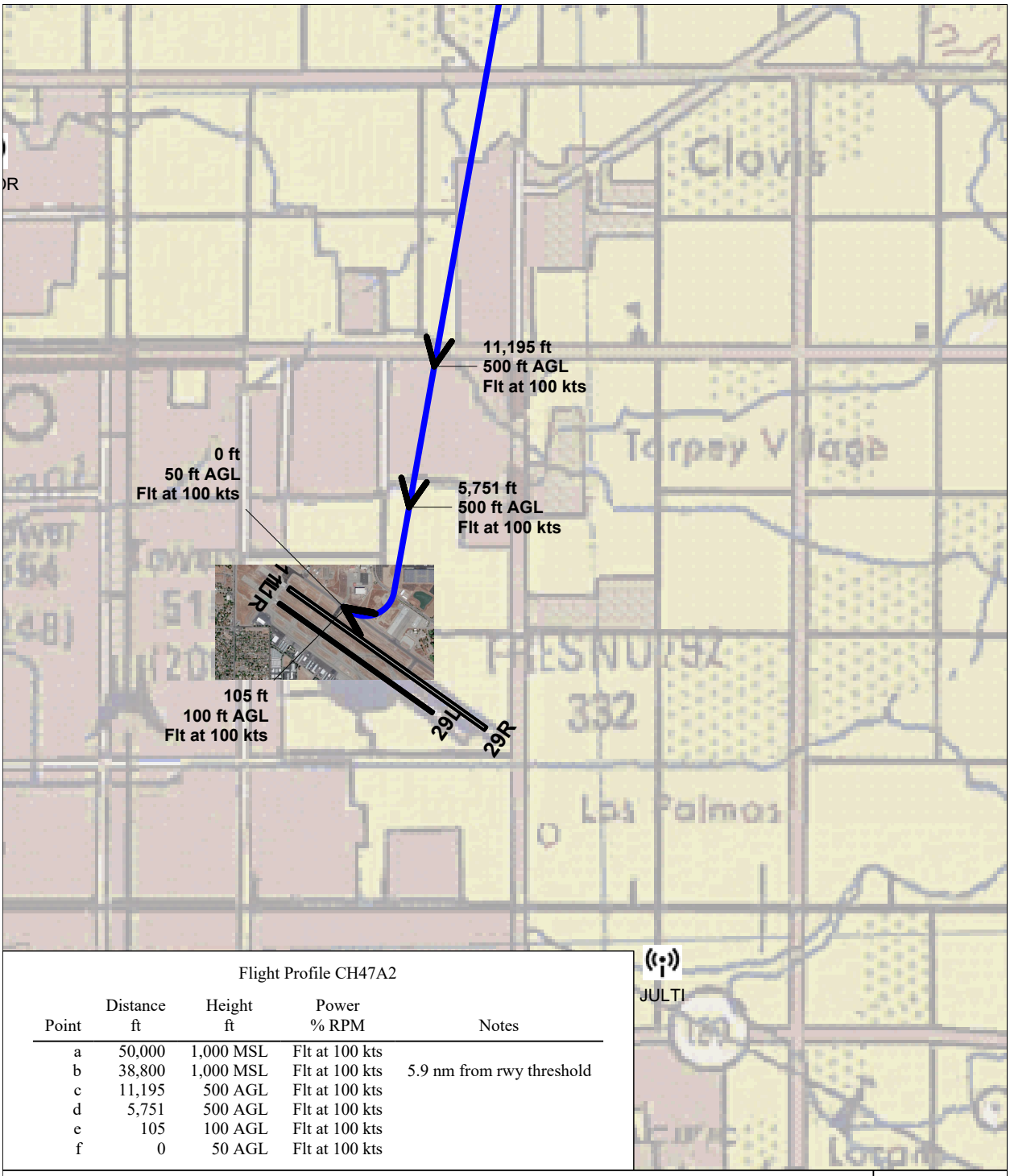
Point	Distance ft	Height ft	Power % RPM	Notes
a	50,000	1,000 MSL	Flt at 100 kts	
b	38,800	1,000 MSL	Flt at 100 kts	5.9 nm from rwy threshold
c	11,195	500 AGL	Flt at 100 kts	
d	5,751	500 AGL	Flt at 100 kts	
e	105	100 AGL	Flt at 100 kts	
f	0	50 AGL	Flt at 100 kts	



Flight Profile CH47A1

Flight Track: HA1 Aircraft: Other CH-47C Engine: T55-L-11

Scale in Feet 1:117,000 (1 inch = 9,780 feet)



Flight Profile CH47A2

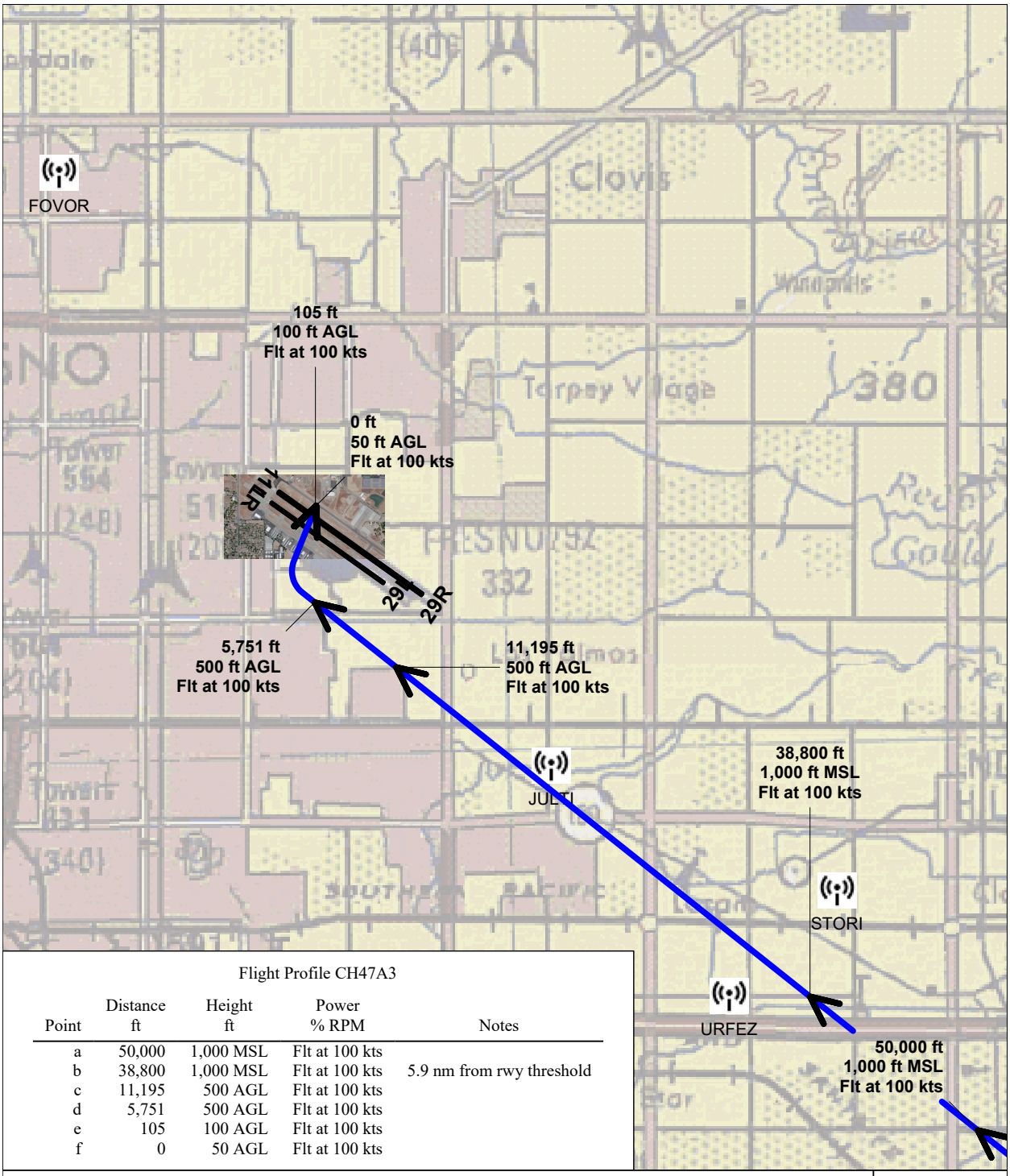
Point	Distance ft	Height ft	Power % RPM	Notes
a	50,000	1,000 MSL	Flt at 100 kts	
b	38,800	1,000 MSL	Flt at 100 kts	5.9 nm from rwy threshold
c	11,195	500 AGL	Flt at 100 kts	
d	5,751	500 AGL	Flt at 100 kts	
e	105	100 AGL	Flt at 100 kts	
f	0	50 AGL	Flt at 100 kts	

Flight Profile CH47A2

Flight Track: HA2 Aircraft: Other CH-47C Engine: T55-L-11

0 4,000 8,000 12,000 16,000 20,000

Scale in Feet 1:70,800 (1 inch = 5,900 feet)



Flight Profile CH47A3

Point	Distance ft	Height ft	Power % RPM	Notes
a	50,000	1,000 MSL	Flt at 100 kts	
b	38,800	1,000 MSL	Flt at 100 kts	5.9 nm from rwy threshold
c	11,195	500 AGL	Flt at 100 kts	
d	5,751	500 AGL	Flt at 100 kts	
e	105	100 AGL	Flt at 100 kts	
f	0	50 AGL	Flt at 100 kts	

Flight Profile CH47A3

Flight Track: HA3 Aircraft: Other CH-47C Engine: T55-L-11

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000

Scale in Feet 1:96,900 (1 inch = 8,070 feet)

Flight Profile CH47A4

Point	Distance ft	Height ft	Power % RPM	Notes
a	50,000	1,000 MSL	Flt at 100 kts	
b	38,800	1,000 MSL	Flt at 100 kts	5.9 nm from rwy threshold
c	11,195	500 AGL	Flt at 100 kts	
d	5,751	500 AGL	Flt at 100 kts	
e	105	100 AGL	Flt at 100 kts	
f	0	50 AGL	Flt at 100 kts	

Flight Profile CH47A4

Flight Track: HA4 Aircraft: Other CH-47C Engine: T55-L-11

0 4,000 8,000 12,000 16,000 20,000

Scale in Feet 1:69,900 (1 inch = 5,820 feet)

Flight Profile CH47D1

Point	Distance ft	Height ft	Power % RPM
a	0	0 AGL	Flt at 100 kts
b	105	0 AGL	Flt at 100 kts
c	1,775	500 AGL	Flt at 100 kts
d	10,000	1,500 MSL	Flt at 100 kts
e	50,000	1,500 MSL	Flt at 100 kts

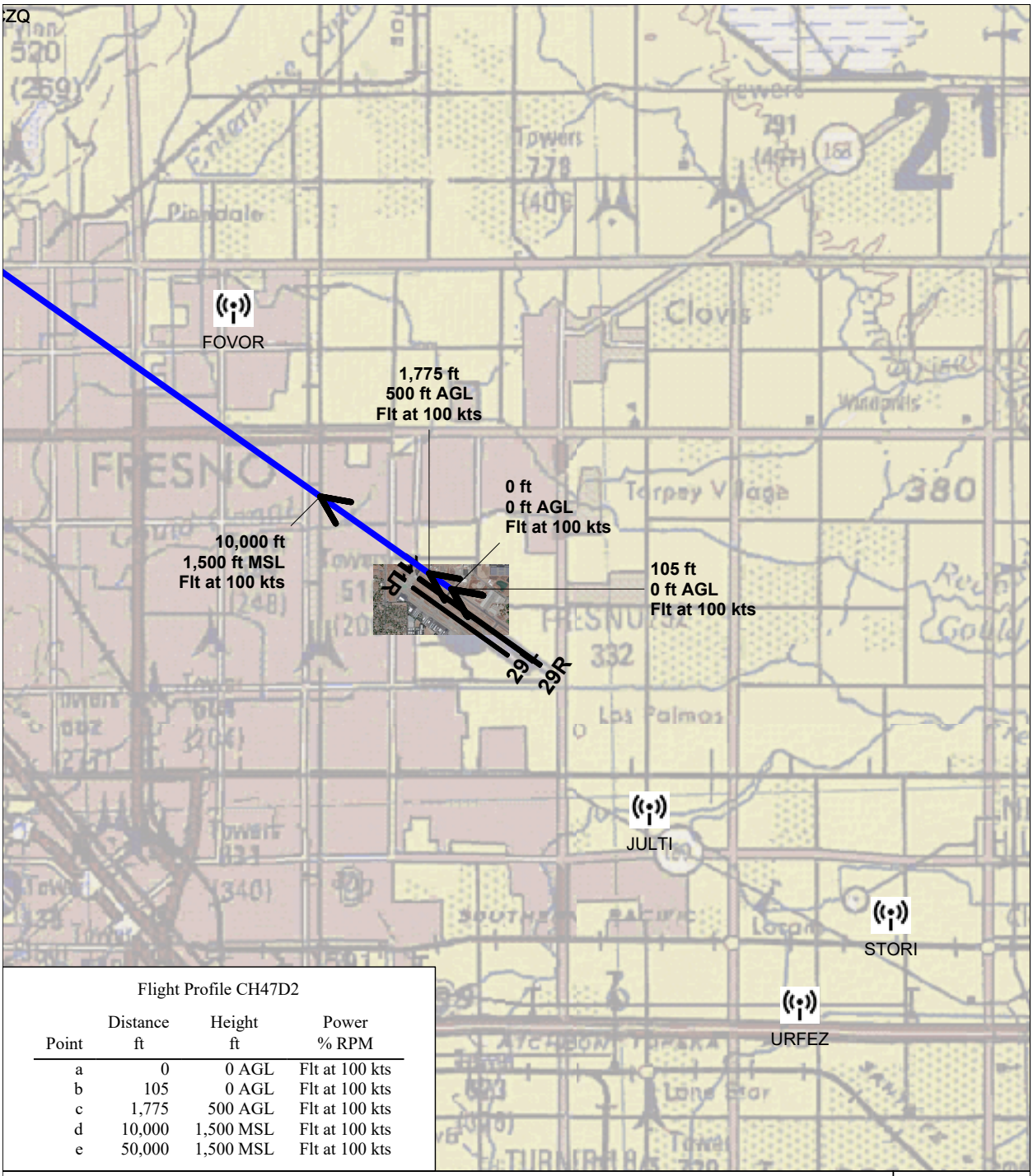
Flight Profile CH47D1

CH47 turn left - RWY 11 Flow

Flight Track: HD1 Aircraft: Other CH-47C Engine: T55-L-11

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

Scale in Feet 1:117,000 (1 inch = 9,760 feet)



Flight Profile CH47D2

Point	Distance ft	Height ft	Power % RPM
a	0	0 AGL	Flt at 100 kts
b	105	0 AGL	Flt at 100 kts
c	1,775	500 AGL	Flt at 100 kts
d	10,000	1,500 MSL	Flt at 100 kts
e	50,000	1,500 MSL	Flt at 100 kts

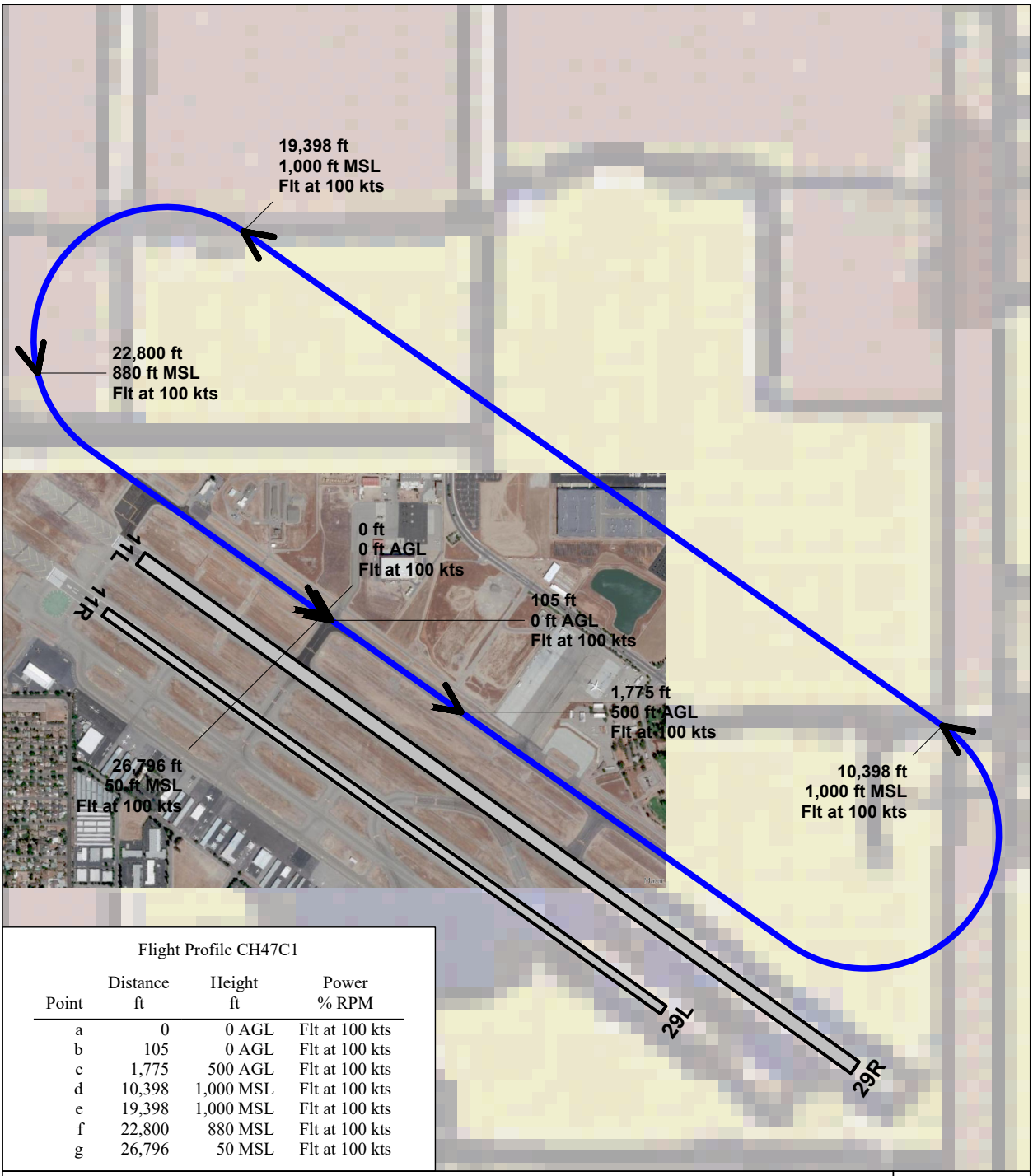
Flight Profile CH47D2

CH47 depart - RWY 29 Flow

Flight Track: HD2 Aircraft: Other CH-47C Engine: T55-L-11

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

Scale in Feet 1:117,000 (1 inch = 9,760 feet)



Flight Profile CH47C1

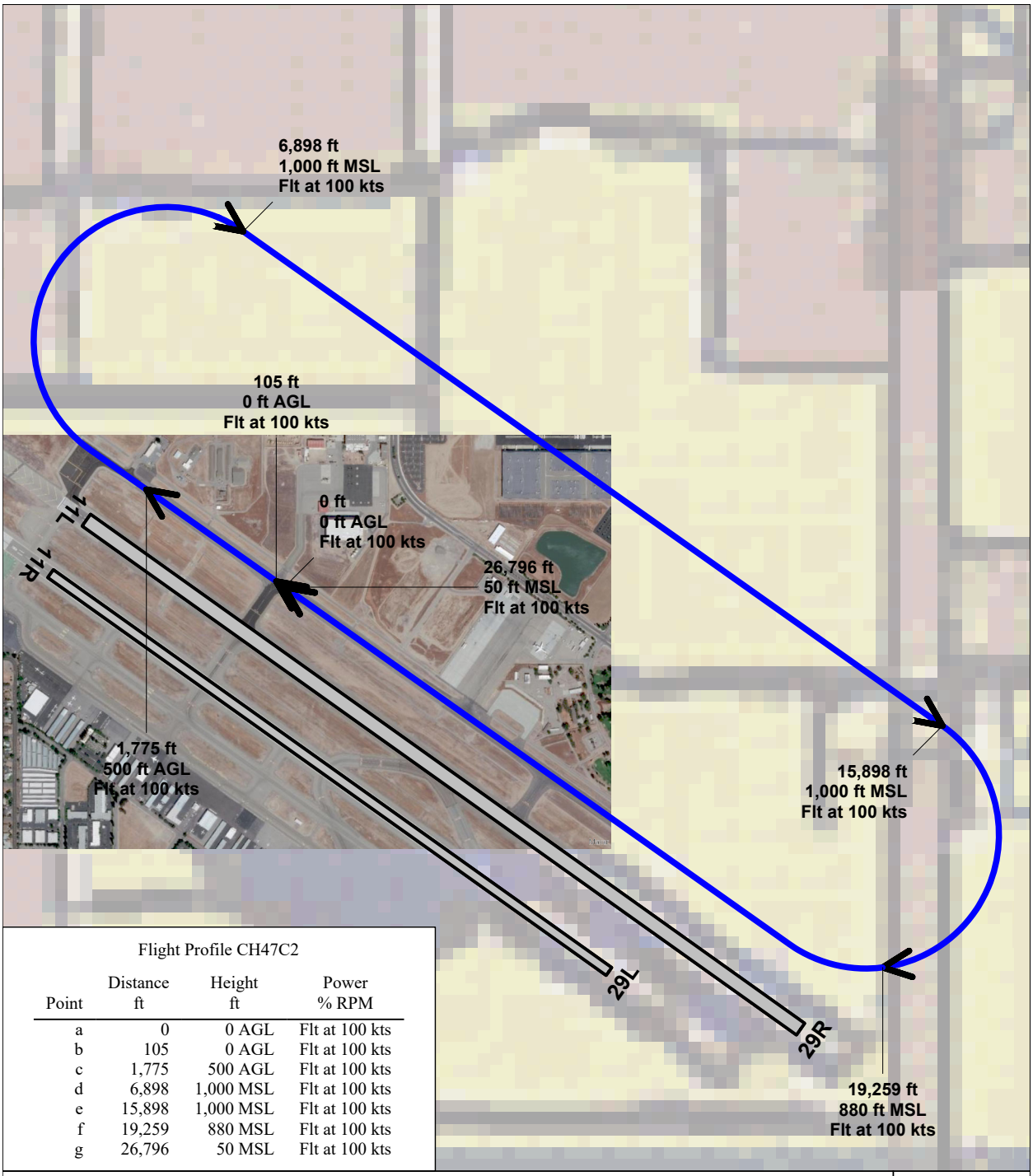
Point	Distance ft	Height ft	Power % RPM
a	0	0 AGL	Flt at 100 kts
b	105	0 AGL	Flt at 100 kts
c	1,775	500 AGL	Flt at 100 kts
d	10,398	1,000 MSL	Flt at 100 kts
e	19,398	1,000 MSL	Flt at 100 kts
f	22,800	880 MSL	Flt at 100 kts
g	26,796	50 MSL	Flt at 100 kts

Flight Profile CH47C1
closed pattern
Flight Track: 11LCP2 Aircraft: Other CH-47C Engine: T55-L-11

0 1,000 2,000 3,000 4,000 5,000 6,000

Scale in Feet 1:19,900 (1 inch = 1,660 feet)

N



Flight Profile CH47C2

Point	Distance ft	Height ft	Power % RPM
a	0	0 AGL	Flt at 100 kts
b	105	0 AGL	Flt at 100 kts
c	1,775	500 AGL	Flt at 100 kts
d	6,898	1,000 MSL	Flt at 100 kts
e	15,898	1,000 MSL	Flt at 100 kts
f	19,259	880 MSL	Flt at 100 kts
g	26,796	50 MSL	Flt at 100 kts

Flight Profile CH47C2

closed pattern

Flight Track: 29RCP2 Aircraft: Other CH-47C Engine: T55-L-11

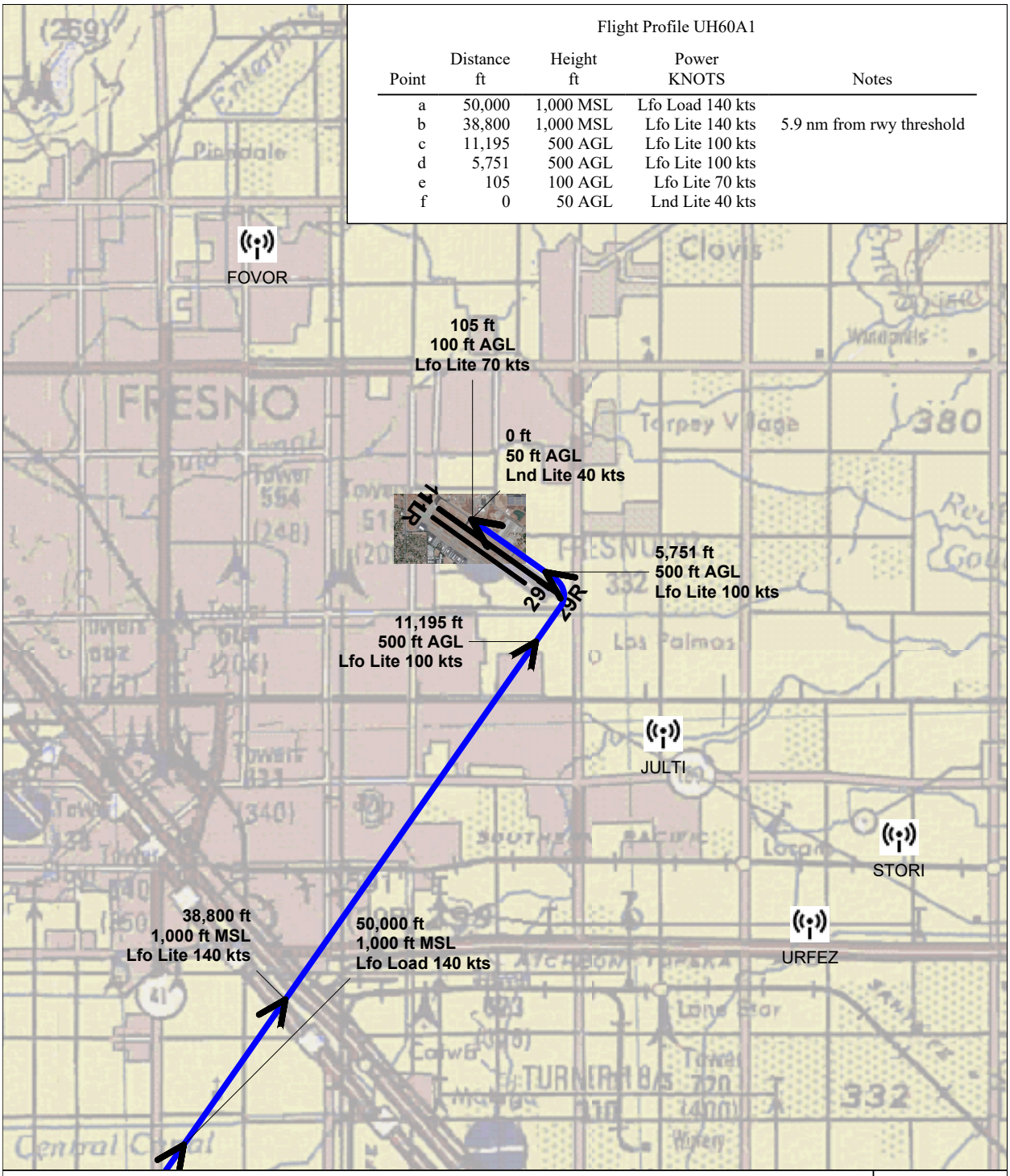
0 1,000 2,000 3,000 4,000 5,000 6,000

Scale in Feet 1:19,900 (1 inch = 1,660 feet)

N

Flight Profile UH60A1

Point	Distance ft	Height ft	Power KNOTS	Notes
a	50,000	1,000 MSL	Lfo Load 140 kts	
b	38,800	1,000 MSL	Lfo Lite 140 kts	5.9 nm from rwy threshold
c	11,195	500 AGL	Lfo Lite 100 kts	
d	5,751	500 AGL	Lfo Lite 100 kts	
e	105	100 AGL	Lfo Lite 70 kts	
f	0	50 AGL	Lnd Lite 40 kts	

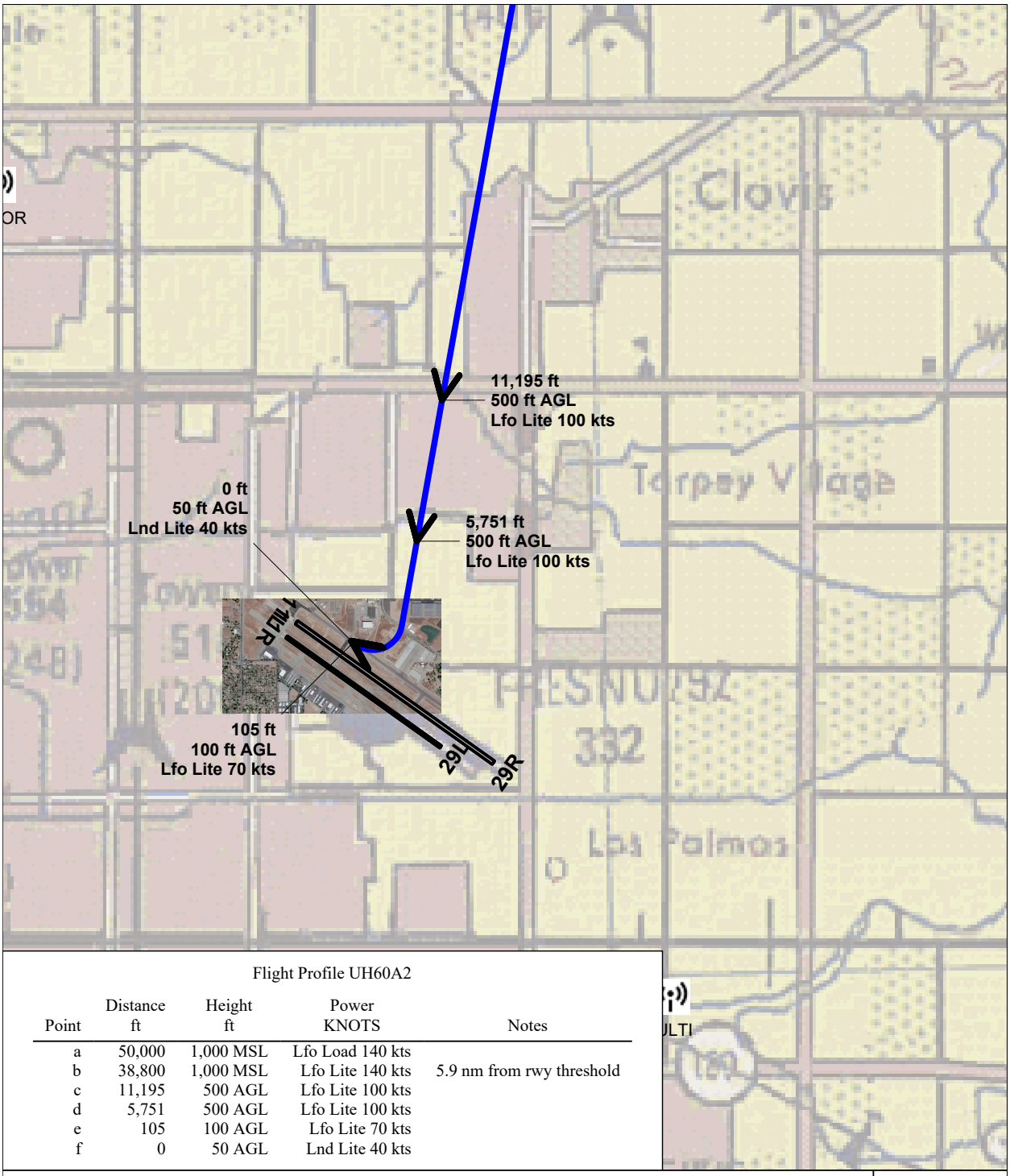


Flight Profile UH60A1

Flight Track: HA1 Aircraft: Other UH60A Engine: T700-CE-700

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

Scale in Feet 1:117,000 (1 inch = 9,780 feet)



Flight Profile UH60A2

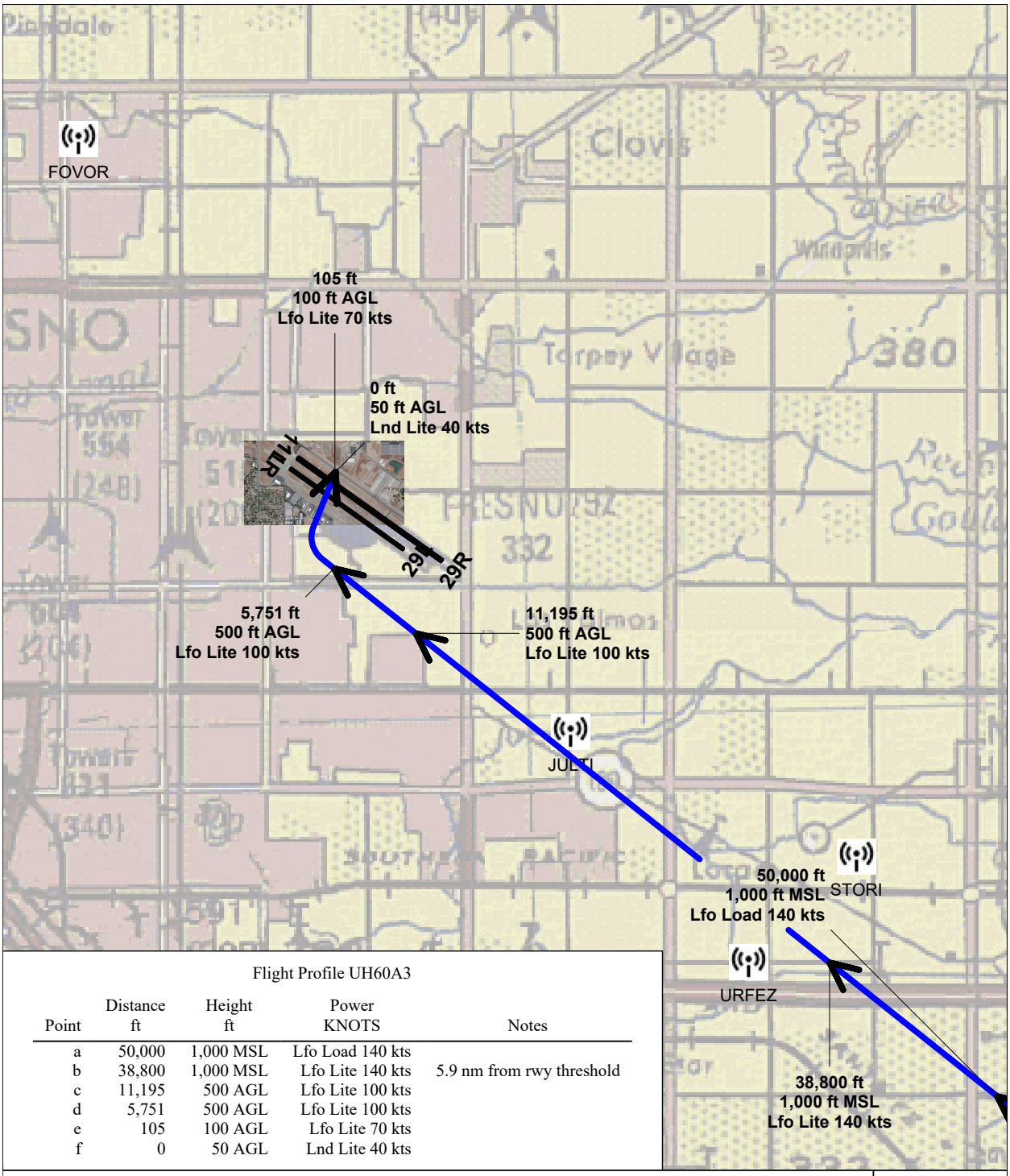
Point	Distance ft	Height ft	Power KNOTS	Notes
a	50,000	1,000 MSL	Lfo Load 140 kts	
b	38,800	1,000 MSL	Lfo Lite 140 kts	5.9 nm from rwy threshold
c	11,195	500 AGL	Lfo Lite 100 kts	
d	5,751	500 AGL	Lfo Lite 100 kts	
e	105	100 AGL	Lfo Lite 70 kts	
f	0	50 AGL	Lnd Lite 40 kts	

Flight Profile UH60A2

Flight Track: HA2 Aircraft: Other UH60A Engine: T700-CE-700

0 4,000 8,000 12,000 16,000 20,000

Scale in Feet 1:70,800 (1 inch = 5,900 feet)



Flight Profile UH60A3

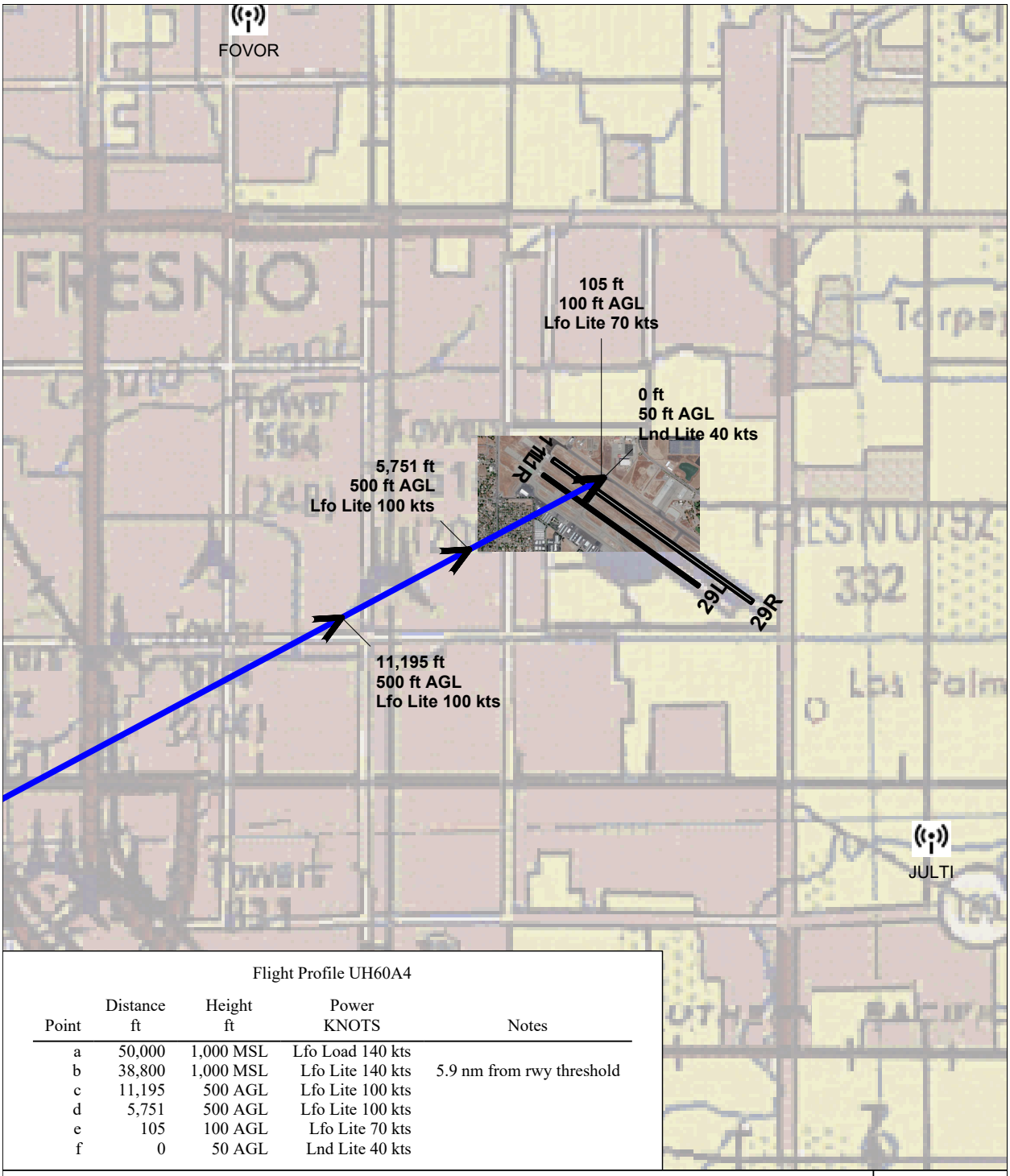
Point	Distance ft	Height ft	Power KNOTS	Notes
a	50,000	1,000 MSL	Lfo Load 140 kts	
b	38,800	1,000 MSL	Lfo Lite 140 kts	5.9 nm from rwy threshold
c	11,195	500 AGL	Lfo Lite 100 kts	
d	5,751	500 AGL	Lfo Lite 100 kts	
e	105	100 AGL	Lfo Lite 70 kts	
f	0	50 AGL	Lnd Lite 40 kts	

Flight Profile UH60A3

Flight Track: HA3 Aircraft: Other UH60A Engine: T700-CE-700

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000

Scale in Feet 1:96,900 (1 inch = 8,070 feet)



Flight Profile UH60A4

Point	Distance ft	Height ft	Power KNOTS	Notes
a	50,000	1,000 MSL	Lfo Load 140 kts	
b	38,800	1,000 MSL	Lfo Lite 140 kts	5.9 nm from rwy threshold
c	11,195	500 AGL	Lfo Lite 100 kts	
d	5,751	500 AGL	Lfo Lite 100 kts	
e	105	100 AGL	Lfo Lite 70 kts	
f	0	50 AGL	Lnd Lite 40 kts	

Flight Profile UH60A4

Flight Track: HA4 Aircraft: Other UH60A Engine: T700-CE-700

0 4,000 8,000 12,000 16,000 20,000

Scale in Feet 1:69,900 (1 inch = 5,820 feet)

Flight Profile UH60D2

Point	Distance ft	Height ft	Power KNOTS
a	0	0 AGL	Tkf Load 40 kts
b	105	0 AGL	Lfo Load 70 kts
c	1,775	500 AGL	Lfo Load 70 kts
d	10,000	1,500 MSL	Lfo Load 140 kts
e	50,000	1,500 MSL	Lfo Load 140 kts

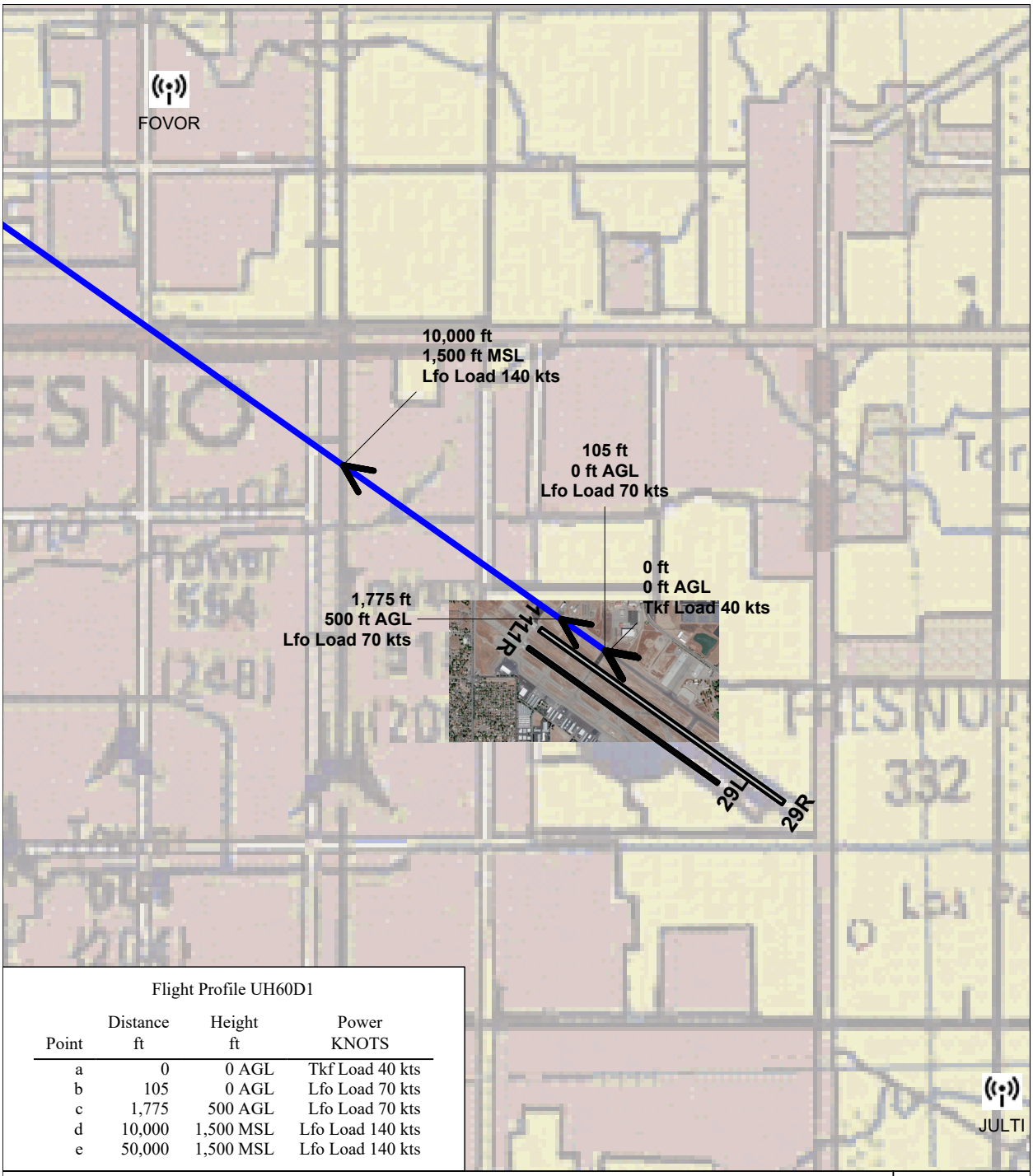
Flight Profile UH60D2

UH60 turn left - RWY 11 Flow

Flight Track: HD1 Aircraft: Other UH60A Engine: T700-CE-700

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

Scale in Feet 1:117,000 (1 inch = 9,760 feet)



Flight Profile UH60D1

Point	Distance ft	Height ft	Power KNOTS
a	0	0 AGL	Tkf Load 40 kts
b	105	0 AGL	Lfo Load 70 kts
c	1,775	500 AGL	Lfo Load 70 kts
d	10,000	1,500 MSL	Lfo Load 140 kts
e	50,000	1,500 MSL	Lfo Load 140 kts

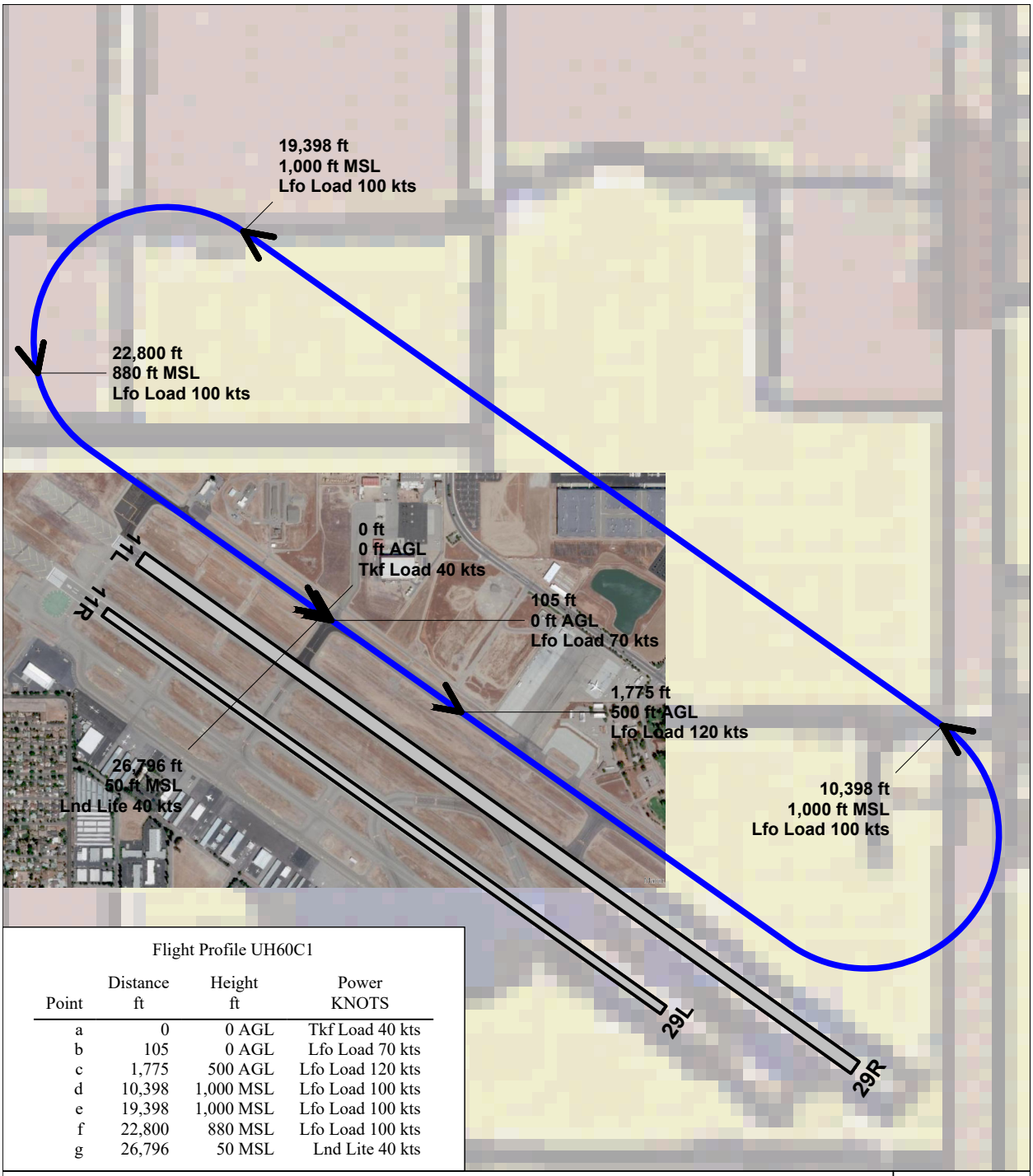
Flight Profile UH60D1

UH60 depart - RWY 29 Flow

Flight Track: HD2 Aircraft: Other UH60A Engine: T700-CE-700

0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000 18,000 20,000

Scale in Feet 1:58,600 (1 inch = 4,880 feet)



Flight Profile UH60C1

Point	Distance ft	Height ft	Power KNOTS
a	0	0 AGL	Tkf Load 40 kts
b	105	0 AGL	Lfo Load 70 kts
c	1,775	500 AGL	Lfo Load 120 kts
d	10,398	1,000 MSL	Lfo Load 100 kts
e	19,398	1,000 MSL	Lfo Load 100 kts
f	22,800	880 MSL	Lfo Load 100 kts
g	26,796	50 MSL	Lnd Lite 40 kts

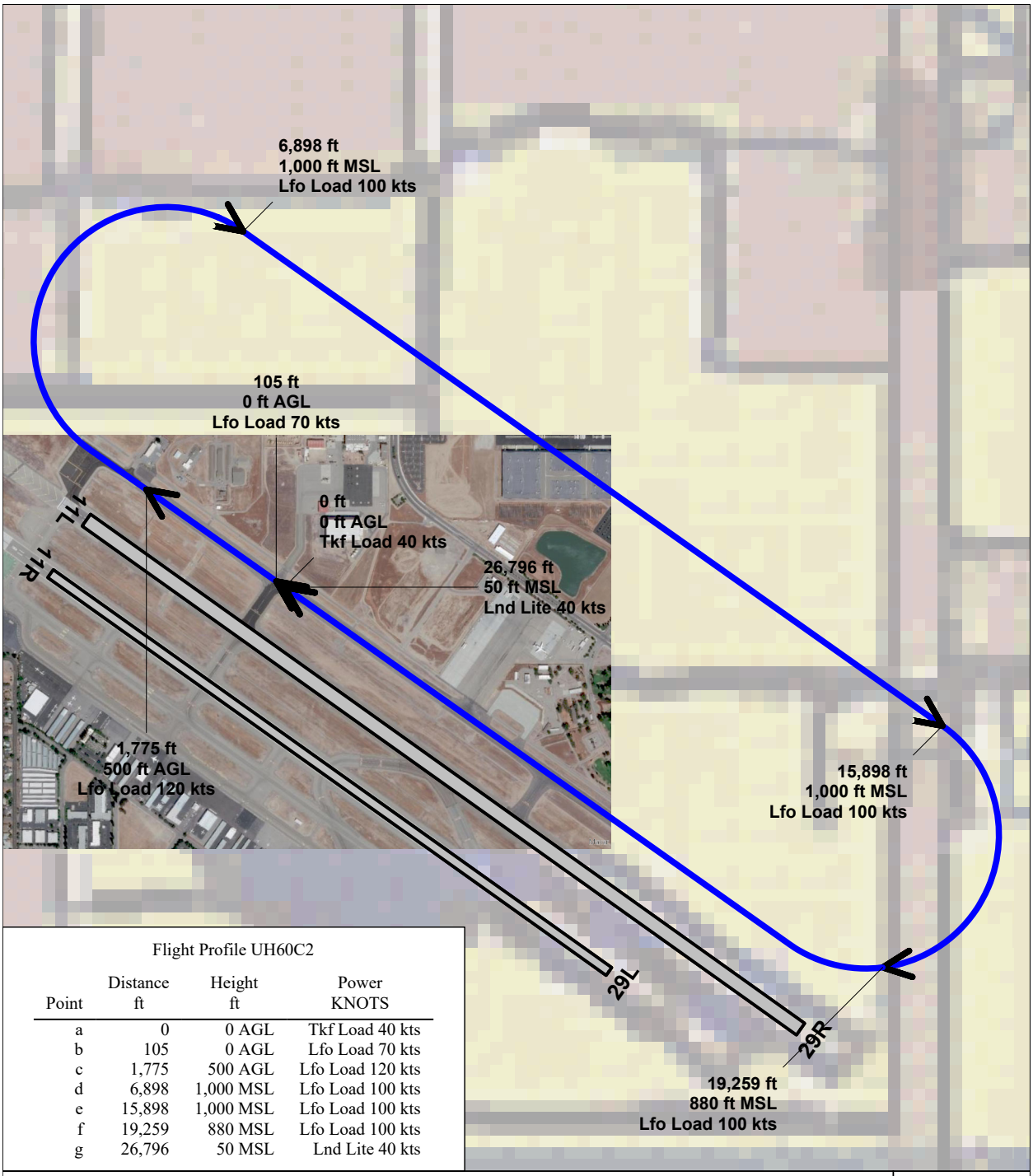
Flight Profile UH60C1

closed pattern

Flight Track: 11LCP2 Aircraft: Other UH60A Engine: T700-CE-700

0 1,000 2,000 3,000 4,000 5,000 6,000

Scale in Feet 1:19,900 (1 inch = 1,660 feet)



Flight Profile UH60C2

Point	Distance ft	Height ft	Power KNOTS
a	0	0 AGL	Tkf Load 40 kts
b	105	0 AGL	Lfo Load 70 kts
c	1,775	500 AGL	Lfo Load 120 kts
d	6,898	1,000 MSL	Lfo Load 100 kts
e	15,898	1,000 MSL	Lfo Load 100 kts
f	19,259	880 MSL	Lfo Load 100 kts
g	26,796	50 MSL	Lnd Lite 40 kts

Flight Profile UH60C2

closed pattern

Flight Track: 29RCP2 Aircraft: Other UH60A Engine: T700-CE-700

0 1,000 2,000 3,000 4,000 5,000 6,000

Scale in Feet 1:19,900 (1 inch = 1,660 feet)

Table A-2 Modeled Annual Civil Operations by Aircraft for All Scenarios

Aircraft Type and Series	*Aircraft ID*	*FAA Tower Category*	*Arrival*				*Departure*				*Total*
			Day	*Eve*	*Night*	*Total*	*Day*	*Eve*	*Night*	*Total*	
Airbus A320-200 Series	A320-232	Air Carrier	164	19	438	620	58	148	414	620	1,241
Boeing 737-700 Series	73700	Air Carrier	24	2	20	46	31	2	13	46	92
Boeing 737-800 Series	737800	Air Carrier	15	-	194	210	15	2	193	210	419
Boeing 757-200 Series	757PW	Air Carrier	529	53	6	588	27	554	6	588	1,176
Boeing MD-82	MD82	Air Carrier	231	41	219	491	482	6	4	492	983
Boeing MD-83	MD83	Air Carrier	444	156	153	753	481	218	54	753	1,506
Bombardier Challenger 600	CL600	Air Taxi	51	19	6	75	52	19	2	73	148
Bombardier Challenger 601	CL600	Air Taxi	1,458	483	867	2,808	1,989	723	95	2,807	5,615
Bombardier de Havilland Dash 8 Q400	DHC830	Air Carrier	2,448	1,105	2,149	5,702	4,291	1,270	139	5,701	11,403
Bombardier Learjet 35A/36A (C-21A)	LEAR35	Air Taxi	255	52	23	330	265	54	12	331	661
Britten-Norman BN-2 Islander	BEC58P	General Aviation	212	134	31	377	209	126	41	376	753
Cessna 172 Skyhawk	CNA172	General Aviation	308	475	316	1,099	1,076	512	388	1,977	3,076
Cessna 182	CNA182	General Aviation	1,152	331	78	1,562	1,101	313	149	1,562	3,124
Cessna 206	CNA208	General Aviation	1,840	765	136	2,742	2,098	372	273	2,744	5,485
Cessna 208 Caravan	CNA208	General Aviation	1,704	282	73	2,059	1,763	272	25	2,060	4,120
Cessna 441 Conquest II	CNA441	General Aviation	727	272	123	1,122	784	219	119	1,122	2,244
Cessna 500 Citation I	CNA510	Air Taxi	85	31	10	125	89	25	9	123	248
Cessna 560 Citation XLS	CNA560XL	Air Taxi	149	50	19	218	165	42	12	219	438
Cessna 750 Citation X	CNA750	Air Taxi	73	23	8	104	85	16	2	104	208
CESSNA CITATION 510	CNA750	Air Taxi	203	89	28	320	211	85	21	317	637
DeHavilland DHC-6-200 Twin Otter	DHC6	Air Taxi	22	32	1	55	17	36	2	55	110
Dornier 228-200 Series	DHC6	Air Taxi	197	49	13	259	199	45	15	259	517
EADS Socata TB-9 Tampico	GASEPF	Air Taxi	533	969	339	1,841	1,345	363	132	1,840	3,681
Eclipse 500 / PW610F	ECLIPSE500	Air Taxi	73	56	16	144	119	23	2	144	288
Embraer EMB120 Brasilia	EMB120	General Aviation	920	582	487	1,989	1,529	400	99	2,029	4,017
Embraer ERJ145	EMB14L	Air Taxi	18	10	3	31	19	12	1	31	62
Embraer ERJ195-LR	EMB195	Air Carrier	14	14	2	30	8	18	4	30	60
Eurocopter EC-130	S76	General Aviation	1,263	1,531	1,033	3,827	2,181	1,109	536	3,826	7,653
Gulfstream G550	GV	Air Taxi	21	14	3	38	31	5	3	39	77
Gulfstream IV-SP	GIV	Air Taxi	68	28	16	113	89	22	2	113	226
Piper PA-24 Comanche	PA31	General Aviation	2,567	1,007	367	3,942	2,926	816	198	3,940	7,882
Piper PA-28 Cherokee Series	GASEPF	General Aviation	1,487	628	194	2,310	1,826	404	81	2,312	4,622
Raytheon Beech Baron 58	BEC58P	General Aviation	2,238	1,109	472	3,819	2,876	743	201	3,820	7,639
Grand Total			**21,493**	**10,410**	**7,845**	**39,748**	**28,439**	**8,976**	**3,248**	**40,663**	**80,411**

Table A-3 Civil Aircraft Modeled Departure Runway Utilization for All Scenarios

Aircraft Type and Series	*Aircraft ID*	*FAA Tower Category*	*11L*	*11R*	*29L*	*29R*
Airbus A320-200 Series	A320-232	Air Carrier	1%	4%	35%	59%
Boeing 737-700 Series	73700	Air Carrier	2%	8%	38%	51%
Boeing 737-800 Series	737800	Air Carrier	1%	4%	29%	66%
Boeing 757-200 Series	757PW	Air Carrier	1%	3%	53%	43%
Boeing MD-82	MD82	Air Carrier	3%	10%	42%	45%
Boeing MD-83	MD83	Air Carrier	2%	7%	44%	46%
Bombardier Challenger 600	CL600	Air Taxi	2%	8%	45%	45%
Bombardier Challenger 601	CL600	Air Taxi	2%	8%	45%	45%
Bombardier de Havilland Dash 8 Q400	DHC830	Air Carrier	2%	8%	44%	45%
Bombardier Learjet 35A/36A (C-21A)	LEAR35	Air Taxi	2%	9%	43%	46%
Britten-Norman BN-2 Islander	BEC58P	General Aviation	2%	7%	44%	47%
Cessna 172 Skyhawk	CNA172	General Aviation	2%	7%	42%	49%
Cessna 182	CNA182	General Aviation	2%	8%	43%	47%
Cessna 206	CNA208	General Aviation	2%	8%	42%	47%
Cessna 208 Caravan	CNA208	General Aviation	2%	9%	43%	45%
Cessna 441 Conquest II	CNA441	General Aviation	2%	8%	43%	47%
Cessna 500 Citation I	CNA510	Air Taxi	2%	8%	43%	46%
Cessna 560 Citation XLS	CNA560XL	Air Taxi	2%	8%	43%	46%
Cessna 750 Citation X	CNA750	Air Taxi	2%	9%	44%	45%
CESSNA CITATION 510	CNA750	Air Taxi	2%	8%	44%	46%
DeHavilland DHC-6-200 Twin Otter	DHC6	Air Taxi	1%	5%	49%	44%
Dornier 228-200 Series	DHC6	Air Taxi	2%	8%	43%	46%
EADS Socata TB-9 Tampico	GASEPF	Air Taxi	2%	8%	43%	46%
Eclipse 500 / PW610F	ECLIPSE500	Air Taxi	2%	9%	44%	45%
Embraer EMB120 Brasilia	EMB120	General Aviation	2%	8%	44%	46%
Embraer ERJ145	EMB14L	Air Taxi	2%	7%	46%	45%
Embraer ERJ195-LR	EMB195	Air Carrier	1%	5%	47%	47%
Eurocopter EC-130	S76	General Aviation	2%	7%	43%	48%
Gulfstream G550	GV	Air Taxi	2%	9%	42%	47%
Gulfstream IV-SP	GIV	Air Taxi	2%	9%	44%	45%
Piper PA-24 Comanche	PA31	General Aviation	2%	8%	44%	46%
Piper PA-28 Cherokee Series	GASEPF	General Aviation	2%	9%	44%	46%
Raytheon Beech Baron 58	BEC58P	General Aviation	2%	8%	44%	46%
Grand Total			**2%**	**8%**	**43%**	**46%**

Legend: % = percent.

Table A-4 Civil Aircraft Modeled Arrival Runway Utilization for All Scenarios

Aircraft Type and Series	*Aircraft ID*	*FAA Tower Category*	*11L*	*11R*	*29L*	*29R*
Airbus A320-200 Series	A320-232	Air Carrier	3%	2%	25%	69%
Boeing 737-700 Series	73700	Air Carrier	5%	3%	28%	63%
Boeing 737-800 Series	737800	Air Carrier	2%	1%	22%	74%
Boeing 757-200 Series	757PW	Air Carrier	8%	5%	33%	55%
Boeing MD-82	MD82	Air Carrier	5%	3%	27%	65%
Boeing MD-83	MD83	Air Carrier	6%	4%	29%	62%
Bombardier Challenger 600	CL600	Air Taxi	6%	4%	30%	59%
Bombardier Challenger 601	CL600	Air Taxi	5%	3%	28%	63%
Bombardier de Havilland Dash 8 Q400	DHC830	Air Carrier	5%	3%	27%	65%
Bombardier Learjet 35A/36A (C-21A)	LEAR35	Air Taxi	7%	5%	31%	57%
Britten-Norman BN-2 Islander	BEC58P	General Aviation	6%	4%	29%	62%
Cessna 172 Skyhawk	CNA172	General Aviation	4%	2%	26%	68%
Cessna 182	CNA182	General Aviation	7%	4%	31%	58%
Cessna 206	CNA208	General Aviation	6%	4%	30%	59%
Cessna 208 Caravan	CNA208	General Aviation	7%	5%	32%	56%
Cessna 441 Conquest II	CNA441	General Aviation	6%	4%	30%	60%
Cessna 500 Citation I	CNA510	Air Taxi	6%	4%	30%	59%
Cessna 560 Citation XLS	CNA560XL	Air Taxi	6%	4%	30%	59%
Cessna 750 Citation X	CNA750	Air Taxi	6%	4%	30%	59%
CESSNA CITATION 510	CNA750	Air Taxi	6%	4%	30%	60%
DeHavilland DHC-6-200 Twin Otter	DHC6	Air Taxi	5%	3%	28%	65%
Dornier 228-200 Series	DHC6	Air Taxi	7%	4%	31%	58%
EADS Socata TB-9 Tampico	GASEPF	Air Taxi	4%	2%	26%	67%
Eclipse 500 / PW610F	ECLIPSE500	Air Taxi	5%	3%	28%	63%
Embraer EMB120 Brasilia	EMB120	General Aviation	5%	3%	28%	64%
Embraer ERJ145	EMB14L	Air Taxi	6%	4%	29%	61%
Embraer ERJ195-LR	EMB195	Air Carrier	5%	3%	28%	64%
Eurocopter EC-130	S76	General Aviation	4%	3%	26%	67%
Gulfstream G550	GV	Air Taxi	6%	4%	29%	62%
Gulfstream IV-SP	GIV	Air Taxi	6%	4%	29%	61%
Piper PA-24 Comanche	PA31	General Aviation	6%	4%	30%	60%
Piper PA-28 Cherokee Series	GASEPF	General Aviation	6%	4%	30%	60%
Raytheon Beech Baron 58	BEC58P	General Aviation	6%	4%	29%	61%
Grand Total			**5%**	**3%**	**29%**	**62%**

Legend: % = percent.

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Table A-5 TAF Analysis: FAT CY 2022 Fleet Mix

FAA Tower Category	AEDT Equipment ID	AEDT ANP Type	Representative Aircraft	Departures				Arrivals				Local			
				Day	Evening	Night	Total	Day	Evening	Night	Total	Day	Evening	Night	Total
Air Carrier	176	737700	Boeing 737-600 Series, Boeing 737-700 Series, Antonov 148-100A, MC-21-200, Antonov 148-100B, Antonov 148-100E, SMR80, Airbus A220-100, Boeing 737-700 Freighter, Airbus A220-300, Boeing 737-700C, Bombardier CS100, Bombardier CS300, Boeing C-40	6.1%	1.8%	3.3%	11.2%	4.8%	2.3%	4.1%	11.2%	0.0%	0.0%	0.0%	0.0%
	4089	757PW	Boeing 757-200 Series, Boeing 757-200 Series Freighter	1.4%	0.0%	0.2%	1.6%	1.2%	0.0%	0.4%	1.6%	0.0%	0.0%	0.0%	0.0%
	6585	737800	Boeing 737-800 Series, Boeing Business Jet II, Boeing 737-900 Series, Boeing 737-900-ER, Boeing 737-800 Short Field Package-Next Gen, MC-21-300, Boeing Business Jet (BBJ), SMR100, BOEING 737-800 Poseidon, Boeing 737-800BCF	7.6%	4.7%	6.9%	19.2%	7.3%	6.1%	5.8%	19.2%	0.0%	0.0%	0.0%	0.0%
	3071	EMB175	Embraer ERJ175-LR, Embraer ERJ175, Mitsubishi Spacejet M90	15.2%	6.1%	4.3%	25.6%	14.8%	4.5%	6.3%	25.6%	0.0%	0.0%	0.0%	0.0%
	3918	757RR	Tupolev 204, Boeing 757-200 Series, Boeing 757-200 Series Freighter, Tupolev 204 Freighter, Tupolev 214, Tupolev 204 SM, United Aircraft Corporation (Irkut) MC-21 -300	1.9%	0.0%	0.2%	2.2%	1.6%	0.0%	0.5%	2.2%	0.0%	0.0%	0.0%	0.0%
	5969	A310-304	Airbus A310-200 Series, Airbus A310-300 Series, Airbus A310-200 Series Freighter	0.7%	0.0%	0.1%	0.9%	0.5%	0.0%	0.4%	0.9%	0.0%	0.0%	0.0%	0.0%
	4087	7673ER	Boeing 767-300 ER, Boeing 767-300 ER Freighter	1.2%	0.0%	0.7%	1.9%	1.0%	0.0%	0.9%	1.9%	0.0%	0.0%	0.0%	0.0%
	6413	7378MAX	Boeing 737-8, Boeing 737-9	0.6%	0.2%	0.0%	0.8%	0.4%	0.4%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%
	2454	A320-211	Airbus A320-200 Series, Airbus A320-100 Series, COMAC C919	2.6%	1.3%	0.9%	4.9%	1.7%	1.6%	1.6%	4.9%	0.0%	0.0%	0.0%	0.0%
	6637	A320-271N	Airbus A320-NEO	0.1%	0.0%	2.5%	2.7%	0.1%	0.0%	2.5%	2.7%	0.0%	0.0%	0.0%	0.0%
	957	A319-131	Airbus A318-100 Series, Airbus A319-100 Series, Airbus A319-100 X/LR, Airbus A319CJ, Airbus A319-NEO	2.7%	1.7%	2.8%	7.1%	3.4%	2.0%	1.8%	7.1%	0.0%	0.0%	0.0%	0.0%
	1705	DHC830	Convair CV-580, ATR 42-400, ATR 42-500, ATR 72-200, Bombardier de Havilland Dash 8 Q400, DeHavilland DHC-8-200, DeHavilland DHC-8-300, Bombardier de Havilland Dash 8 Q300, Bombardier de Havilland Dash 8 Q200, Ilyushin 114, Antonov 140, Ilyushin 114-300, Antonov 70, Canada Air CL-215, ATR 72-600, ATR 42-600, ATR 72-600 Freighter, CAIC China Aviation Industry Corp MA-60, CAIC China Aviation Industry Corp MA-600	0.0%	0.5%	0.0%	0.5%	0.0%	0.5%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%
	2587	A320-232	Airbus A320-200 Series	0.6%	1.7%	6.2%	8.5%	0.7%	1.3%	6.4%	8.4%	0.0%	0.0%	0.0%	0.0%
	2546	CRJ9-ER	Bombardier CRJ-700, Bombardier CRJ-700-ER, Bombardier CRJ-200-ER, Bombardier CRJ-100-LR, Bombardier CRJ-900-ER, Bombardier CRJ-900, Bombardier CRJ-100, Bombardier CRJ-1000	6.2%	3.0%	3.7%	12.9%	7.9%	1.5%	3.5%	12.9%	0.0%	0.0%	0.0%	0.0%
	Total			47.1%	21.0%	31.9%	100.0%	45.6%	20.3%	34.1%	100.0%	0.0%	0.0%	0.0%	0.0%
General Aviation	3160	B407	Bell 407 / Rolls-Royce 250-C47B	2.9%	0.3%	0.4%	3.6%	2.7%	0.4%	0.5%	3.6%	0.0%	0.0%	0.0%	0.0%
	2391	CL600	Bombardier Challenger 600, Bombardier Challenger 300, Fokker (VFW) 614, Bombardier CRJ-100, Bombardier CRJ-200, Bombardier Challenger 604, Gulfstream G200, Bombardier CRJ-400, Bombardier CRJ-200-LR, Bombardier CRJ-200-ER, Bombardier CRJ-400-LR, Bombardier Challenger 605, Bombardier Challenger 850, Bombardier Challenger 601, Bombardier Challenger 350, Bombardier Challenger 650, Bombardier (Canadair) Challenger 800, Bombardier (Canadair) CRJ100PF Bulk Freighter, Bombardier (Canadair) CRJ200PF Bulk Freighter	1.3%	0.4%	0.1%	1.7%	1.1%	0.5%	0.1%	1.7%	0.0%	0.0%	0.0%	0.0%
	1196	BEC58P	Cessna 421 Piston, Britten-Norman BN-2 Islander, Britten-Norman BN-2A Series Mk III Trislander, Piper PA-31 Navajo, Rockwell Twin Commander 700, Cessna 337 Skymaster, Aerostar PA-60, Piper PA-23 Apache/Aztec, Piper PA-27 Aztec, Raytheon Beech Baron 58, Raytheon Beech 60 Duke, Cessna 310, Rockwell Twin Commander 500, Piper PA-34 Seneca, Rockwell Twin Commander 680, Cessna 340, Cessna 402, Cessna 404 Titan II, Cessna 414, Raytheon Beech 55 Baron, Beech 75 (FAS), Beech 95 (FAS), Beech E-55 (FAS), Beechcraft 56TC Baron (FAS), Beechcraft 76 Duchess, Beechcraft Queen Air 65/70/80 (FAS), Beechcraft Twin Bonanza (FAS), Cessna T303 Crusader (FAS), Cessna 320 (FAS), Cessna 335/340 (FAS), Tecnam P2012 Traveller, Cessna 401 (FAS), Cessna 401A (FAS), Cessna 401B (FAS), Cessna 411 (FAS), Cessna 411A (FAS), Beechcraft A56TC Baron (FAS), Rockwell Twin Commander 685, Rockwell Twin Commander 520, Rockwell Twin Commander 560	3.5%	1.1%	0.2%	4.8%	3.7%	1.0%	0.2%	4.9%	5.5%	0.0%	0.0%	5.5%
	4889	CNA441	Cessna 441 Conquest II, Piper PA-31T Cheyenne, Cessna 425 Conquest I, COMMANDER980/1000, Piaggio Aerospace P.180 Avanti, Cessna 421 Turboprop	0.8%	0.3%	0.0%	1.1%	0.9%	0.2%	0.0%	1.1%	1.2%	0.0%	0.0%	1.2%
	1262	CNA182	Cessna 182, Cessna Aircraft Company 180F, Cessna 182 R (FAS), Cessna 185 Skywagon	1.7%	0.8%	0.1%	2.6%	1.8%	0.9%	0.0%	2.7%	3.9%	0.0%	0.0%	3.9%
	6104	CNA510	Honda HA-420 Hondajet, CESSNA CITATION 510, Embraer Phenom 100 (EMB-500), EPIC Victory, Cirrus Vision SF50 (FAS), Embraer Legacy 450 (EMB-545)	0.7%	0.1%	0.0%	0.8%	0.6%	0.1%	0.2%	0.8%	0.0%	0.0%	0.0%	0.0%
	6070	CNA560XL	Cessna 560 Citation Excel, Cessna 560 Citation XLS	0.7%	0.3%	0.1%	1.1%	0.7%	0.2%	0.2%	1.1%	0.0%	0.0%	0.0%	0.0%
	6067	CNA525C	Cessna CitationJet CJ3 (Cessna 525B), Cessna CitationJet CJ4 (Cessna 525C), Cessna CitationJet CJ2 (Cessna 525A), Cessna CitationJet CJ/CJ1 (Cessna 525)	1.6%	0.7%	0.1%	2.3%	1.5%	0.5%	0.3%	2.3%	0.0%	0.0%	0.0%	0.0%
	3044	CNA55B	Cessna 550 Citation II, Cessna S550 Citation S/II, Cessna 551 Citation IISP, Cessna 552 T-47A, Raytheon Premier I, Aerospatiale SN 601 Corvette, Cessna 550 Citation Bravo, Embraer Phenom 300 (EMB-505), Embraer Legacy 650, Pilatus PC-24, Embraer Legacy 500 (EMB-550)	1.8%	0.6%	0.2%	2.6%	1.7%	0.6%	0.3%	2.6%	0.0%	0.0%	0.0%	0.0%
	6386	CNA680	Cessna 680 Citation Sovereign, Cessna Citation Hemisphere, Cessna 680-A Citation Latitude, Cessna 700 Citation Longitude	0.7%	0.2%	0.1%	1.0%	0.5%	0.3%	0.2%	1.0%	0.0%	0.0%	0.0%	0.0%

FAA Tower Category	AEDT Equipment ID	AEDT ANP Type	Representative Aircraft	Departures				Arrivals				Local			
				Day	Evening	Night	Total	Day	Evening	Night	Total	Day	Evening	Night	Total
	1265	CNA172	Lancair 360, Aviat Husky A1B, Cessna 172 Skyhawk, Raytheon Beech D17S Staggerwing, Rans S7S, American Champion Cibrata (FAS), American Champion Scout (FAS), Cessna 170 (FAS), Cessna 175 (FAS), Cessna 177 (FAS), Piper PA-22-150 (FAS), Piper Pacer (FAS)	3.9%	1.6%	0.2%	5.7%	3.8%	1.5%	0.1%	5.5%	6.6%	0.0%	0.0%	6.6%
	6281	COMSEP	Cirrus SR20, 1985 1-ENG COMP, Cirrus SR22 Turbo (FAS), Cirrus SR22 (FAS)	7.4%	2.4%	1.0%	10.9%	7.8%	2.6%	0.4%	10.8%	12.3%	0.0%	0.0%	12.3%
	3172	CNA206	Cessna 206, Comp Air Aviation Comp Air 10, Comp Air Aviation Comp Air 10 XLT	0.6%	0.3%	0.0%	0.9%	0.6%	0.3%	0.0%	1.0%	1.7%	0.0%	0.0%	1.7%
	1489	CNA208	Pilatus PC-6 Porter, Piper PA46-TP Meridian, Pilatus PC-12, EADS Socata TBM-700, Cessna 208 Caravan, SOCATA TBM 850, DeHavilland DHC-3 Turbo Otter, EPIC LT/Dynasty, Extra EA-500, Quest Kodiak 100, Myasishchev M-101T, Pacific Aerospace P-750 XSTOL, DAHER TBM 900/930, DeHavilland DHC-2 Turbo Beaver, EMBRAER EMB-314 (FAS), Beechcraft T-6 Texan 2 (FAS), Socata TBM-9 (FAS), SCF Technoavia SM-92T	8.0%	2.0%	0.8%	10.7%	7.6%	2.4%	0.4%	10.5%	18.5%	0.0%	0.0%	18.5%
	1276	GASEPV	Maule MT-7-235, Ryan Navion B, Ryan Navion F, Piper PA-32 Cherokee Six, Boeing Stearman PT-17 / A75N1, Ryan ST3KR, Raytheon Beech Bonanza 36, Cessna 210 Centurion, ATI AT-802, ATI AT-502, ATI AT-502A, ATI AT-602, Helio U-10 Super Courier, Ayres S2R-T34 Turbo-Thrush, ATI AT-502B, Mooney M20-K, EADS Socata TB-10 Tobago, Spencer S-12 Air Car, Piper PA-24 Comanche, EADS Socata TB-20 Trinidad, DeHavilland DHC-2 Beaver, DeHavilland DHC-3 Otter, Piper PA46 (Piston), Beechcraft Bonanza 33 (FAS), Beechcraft Bonanza 35 (FAS), Beechcraft T-34 Mentor (FAS), Bellanca 8 Scout Super Decathlon (FAS), Bellanca Viking (FAS), Cessna 177 Cardinal RG (FAS), Cessna 180 (FAS), Cessna 190 (FAS), Cessna 195 (FAS), Cessna 205 (FAS), Cessna 207 (Turbo) Stationair (FAS), Cessna 210 Turbo (FAS), Cessna 400 (FAS), Columbia Aircraft Lancair (COL3/4 All Types) (FAS), Commander 114/115 (FAS), Diamond DA40, EAGLE DW-1 Eagle (FAS), Express 2000 (FAS), EXTRA EA-300 (FAS), GippsAero GA8 Airvan (FAS), Glasair (FAS), Lancair ES (FAS), Lancair Evolution (FAS), Lancair Legacy 2000 (FAS), Meyers Aero Commander 200 (FAS), Model 35 Bonanza (FAS), North American T-6 Texan (FAS), Piper PA-36 Pawnee Brave (FAS), Piper PA46 Malibu (FAS), Pitts Special S-1 (FAS), Vans RV10 (FAS), Vans RV6 (FAS), Vans RV-7, Vans RV8 (FAS), Vans RV9 (FAS), Zlin Aircraft Z 143 L	7.3%	2.8%	0.4%	10.5%	7.1%	3.2%	0.2%	10.6%	12.3%	0.0%	0.0%	12.3%
	1483	DHC6	BAE Jetstream 31, BAE Jetstream 32, BAE Jetstream 32-EP, Austrailia GAF N22/24 Nomad, SIAI-Marchetti SF-600 Canguro, CASA 212-200 Series, Raytheon Beech 18, Bombardier CL-415, Fairchild SA-227-AC Metro III, Xian Yunshuji Y-7, Embraer 312 Tucano, Grumman C-1 Trader, Fairchild Metro IVC, Embraer EMB110 Bandeirante, Israel IAI-201 Arava, Israel IAI-101 Arava, Neiva NE-821 Caraja, Harbin Y-12, Raytheon King Air 100, Raytheon King Air 90, Raytheon Beech 99, CASA 212-100 Series, Dornier 228-100 Series, Raytheon Super King Air 200, American Jet Hustler 400 A, DeHavilland DHC-6-300 Twin Otter, Reims-Cessna 406 Caravan II, DeHavilland DHC-6-100 Twin Otter, DeHavilland DHC-6-200 Twin Otter, Equator P-550 Turbo, Raytheon Super King Air 300, Ayres Turbo Thrush T-65, Dornier 128 Skyservant, Piaggio P-166, Raytheon Starship 2000, Rockwell Twin Commander 690, CASA 212-300 Series, Let 410, Let 410-UVP, Let 420 Tubolet, Mitsubishi MU-2, Fairchild SA-226-TC Metro II, Fairchild SA-227-AT Expeditor, Piaggio P.180 Avanti, Fairchild SA-26-T Merlin II, Grumman S-2E Tracker, Grumman G-21G Goose, C-26A, CASA 212-400 Series, Fairchild SA-226-T Merlin III, Shorts Skyvan SC7-3-1, Shorts Skyvan SC7-3-2, Shorts Skyvan SC7-3A-1, Antonov AN28 Cash, PZL M-28 Skytruck, Embraer EMB-121 Xingu, Evektor EV-55, Dornier Seastar CD-1/CD-2, Antonov An-2 MS, Antonov An-2 MS Freighter, Viking Air DHC-6-400 Guardian, CAIC China Aviation Industry Corp MA-60, CAIC China Aviation Industry Corp MA-600, SHERPA Sherpa K-650T, Grumman G-73 Mallard, Aero Commander 680 Turbo Commander, Gulfstream Gulfstream S-2T Marsh Airtanker	16.5%	4.3%	1.5%	22.3%	15.7%	5.5%	1.1%	22.4%	28.6%	0.0%	0.0%	28.6%
	3810	SA350D	Aerospatiale SA-350D Astar (AS-350), PZL Swidnik SW-4	1.0%	0.1%	0.1%	1.2%	0.9%	0.2%	0.2%	1.2%	0.0%	0.0%	0.0%	0.0%
	6108	ECLIPSE500	Eclipse 500 / PW610F, Hawker Beechcraft Corp Beechjet 400A, SJ-30-1/-2/-2+, CIRRUS SF-50 Vision	0.3%	0.1%	0.0%	0.5%	0.3%	0.1%	0.1%	0.5%	0.0%	0.0%	0.0%	0.0%
	6288	PA30	Vulcanair P.68, Piper PA-30 Twin Comanche, Diamond DA42 Twin Star, Diamond DA62, Piper PA44 (FAS), Piper PA-44-180 (FAS), Tecnam P2006T (FAS), Piper PA-44-180T (FAS)	1.2%	0.3%	0.2%	1.7%	1.2%	0.4%	0.1%	1.7%	2.0%	0.0%	0.0%	2.0%
	22	S76	Sikorsky S-76 Spirit, Sikorsky S-76C	0.3%	0.0%	0.0%	0.4%	0.3%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%
	2102	GASEPF	Robin DR 400, Robin R 2160 Alpha Sport, Robin R 3000, EADS Socata TB-9 Tampico, Cessna 150 Series, Piper PA-28 Cherokee Series, Aero Commander (Single engine) (FAS), Aeronca 15 Sedan (FAS), Beech 23 Musketeer Sundowner (FAS), Beech 24 Musketeer Super Sierra (FAS), Beech 77 Skipper (FAS), Beechcraft Musketeer Model 19 (FAS), Cessna 140 (FAS), Cessna 152 (FAS), Cessna 162 (FAS), Cozy (FAS), Diamond DV-20 Katana (FAS), Diamond HK36 Super Dimona (FAS), GC1 Globe Swift (FAS), Grob G115A/B/C/D/E Bavarian (FAS), Grumman AA-5A/B (FAS), Gulfstream American GA-7 Cougar (FAS), Lancair 320 (FAS), Piper J-3 Cub (FAS), Piper PA-18-150 (FAS), Piper PA-38 Tomahawk (FAS), Sequoia Falco (FAS), Stinson (FAS), Vans RV12 (FAS), Vans RV3 (FAS), Vans RV4 (FAS), Velocity (FAS), Zenair CH-100/150/250 (FAS)	4.5%	1.8%	0.3%	6.6%	4.4%	1.8%	0.6%	6.8%	7.4%	0.0%	0.0%	7.4%

FAA Tower Category	AEDT Equipment ID	AEDT ANP Type	Representative Aircraft	Departures				Arrivals				Local			
				Day	Evening	Night	Total	Day	Evening	Night	Total	Day	Evening	Night	Total
	1976	IA1125	Israel IAI-1121 Commodore, Israel IAI-1123, Israel IAI-1124 Westwind I, Israel IAI-1124-A Westwind II, Israel IAI-1125 Astra, Gulfstream G100, Gulfstream G150, Israel IAI-1126 Galaxy, Rockwell 1121 Jet Commander, Rockwell 1121A Jet Commander-A, Rockwell 1121B Jet Commander-B	0.4%	0.1%	0.1%	0.6%	0.4%	0.1%	0.1%	0.6%	0.0%	0.0%	0.0%	0.0%
	2032	LEAR35	Rockwell Sabreliner 65, Lockheed L-1329 Jetstar I, Lockheed L-1329 Jetstar II, Hawker HS-125 Series 1, Raytheon Hawker 1000, Hawker HS-125 Series 3, Hawker HS-125 Series 400, Hawker HS-125 Series 700, Raytheon Hawker 800, Dassault Falcon 100, Dassault Falcon 10, Hawker HS-125 Series 600, Bombardier Learjet 55, Bombardier Learjet 60, Bombardier Learjet 31, Bombardier Learjet 35, Bombardier Learjet 36, Bombardier Learjet 40, Bombardier Learjet 45, Bombardier Learjet 45-XR, Raytheon Hawker 900, Raytheon Hawker C-29A, Bombardier Learjet 35A/36A (C-21A), Hawker 900XP, Bombardier Learjet 70, Bombardier Learjet 75	0.7%	0.2%	0.1%	0.9%	0.5%	0.2%	0.2%	0.9%	0.0%	0.0%	0.0%	0.0%
	20	S70	Sikorsky SH-60 Sea Hawk, Sikorsky UH-60 Black Hawk, Sikorsky S-92	5.5%	0.0%	0.0%	5.5%	5.5%	0.0%	0.0%	5.5%	0.0%	0.0%	0.0%	0.0%
	Total			73.3%	21.0%	5.7%	100.0%	71.5%	22.8%	5.6%	100.0%	100.0 %	0.0%	0.0%	100.0 %
	3160	B407	Bell 407 / Rolls-Royce 250-C47B	3.4%	0.7%	0.7%	4.7%	3.1%	0.7%	0.8%	4.7%	0.0%	0.0%	0.0%	0.0%
	3172	CNA206	Cessna 206, Comp Air Aviation Comp Air 10, Comp Air Aviation Comp Air 10 XLT	0.7%	0.2%	0.0%	0.9%	0.8%	0.1%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%
	2391	CL600	Bombardier Challenger 600, Bombardier Challenger 300, Fokker (VFW) 614, Bombardier CRJ-100, Bombardier CRJ-200, Bombardier Challenger 604, Gulfstream G200, Bombardier CRJ-400, Bombardier CRJ-200-LR, Bombardier CRJ-200-ER, Bombardier CRJ-400-LR, Bombardier Challenger 605, Bombardier Challenger 850, Bombardier Challenger 601, Bombardier Challenger 350, Bombardier Challenger 650, Bombardier (Canadair) Challenger 800, Bombardier (Canadair) CRJ100PF Bulk Freighter, Bombardier (Canadair) CRJ200PF Bulk Freighter	30.3%	7.9%	16.1%	54.4%	32.3%	5.8%	16.2%	54.3%	0.0%	0.0%	0.0%	0.0%
	6386	CNA680	Cessna 680 Citation Sovereign, Cessna Citation Hemisphere, Cessna 680-A Citation Latitude, Cessna 700 Citation Longitude	0.9%	0.4%	0.0%	1.3%	0.8%	0.4%	0.2%	1.3%	0.0%	0.0%	0.0%	0.0%
	1489	CNA208	Pilatus PC-6 Porter, Piper PA46-TP Meridian, Pilatus PC-12, EADS Socata TBM-700, Cessna 208 Caravan, SOCATA TBM 850, DeHavilland DHC-3 Turbo Otter, EPIC LT/Dynasty, Extra EA-500, Quest Kodiak 100, Myasishchev M-101T, Pacific Aerospace P-750 XSTOL, DAHER TBM 900/930, DeHavilland DHC-2 Turbo Beaver, EMBRAER EMB-314 (FAS), Beechcraft T-6 Texan 2 (FAS), Socata TBM-9 (FAS), SCF Technoavia SM-92T	12.0%	2.3%	0.9%	15.3%	13.2%	1.5%	0.6%	15.3%	0.0%	0.0%	0.0%	0.0%
	6067	CNA525C	Cessna CitationJet CJ3 (Cessna 525B), Cessna CitationJet CJ4 (Cessna 525C), Cessna CitationJet CJ2 (Cessna 525A), Cessna CitationJet CJ/CJ1 (Cessna 525)	0.4%	0.2%	0.1%	0.8%	0.4%	0.2%	0.2%	0.8%	0.0%	0.0%	0.0%	0.0%
	1262	CNA182	Cessna 182, Cessna Aircraft Company 180F, Cessna 182 R (FAS), Cessna 185 Skywagon	1.5%	0.6%	0.2%	2.2%	1.9%	0.3%	0.0%	2.2%	0.0%	0.0%	0.0%	0.0%
	3044	CNA55B	Cessna 550 Citation II, Cessna S550 Citation S/II, Cessna 551 Citation IISP, Cessna 552 T-47A, Raytheon Premier I, Aerospatiale SN 601 Corvette, Cessna 550 Citation Bravo, Embraer Phenom 300 (EMB-505), Embraer Legacy 650, Pilatus PC-24, Embraer Legacy 500 (EMB-550)	2.4%	0.5%	0.2%	3.2%	1.9%	0.9%	0.4%	3.2%	0.0%	0.0%	0.0%	0.0%
	6070	CNA560XL	Cessna 560 Citation Excel, Cessna 560 Citation XLS	0.5%	0.2%	0.1%	0.7%	0.5%	0.2%	0.1%	0.7%	0.0%	0.0%	0.0%	0.0%
	1309	CNA750	Cessna 750 Citation X, Dornier 328 Jet, Raytheon Hawker 4000 Horizon, Bombardier Learjet 60, CX 750 Citation X+, Dassault Falcon 2000-EX, Dassault Falcon 2000, Dassault Falcon 2000-LX, Embraer Praetor 500, Dassault Falcon 2000-DX	0.4%	0.2%	0.0%	0.7%	0.5%	0.1%	0.1%	0.7%	0.0%	0.0%	0.0%	0.0%
	1276	GASEPV	Maule MT-7-235, Ryan Navion B, Ryan Navion F, Piper PA-32 Cherokee Six, Boeing Stearman PT-17 / A75N1, Ryan ST3KR, Raytheon Beech Bonanza 36, Cessna 210 Centurion, ATI AT-802, ATI AT-502, ATI AT-502A, ATI AT-602, Helio U-10 Super Courier, Ayres S2R-T34 Turbo-Thrush, ATI AT-502B, Mooney M20-K, EADS Socata TB-10 Tobago, Spencer S-12 Air Car, Piper PA-24 Comanche, EADS Socata TB-20 Trinidad, DeHavilland DHC-2 Beaver, DeHavilland DHC-3 Otter, Piper PA46 (Piston), Beechcraft Bonanza 33 (FAS), Beechcraft Bonanza 35 (FAS), Beechcraft T-34 Mentor (FAS), Bellanca 8 Scout Super Decathlon (FAS), Bellanca Viking (FAS), Cessna 177 Cardinal RG (FAS), Cessna 180 (FAS), Cessna 190 (FAS), Cessna 195 (FAS), Cessna 205 (FAS), Cessna 207 (Turbo) Stationair (FAS), Cessna 210 Turbo (FAS), Cessna 400 (FAS), Columbia Aircraft Lancair (COL3/4 All Types) (FAS), Commander 114/115 (FAS), Diamond DA40, EAGLE DW-1 Eagle (FAS), Express 2000 (FAS), EXTRA EA-300 (FAS), GippsAero GA8 Airvan (FAS), Glasair (FAS), Lancair ES (FAS), Lancair Evolution (FAS), Lancair Legacy 2000 (FAS), Meyers Aero Commander 200 (FAS), Model 35 Bonanza (FAS), North American T-6 Texan (FAS), Piper PA-36 Pawnee Brave (FAS), Piper PA46 Malibu (FAS), Pitts Special S-1 (FAS), Vans RV10 (FAS), Vans RV6 (FAS), Vans RV-7, Vans RV8 (FAS), Vans RV9 (FAS), Zlin Aircraft Z 143 L	0.3%	0.2%	0.0%	0.5%	0.5%	0.1%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%
	1483	DHC6	BAE Jetstream 31, BAE Jetstream 32, BAE Jetstream 32-EP, Austrailia GAF N22/24 Nomad, SIAI-Marchetti SF-600 Canguro, CASA 212-200 Series, Raytheon Beech 18, Bombardier CL-415, Fairchild SA-227-AC Metro III, Xian Yunshuji Y-7, Embraer 312 Tucano, Grumman C-1 Trader, Fairchild Metro IVC, Embraer EMB110 Bandeirante, Israel IAI-201 Arava, Israel IAI-101 Arava, Neiva NE-821 Caraja, Harbin Y-12, Raytheon King Air 100, Raytheon King Air 90, Raytheon Beech 99, CASA 212-100 Series, Dornier 228-100 Series, Raytheon Super King Air 200, American Jet Hustler 400 A, DeHavilland DHC-6-300 Twin Otter,	4.2%	1.4%	0.8%	6.3%	4.2%	1.6%	0.5%	6.3%	0.0%	0.0%	0.0%	0.0%

FAA Tower Category	AEDT Equipment ID	AEDT ANP Type	Representative Aircraft	Departures				Arrivals				Local			
				Day	Evening	Night	Total	Day	Evening	Night	Total	Day	Evening	Night	Total
			Reims-Cessna 406 Caravan II, DeHavilland DHC-6-100 Twin Otter, DeHavilland DHC-6-200 Twin Otter, Equator P-550 Turbo, Raytheon Super King Air 300, Ayres Turbo Thrush T-65, Dornier 128 Skyservant, Piaggio P-166, Raytheon Starship 2000, Rockwell Twin Commander 690, CASA 212-300 Series, Let 410, Let 410-UVP, Let 420 Tubolet, Mitsubishi MU-2, Fairchild SA-226-TC Metro II, Fairchild SA-227-AT Expeditor, Piaggio P.180 Avanti, Fairchild SA-26-T Merlin II, Grumman S-2E Tracker, Grumman G-21G Goose, C-26A, CASA 212-400 Series, Fairchild SA-226-T Merlin III, Shorts Skyvan SC7-3-1, Shorts Skyvan SC7-3-2, Shorts Skyvan SC7-3A-1, Antonov AN28 Cash, PZL M-28 Skytruck, Embraer EMB-121 Xingu, Evektor EV-55, Dornier Seastar CD-1/CD-2, Antonov An-2 MS, Antonov An-2 MS Freighter, Viking Air DHC-6-400 Guardian, CAIC China Aviation Industry Corp MA-60, CAIC China Aviation Industry Corp MA-600, SHERPA Sherpa K-650T, Grumman G-73 Mallard, Aero Commander 680 Turbo Commander, Gulfstream Gulfstream S-2T Marsh Airtanker												
	1298	CNA560U	Cessna 560 Citation V, Cessna 560 Citation Ultra	0.7%	0.0%	0.4%	1.2%	0.6%	0.1%	0.4%	1.2%	0.0%	0.0%	0.0%	0.0%
	6108	ECLIPSE500	Eclipse 500 / PW610F, Hawker Beechcraft Corp Beechjet 400A, SJ-30-1/-2/-2+, CIRRUS SF-50 Vision	0.6%	0.1%	0.0%	0.7%	0.6%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%
	6466	GV	Gulfstream G-5 Gulfstream 5 / G-5SP Gulfstream G500, Gulfstream G550, Gulfstream V-SP, Gulfstream Aerospace Gulfstream G500 (G-7), Gulfstream G600	1.1%	0.4%	0.1%	1.6%	1.0%	0.4%	0.2%	1.6%	0.0%	0.0%	0.0%	0.0%
	1754	EMB14L	Embraer ERJ145-LR, Embraer ERJ145-ER, Embraer ERJ145-LU, Embraer ERJ145-EU, Embraer ERJ140-LR, Embraer ERJ145-MP	1.7%	0.0%	0.0%	1.8%	1.8%	0.0%	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%
	1922	GIV	Gulfstream G300, Gulfstream G350, Gulfstream G400, Gulfstream G450, Gulfstream IV-SP, Falcon 7X, Dassault Falcon 8X	0.3%	0.2%	0.0%	0.6%	0.3%	0.2%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%
	2032	LEAR35	Rockwell Sabreliner 65, Lockheed L-1329 Jetstar I, Lockheed L-1329 Jetstar II, Hawker HS-125 Series 1, Raytheon Hawker 1000, Hawker HS-125 Series 3, Hawker HS-125 Series 400, Hawker HS-125 Series 700, Raytheon Hawker 800, Dassault Falcon 100, Dassault Falcon 10, Hawker HS-125 Series 600, Bombardier Learjet 55, Bombardier Learjet 60, Bombardier Learjet 31, Bombardier Learjet 35, Bombardier Learjet 36, Bombardier Learjet 40, Bombardier Learjet 45, Bombardier Learjet 45-XR, Raytheon Hawker 900, Raytheon Hawker C-29A, Bombardier Learjet 35A/36A (C-21A), Hawker 900XP, Bombardier Learjet 70, Bombardier Learjet 75	1.1%	0.5%	0.2%	1.7%	1.1%	0.4%	0.2%	1.7%	0.0%	0.0%	0.0%	0.0%
	22	S76	Sikorsky S-76 Spirit, Sikorsky S-76C	0.9%	0.2%	0.2%	1.4%	0.9%	0.2%	0.2%	1.4%	0.0%	0.0%	0.0%	0.0%
	Total			63.5%	16.3%	20.2%	100.0%	66.6%	13.2%	20.2%	100.0%	0.0%	0.0%	0.0%	0.0%

Note: Prepared by FAA Office of Environment and Energy, Noise Division – November 6, 2023.
FAT Fleet Mix from FAA CY 2022 National Inventory by AEDT Equipment Type and FAA Tower Category.
Legend: AEDT = Aviation Environmental Design Tool; ANP = aircraft noise and performance; CY = calendar year; FAA = Federal Aviation Administration; FAT = Fresno Yosemite International Airport; ID = identification; TAF = Terminal Area Forecast.

Table A-6 TAF Analysis: FAT CY 2022 Stagelength Distribution

AEDT Equipment ID	AEDT ANP Type	Stagelength Distribution																				Total
		1			2			3			4			5			6			7			
		Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	
176	737700	39.5%	9.6%	29.2%	14.7%	6.7%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
4089	757PW	64.5%	0.0%	12.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.5%	0.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
6585	737800	6.7%	1.3%	1.0%	14.9%	3.1%	0.2%	17.8%	20.3%	34.6%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
3071	EMB175	38.7%	21.1%	12.3%	20.8%	2.7%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
3918	757RR	67.7%	0.0%	6.7%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	21.5%	0.4%	3.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
5969	A310-304	18.0%	1.1%	15.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	65.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
4087	7673ER	3.1%	0.0%	31.4%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	61.9%	0.0%	3.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
6413	7378MAX	22.1%	12.8%	0.0%	53.5%	5.8%	0.0%	1.2%	3.5%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
2454	A320-211	49.4%	17.4%	18.6%	4.0%	9.6%	0.0%	0.0%	0.0%	0.2%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
6637	A320-271N	0.0%	0.0%	0.0%	4.0%	0.7%	0.0%	1.1%	0.0%	83.6%	0.0%	0.0%	10.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
957	A319-131	35.2%	7.6%	7.5%	2.3%	15.7%	24.1%	0.0%	0.1%	1.4%	0.0%	0.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1705	DHC830	7.4%	92.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
2587	A320-232	6.1%	7.8%	3.0%	0.7%	11.6%	2.6%	0.7%	0.1%	59.5%	0.0%	0.0%	7.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
2546	CRJ9-ER	47.4%	22.5%	28.9%	0.3%	0.3%	0.1%	0.2%	0.2%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
3160	B407	78.1%	10.5%	11.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
2391	CL600	58.1%	15.5%	26.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1196	BEC58P	72.5%	23.5%	4.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
4889	CNA441	71.4%	27.2%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1262	CNA182	65.4%	31.8%	2.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
6104	CNA510	87.9%	11.5%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
6070	CNA560XL	65.3%	26.8%	7.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
6067	CNA525C	67.3%	28.4%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
3044	CNA55B	71.4%	21.9%	6.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
6386	CNA680	68.8%	24.1%	7.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1265	CNA172	68.7%	28.5%	2.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
6281	COMSEP	68.6%	22.0%	9.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
3172	CNA206	66.5%	30.7%	1.9%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1489	CNA208	75.5%	17.7%	6.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1276	GASEPV	69.0%	26.9%	4.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1483	DHC6	73.6%	19.4%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
3810	SA350D	80.1%	10.1%	9.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
6108	ECLIPSE500	68.4%	22.9%	1.3%	3.4%	1.3%	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
6288	PA30	70.6%	19.6%	9.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
2102	GASEPF	68.9%	26.8%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1976	IA1125	68.2%	23.1%	8.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
2032	LEAR35	71.5%	20.8%	7.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1309	CNA750	69.8%	24.3%	5.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1298	CNA560U	57.8%	14.7%	27.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
6466	GV	69.3%	22.7%	8.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1754	EMB14L	89.5%	4.6%	3.4%	0.0%	0.0%	1.3%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
1922	GIV	69.2%	29.1%	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
20	S70	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
22	S76	76.6%	13.4%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%

Note: Prepared by FAA Office of Environment and Energy, Noise Division – November 6, 2023.
FAT Departure Stage Length Distribution from FAA CY 2022 National Inventory by AEDT Equipment Type.

Legend: AEDT = Aviation Environmental Design Tool; ANP = aircraft noise and performance; CY = calendar year; FAA = Federal Aviation Administration; FAT = Fresno Yosemite International Airport; ID = identification; TAF = Terminal Area Forecast.

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Civil Flight Tracks

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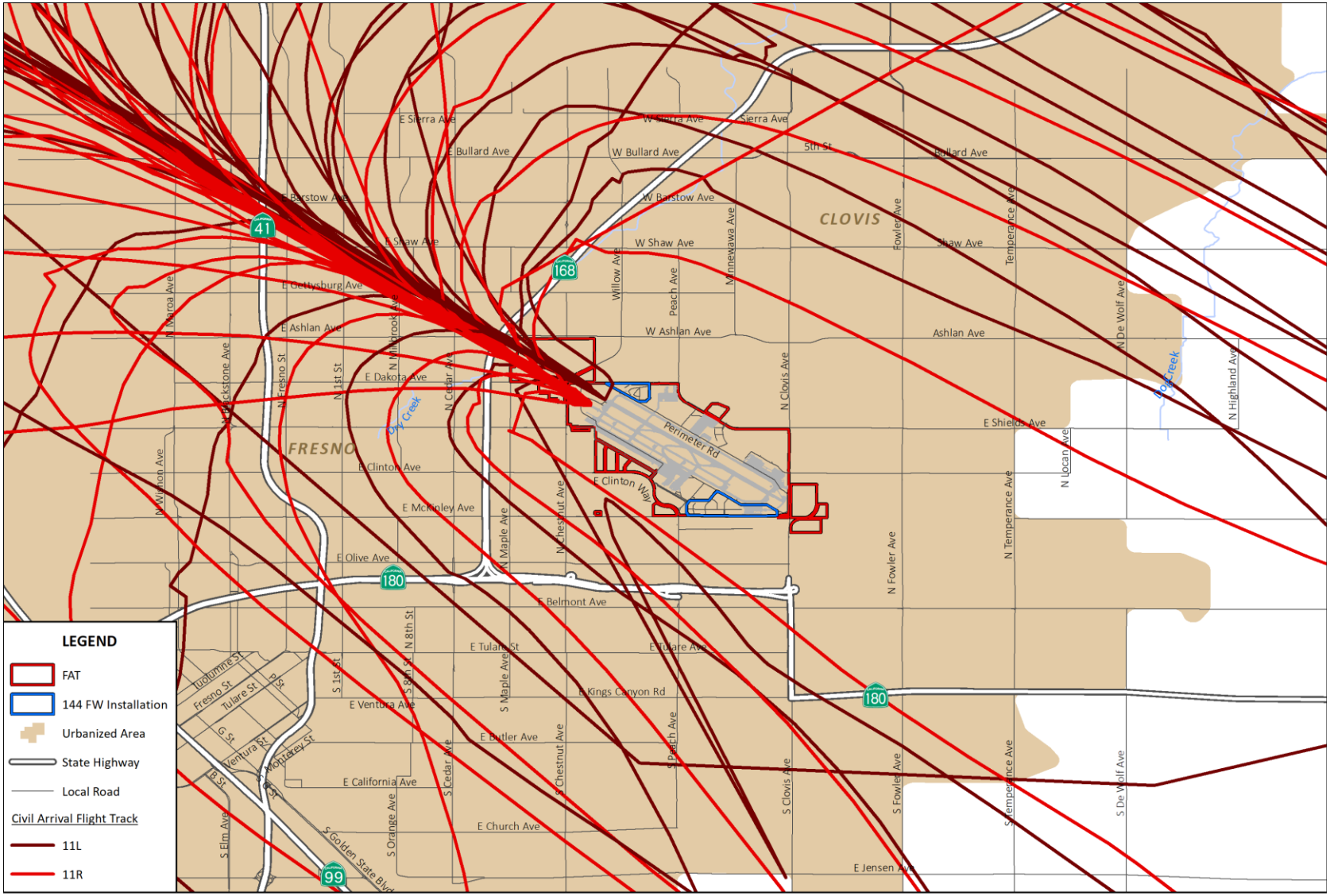
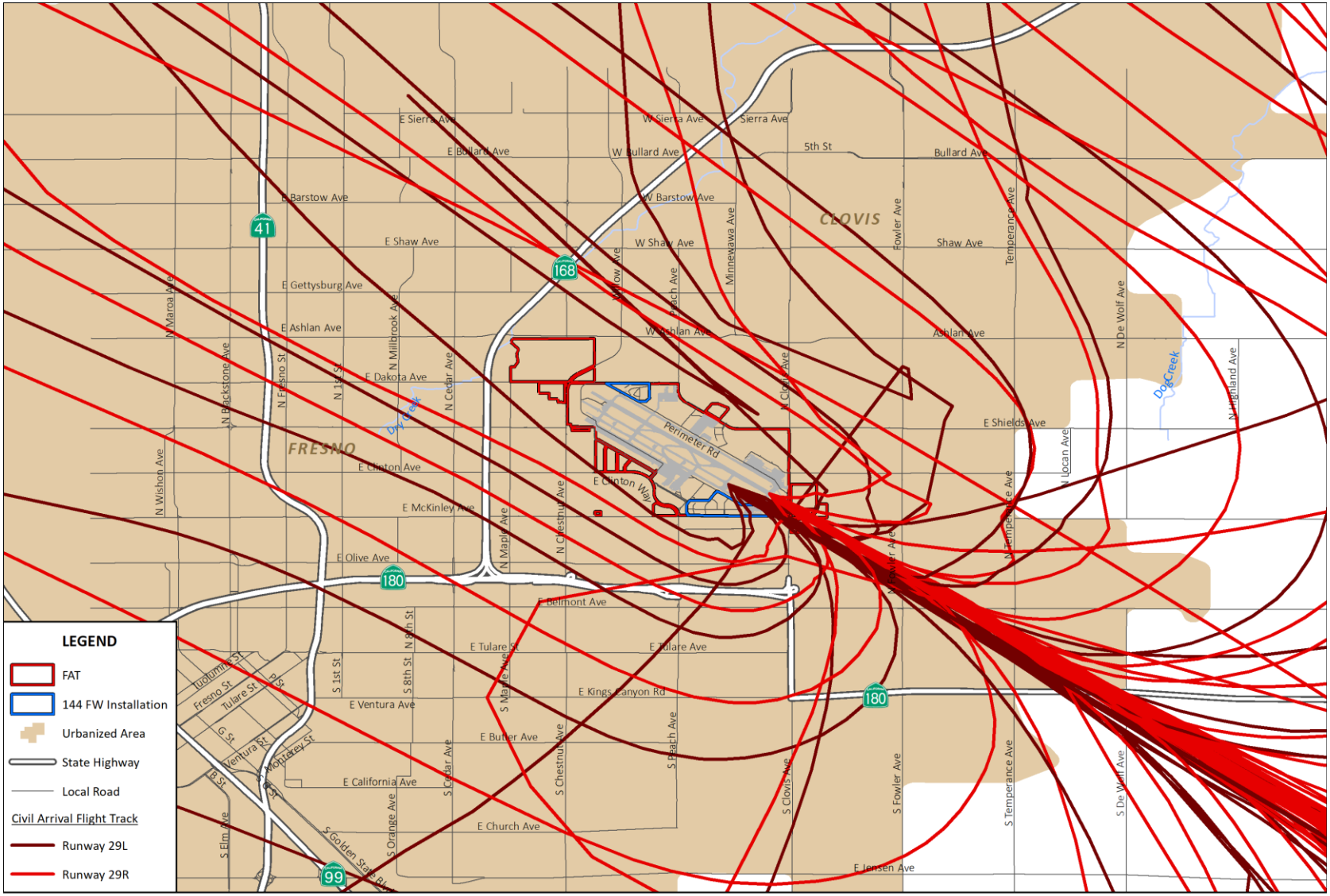
Table A-7 Civil Flight Track Utilization

Op Type	*Rwy*	*Flight Track*	*Usage*
Arrival	11L	A11LER	38.77%
		A11LNER	17.52%
		A11LNWC	32.29%
		A11LNWR	7.24%
		A11LSC	1.07%
		A11LSL	1.83%
		A11LSR	1.29%
	11R	A11RER	12.94%
		A11RNER	4.81%
		A11RNWC	36.08%
		A11RNWL	5.38%
		A11RNWR	6.30%
		A11RSC	2.75%
		A11RSL	31.73%
	29L	A29LEC	3.73%
		A29LEL	2.87%
		A29LNEL	1.59%
		A29LNWL	14.30%
		A29LNWR	26.91%
		A29LSC	17.38%
		A29LSR	33.22%
	29R	A29REC	13.56%
		A29REL	7.98%
		A29RER	0.39%
		A29RNEC	0.60%
		A29RNEL	2.11%
		A29RNWC	5.86%
		A29RNWL	18.25%
		A29RNWR	0.87%
		A29RSC	47.22%
		A29RSR	3.14%
		D11LEL	32.41%
		D11LNEL	13.85%
		D11LNWL	9.70%
		D11LSR	44.04%
		D11REL	17.76%
		D11RNEL	12.48%
		D11RNWL	16.64%
		D11RNWR	8.62%
		D11RSR	44.50%
		D29LER	0.53%
		D29LNER	13.92%
		D29LNWC	13.69%
		D29LNWL	11.03%
		D29LNWR	13.52%
		D29LSL	45.07%
		D29LSR	2.24%
		D29RER	1.38%
		D29RNER	32.00%
		D29RNWC	8.58%

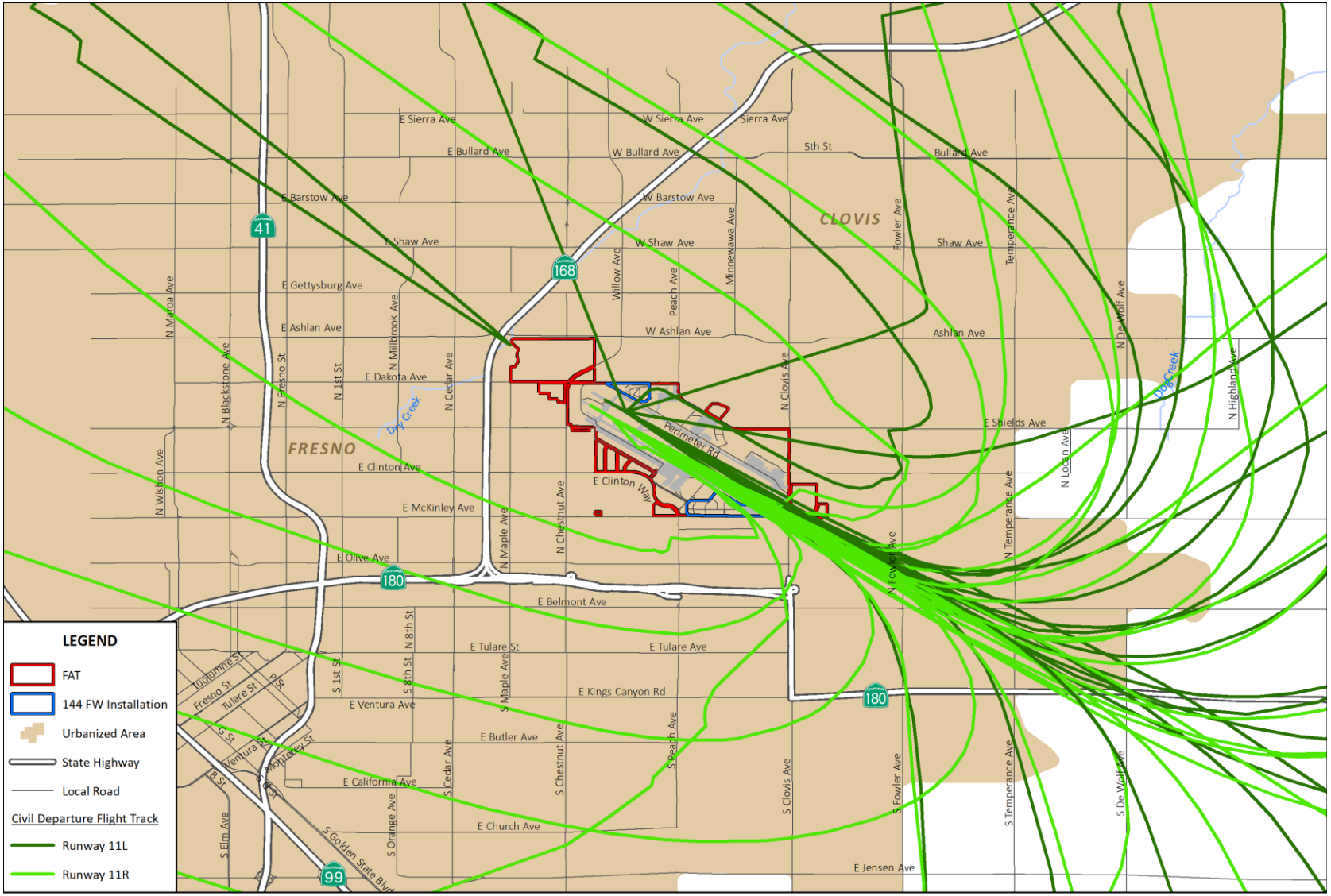
Op Type	*Rwy*	*Flight Track*	*Usage*
		D29RNWL	2.68%
		D29RNWR	11.17%
		D29RSL	41.25%
		D29RSR	2.94%



Civil Arrival Flight Tracks on Runway 11L-R at FAT

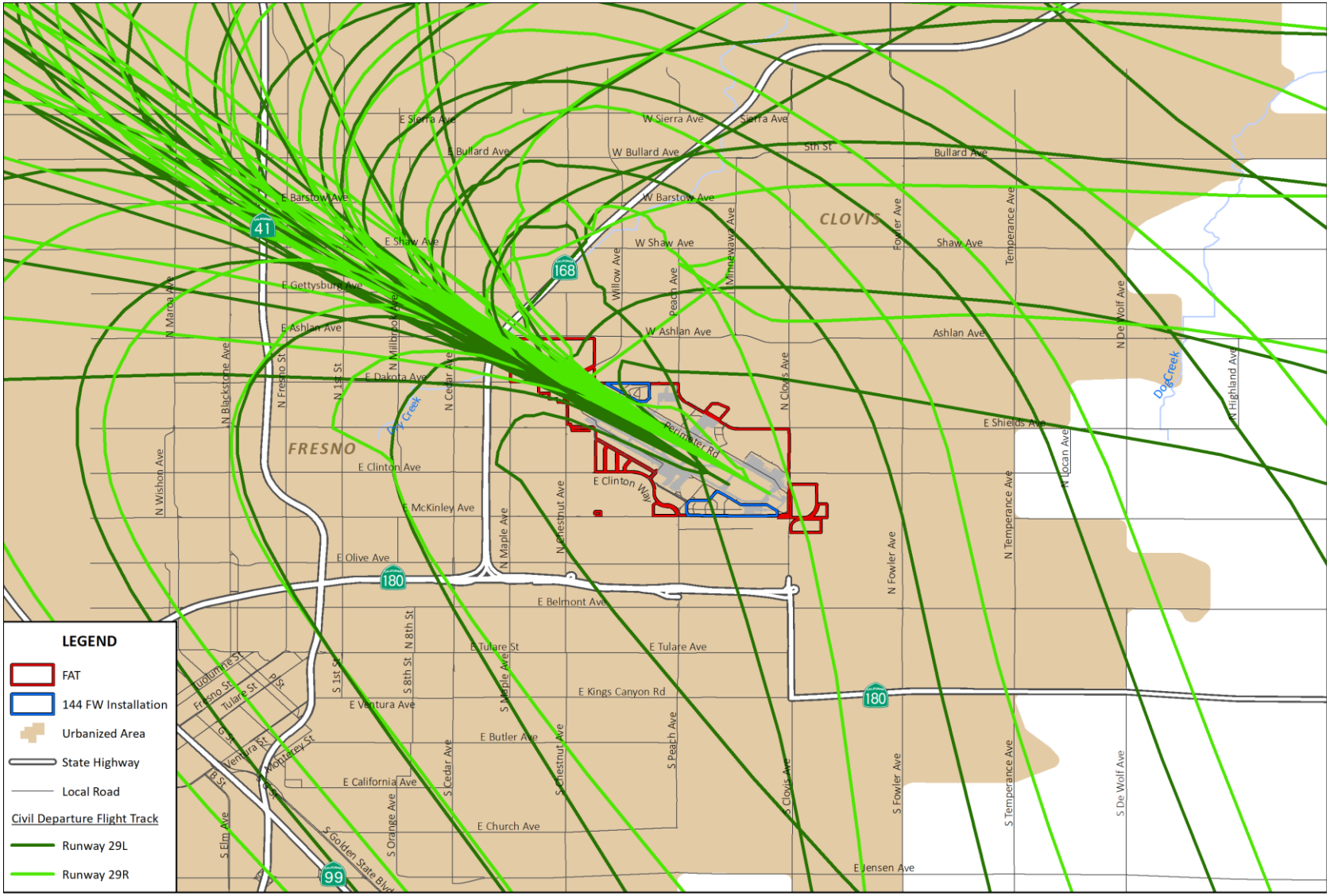


Civil Arrival Flight Tracks on Runway 29L-R at FAT



Civil Departure Flight Tracks on Runway 11L-R at FAT

Source: CA ANG 2022, ESRI 2022


LEGEND
FAT
144 FW Installation
Urbanized Area
State Highway
Local Road
Civil Departure Flight Track
Runway 29L
Runway 29R
FRESNO
CLOVIS
E Sierra Ave
W Sierra Ave
Sierra Ave
E Bullard Ave
W Bullard Ave
Bullard Ave
E Barstow Ave
W Barstow Ave
E Shaw Ave
W Shaw Ave
Shaw Ave
E Gettysburg Ave
E Ashlan Ave
W Ashlan Ave
Ashlan Ave
E Dakota Ave
E Clinton Ave
E Clinton Way
E McKinley Ave
E Olive Ave
E Belmont Ave
E Tulare St
E Tulare Ave
E Kings Canyon Rd
E Ventura Ave
E Butler Ave
E California Ave
E Church Ave
E Jensen Ave
E Shields Ave
Perimeter Rd
N Marty Ave
N Blackstone Ave
N Fresno St
N 1st St
N Millbrook Ave
N Cedar Ave
N Wishon Ave
N Maple Ave
N Chestnut Ave
N 8th St
S 1st St
S 8th St
S Maple Ave
S Cedar Ave
S Chestnut Ave
S Peach Ave
S Clovis Ave
S Fowler Ave
S Temperance Ave
S De Wolf Ave
S Elm Ave
S Orange Ave
S Golden State Blvd
N Willow Ave
N Peach Ave
N Minnewawa Ave
N Clovis Ave
N Fowler Ave
N Temperance Ave
N Locan Ave
N De Wolf Ave
N Highland Ave
Dry Creek
Dog Creek
41
168
180
99
0Kilometers1
0 Miles 1
Civil Departure Flight Tracks on Runway 29L-R at FAT
Source: CA ANG 2022, ESRI 2022