

# **SAN DIEGO**

## **International Airport**

---



AIRPORT MASTER PLAN  
SAN DIEGO INTERNATIONAL AIRPORT

### **SECTION 3.2**

Airfield/Airspace Facilities



## 3.2 Airfield Facilities

The existing conditions of the Airfield and Airspace Facilities are described in detail in this section of the Master Plan document.

There have been two changes to the San Diego International Airport (SDIA) airfield since publication of the 2001 Master Plan:

- A new apron was constructed adjacent to Terminal 2 West in 2002.
- The fillet angles of exit taxiways B5 and B6 were improved to allow for more efficient, higher-speed aircraft exits to Taxiway B after aircraft land on Runway 27.

There have been no changes to the San Diego regional airspace since publication of the 2001 Master Plan. The instrument arrival and departure routes to and from SDIA are unchanged. Previous to the 2001 Master Plan, the only significant shift in air traffic in the San Diego region occurred with the departure of the United States Navy from the Miramar Naval Air Station in 1997. In 1999, the operation of Miramar was transferred to the United States Marines. The air base is now Marine Corps Air Station (MCAS) Miramar. Prior to 1997, approximately 70 percent of Miramar military air traffic was westbound from Miramar over the Pacific Ocean due to the operational characteristics of Naval training flights. Since the end of 1999, the majority of air traffic from Miramar has been eastbound, reflective of the characteristics of Marine flight training activity. The shift in traffic patterns from Miramar has had no discernable impact on commercial operations to and from SDIA.

### 3.2.1 Airfield

Recorded in August 2004, the components of the SDIA airfield are: a single runway, taxiways, aprons, lighting, and navigational aids (NAVAIDs).

#### Runway

The airfield at SDIA features a single east-west air carrier runway designated Runway 9-27, which is illustrated in **Figure 3.2-1**. Runway 9-27 is 9,401 feet long and 200 feet wide with an effective gradient of 0.02 percent. The full length of the runway is paved and constructed of concrete with an asphalt overlay. The following are the pavement strengths for each landing gear configuration:

- Single: 100,000 lbs
- Double: 150,000 lbs
- Double Tandem: 250,000 lbs
- Dual Double Tandem: 720,000 lbs

Displaced thresholds are required at each runway end due to obstructions and non-standard Runway Safety Areas (RSAs). The Runway 9 threshold is displaced 700 feet. The threshold for Runway 27 is displaced 1,810 feet.

#### Taxiways

The taxiway system, illustrated in **Figure 3.2-1**, provides airfield circulation for aircraft and connects Runway 9-27 with the terminal areas, cargo areas, and other airfield facilities. Three primary taxiways serve the airfield: Taxiway B, Taxiway C, and Taxiway D.

Taxiway B is south of, and parallel to, Runway 9-27 and extends the runway's full length with a minimum pavement width of 75 feet. The existing 362.5-foot centerline separation distance between Runway 9-27 and Taxiway B is non-standard. The FAA-recommended separation standard for air carrier runways with

### **3. Inventory of Existing Conditions**

---

Approach Category C & D aircraft operations is 400 feet from runway centerline to parallel taxiway centerline.

Taxiway C is north of and parallel to Runway 9-27. Taxiway C has a minimum pavement width of 75 feet and extends east from Taxiway C4 to the Runway 27 end. Taxiway C provides access to the north ramp area and the Airport's General Aviation (GA) facility. East of Taxiway D, the 362.5-foot centerline separation distance between Runway 9-27 and Taxiway C is non-standard. West of Taxiway D, the Taxiway C centerline is separated from the runway centerline by a distance of 400 feet.

Taxiway D, formerly crosswind Runway 13-31 (decommissioned in 1994), intersects Taxiway C, Runway 9-27, and Taxiway B toward the east end of the airfield and has a minimum pavement width of 75 feet. Taxiway D provides access to the north ramp, the corporate ramp, and the north air cargo ramp.

There are several exit taxiways that connect the runway with the parallel taxiways. To the south of the runway, there are nine taxiways connecting the runway with parallel Taxiway B. To the north of the runway, there are five taxiways connecting the runway with Taxiway C.

There are three acute-angled, high-speed exit taxiways at the west end of the runway connecting the runway to Taxiway B. High-speed exit taxiways allow aircraft to exit the runway more efficiently at a higher rate of speed. This helps reduce Runway Occupancy Time (ROT), which is the amount of time aircraft are on the runway after landing. The high speed exit taxiways are:

- Taxiway B5, located approximately 4,500 feet from the Runway 27 displaced landing threshold.
- Taxiway B6, located approximately 5,600 feet from the Runway 27 displaced landing threshold.
- Taxiway B7, located approximately 6,700 feet from the Runway 27 displaced landing threshold.

#### **Aprons**

The following is a list of the six primary apron areas at SDIA, which are illustrated in **Figure 3.2-2**:

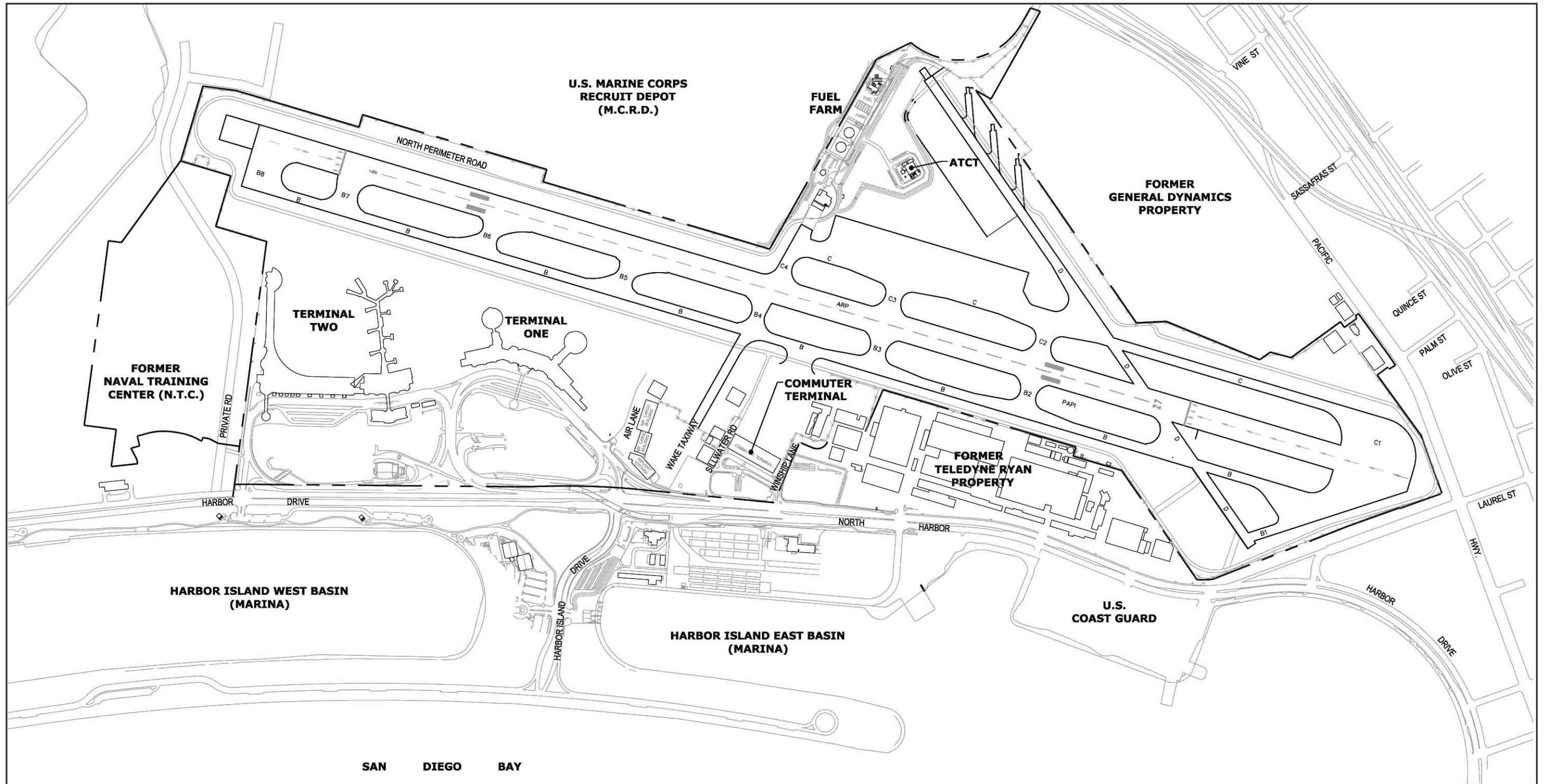
1. The main terminal apron and east ramp area
2. The commuter terminal apron area
3. The north ramp apron area
4. The cargo ramp area
5. The corporate ramp area
6. The general aviation (GA) ramp apron area

The main terminal apron area covers approximately 2.16 million square feet and serves Terminal One, Terminal Two, and Terminal Two West. The east ramp, included in the main terminal apron area, serves a limited number of cargo aircraft east of Terminal One.

The Commuter Terminal is served by a separate apron of approximately 261,000 square feet and has nine commuter aircraft parking positions.

The north ramp apron area of approximately 3.15 million square feet is primarily used as a remote hardstand for aircraft remaining overnight (RON) and can accommodate up to nine Boeing 757s, plus one 747.

The north cargo ramp provides four hardstand positions for large jet aircraft and two additional hardstand positions for smaller jet and propeller aircraft. The total area of the four large hardstand positions is approximately 70,000 square feet. The total area of the North Cargo Ramp is approximately 675,000 square feet and includes an approximately 1,000 foot segment of Taxiway D.



SAN DIEGO BAY

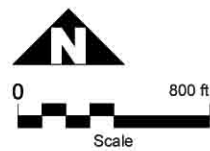
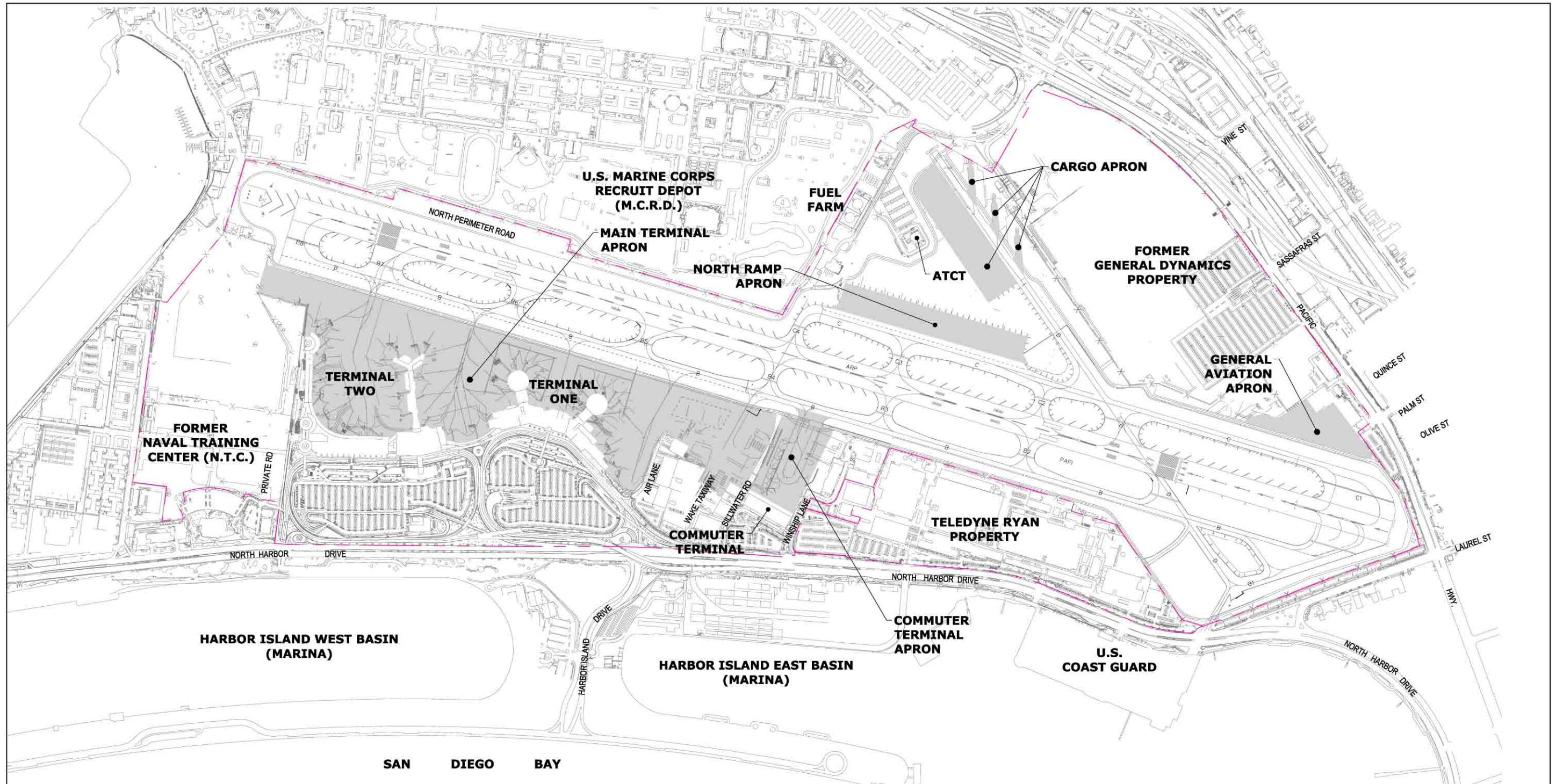


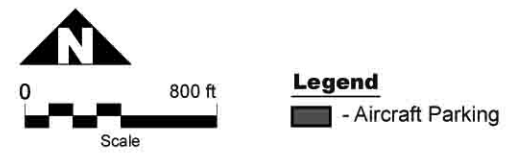
Figure 3.2-1

Existing Airport Layout Plan





**Figure 3.2-2**



**Apron Areas**





### ***3. Inventory of Existing Conditions***

---

The corporate ramp is approximately 315,000 square feet and is used primarily as an overflow parking area for GA aircraft. The aircraft parking capacity of the GA ramp varies according to aircraft size and parking configuration.

The GA ramp is approximately 162,000 square feet and is leased and controlled by the Airport's sole Fixed Base Operator (FBO), Jimsair.

#### **Instrument Approaches**

Runway 9 has one published precision instrument approach procedure and two published non-precision instrument approach procedures:

1. ILS (Instrument Landing System) Runway 9 (Precision Approach)
2. RNAV (Area Navigation) Runway 9 (Non-Precision Approach)
3. NDB (Non-Direction Radio Beacon) Runway 9 (Non-Precision Approach)

Runway 27 has three published non-precision instrument approach procedures:

1. LOC (Localizer) Runway 27 (Non-Precision Approach)
2. RNAV (Area Navigation) Runway 27 (Non-Precision Approach)
3. NDB (Non-Directional Radio Beacon) Runway 27 (Non-Precision Approach)

#### **Navigational Aids (NAVAIDs)**

The following NAVAIDs support the published instrument approaches to SDIA:

- Precision Instrument Runway Markings
- Localizer - Runways 9 and 27
- High Intensity Runway Edge Lights (HIRL)
- Ceilometer
- Runway Centerline Lighting
- Transmissiometer
- Touchdown Zone Lights
- Runway Visual Range (RVR) indicators
- Medium Intensity Approach Light System with Runway Alignment Indicator Lights - (MALSR) Runway 9
- Glideslope - Runway 9
- Medium Intensity Approach Light System (MALS) - Runway 27
- Outer Marker - Runway 9
- Precision Approach Path Indicator (PAPI) – Runway 27
- Middle Marker - Runway 9
- Distance Measuring Equipment (DME) - Runways 9 and 27

VOR (VHF omni-directional range) stations are important en route NAVAIDs. VORs are ground-based NAVAIDs transmitting radio signals 360 degrees in azimuth, allowing pilots to establish and maintain accurate en route air navigation. VOR radio signals enable pilots to turn at a given point above the ground or fly along a radial while tracking the signal. VORs are often combined with Distance Measuring

### **3. Inventory of Existing Conditions**

---

Equipment (DME), enabling pilots to determine their distance from the VOR. These facilities are used in standard arrival and departure procedures.

The following is a list of the four VORs within the Southern California Terminal Radar Approach Control (TRACON) airspace:

- Poggi (PGY)
- Mission Bay (MZB)
- Oceanside (OCN)
- Julian (JLI)

An additional VOR-DME, Tijuana (TIJ), transmits from Tijuana International Airport in Mexico. TIJ is not in the Southern California TRACON area because it is not in the United States. However, it is used for navigation due to its proximity to the San Diego region.

#### **FAR Part 77 Imaginary Surfaces**

There are numerous terrain and structural obstructions in the vicinity of the Airport affecting air navigation to and from SDIA. Federal Aviation Regulation (FAR) Part 77 defines the standards for determining obstructions to navigable airspace around an airport. Objects penetrating the imaginary surfaces established in FAR Part 77 are defined as obstructions. Part 77 imaginary surfaces are dimensional planes extending outward and upward from the runway. Their length, width, slope and elevation are defined by the type of runway (air carrier, GA, etc.) with which they are associated.

There are five imaginary surfaces:

- Approach
- Transitional
- Primary
- Horizontal
- Conical

The shapes, dimensions, and locations of the imaginary surfaces are illustrated in **Figure 3.2-3**.

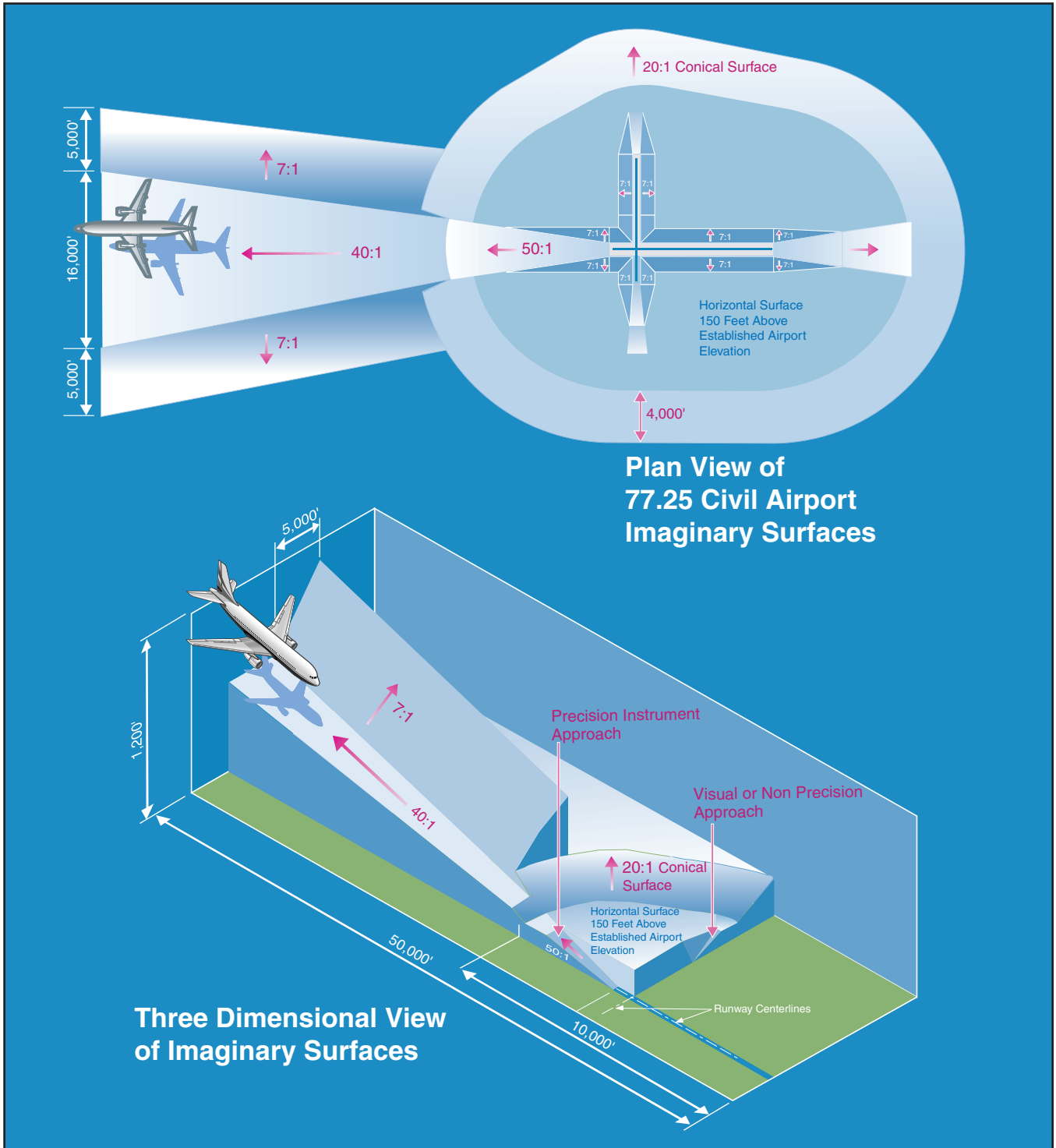
#### **Obstructions**

In accordance with a series of interagency agreements with the Federal Aviation Administration (FAA), the National Geodetic Survey (NGS) provides obstruction and other aeronautical data critical to the operation of the national airspace system. Most of this data is source information obtained using field survey and photogrammetric methods and is incorporated in airport obstruction chart (OC) development.

The National Aeronautical Charting Office, a division of FAA, published a new obstruction chart for SDIA dated September 30, 2004. Information from the chart, as presented in **Figure 3.2-4**, identifies obstructions in the approach and primary surfaces of the runways. As depicted in **Figure 3.2-4**, there are numerous obstructions along the approach path to both Runways 9 and 27. Displaced thresholds at each runway end are required because of these obstructions. The Runway 9 threshold is displaced 700 feet due to the presence of a tree approximately 550 feet from the runway end. The Runway 27 landing threshold displacement of 1,810 feet is a result of a sign approximately 260 feet from the runway end.

#### **Wind Coverage and Weather Summary**

Wind coverage for Runway 9-27 for both 10.5-knot and 20-knot crosswind components is provided in **Table 3.2-1**. The 10.5-knot and 20-knot wind coverages are applicable to all aircraft operating at the Airport. Wind coverages were calculated from the wind roses provided in **Figure 3.2-5**. Three weather



**Figure 3.2-3**

**Part 77 Surfaces**



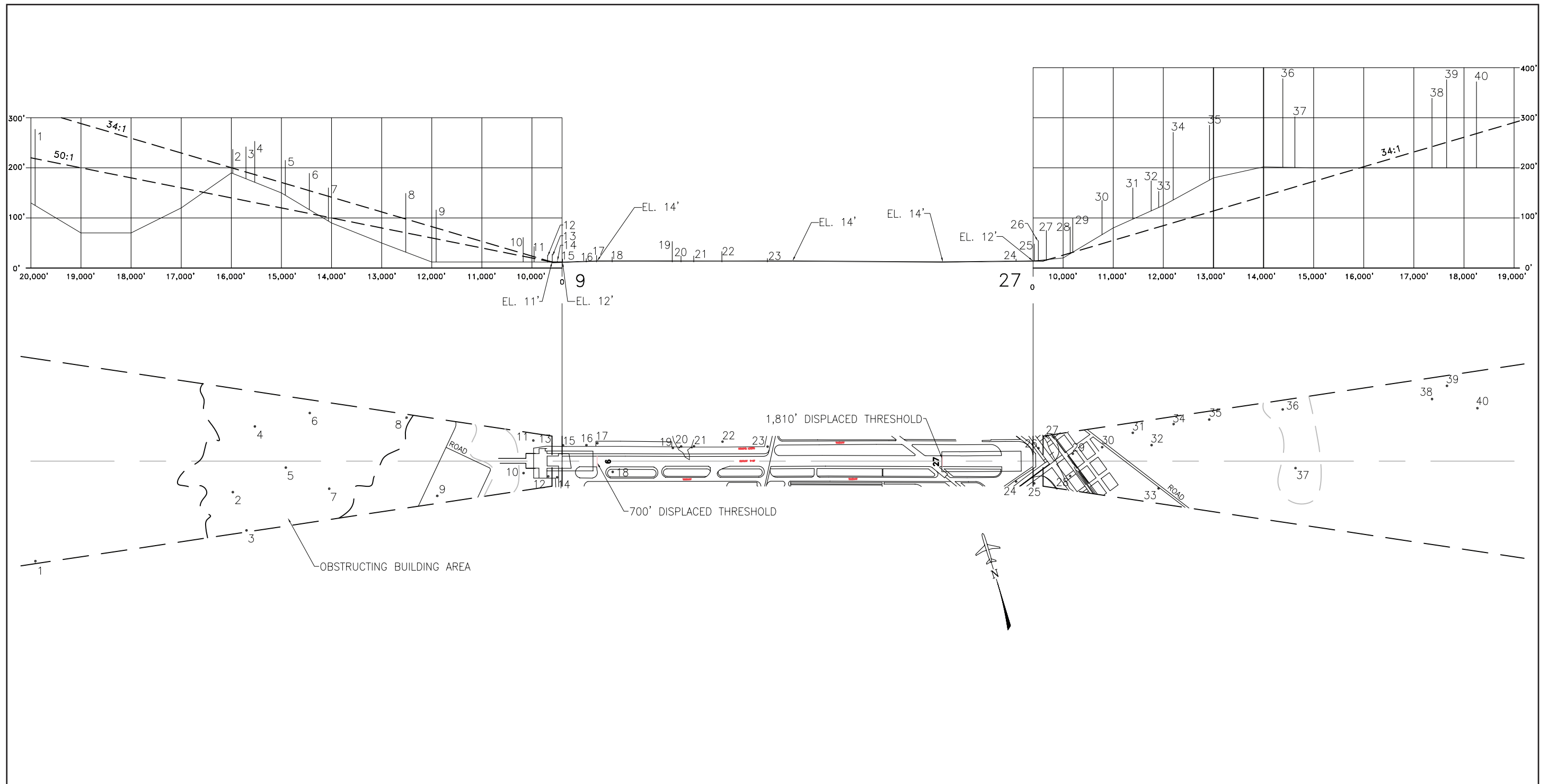


Figure 3.2-4



Airport Approach Plan & Profile



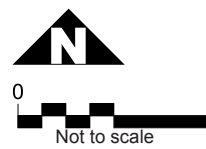
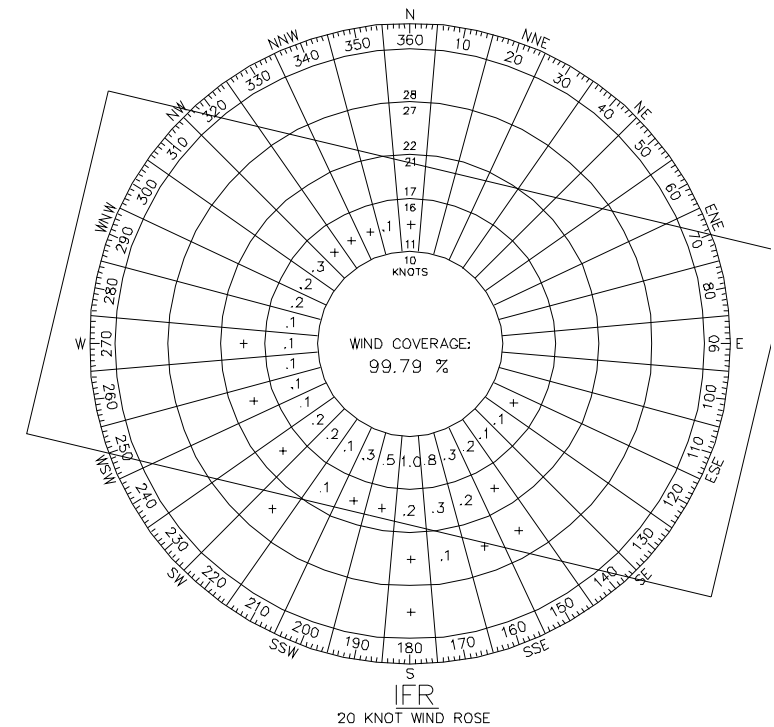
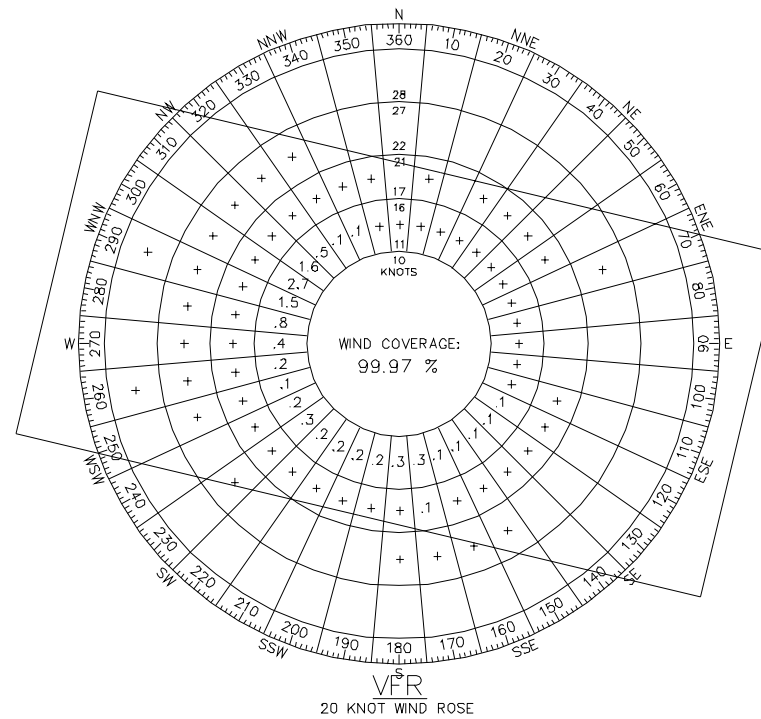
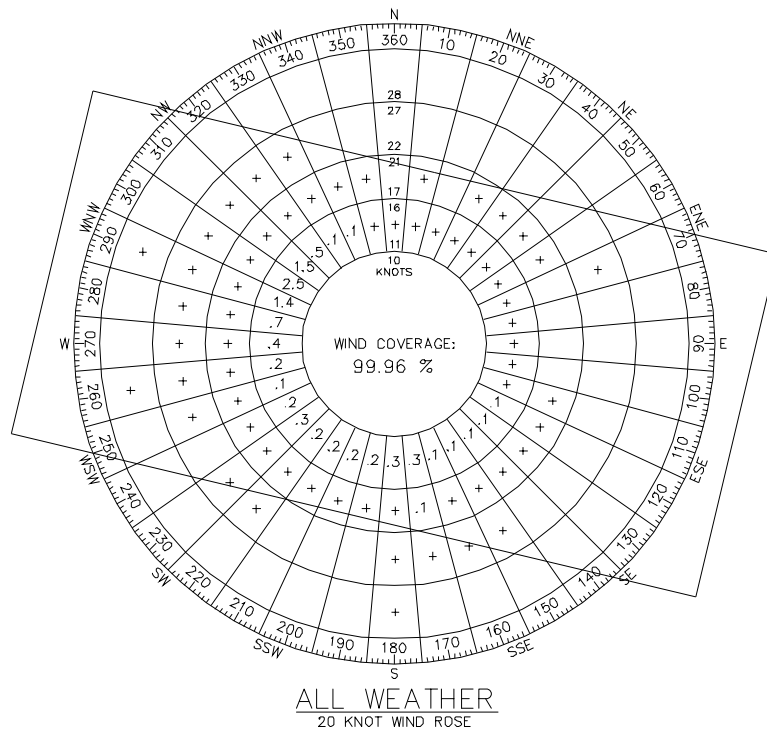
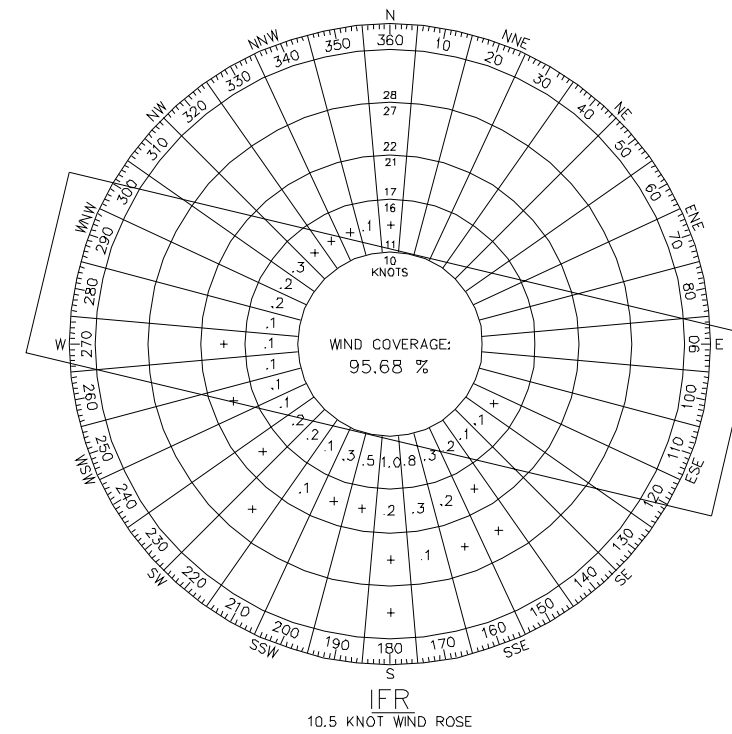
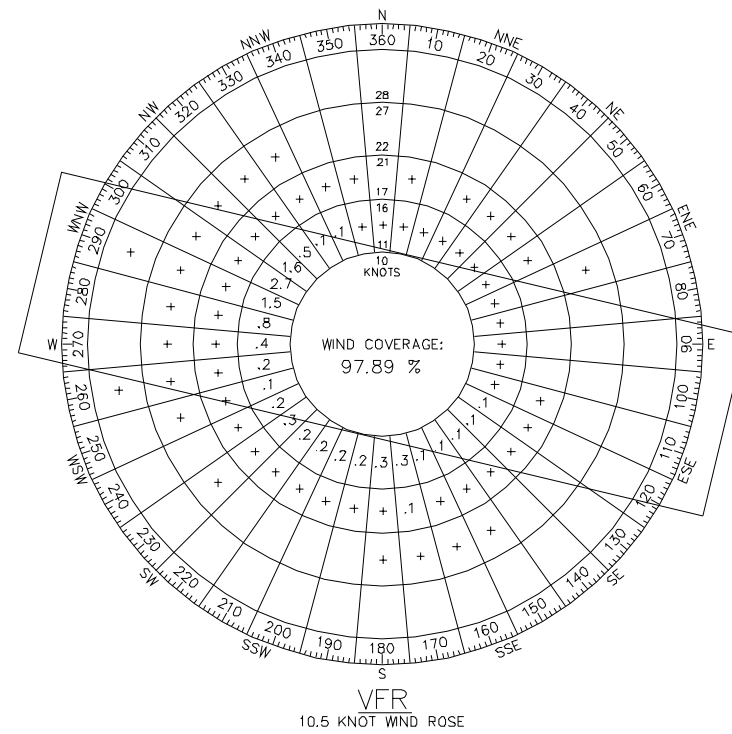
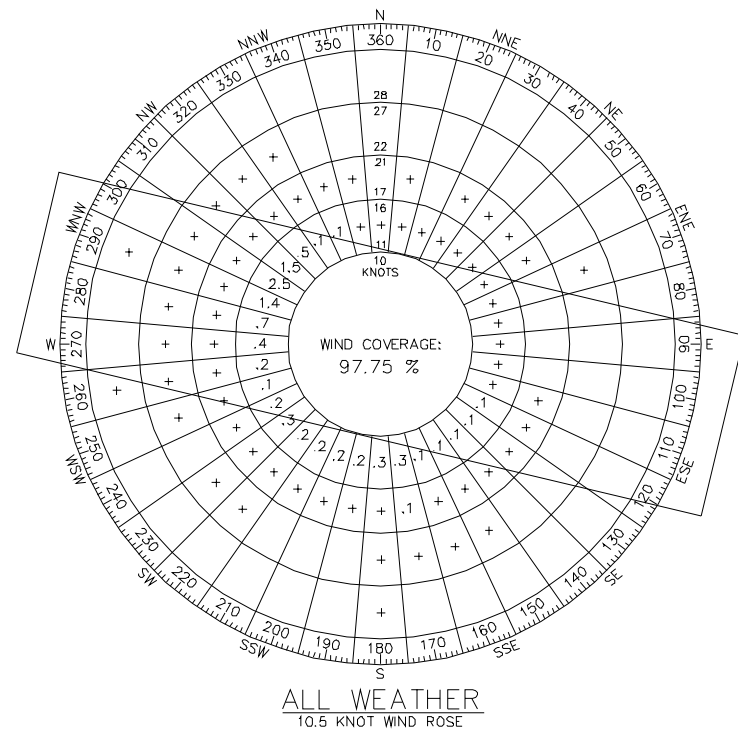


Figure 3.2-5

Wind Roses





### 3. Inventory of Existing Conditions

conditions were analyzed: All-weather, Visual Flight Rules (VFR), and Instrument Flight Rules (IFR). VFR conditions occur when the cloud ceiling is greater than or equal to 1,000 feet and horizontal visibility is greater than or equal to three miles. IFR conditions occur when the ceiling drops below 1,000 feet and visibility is less than three miles. The analysis demonstrates that the existing runway exceeds the FAA's guideline of at least 95 percent coverage for both the 10.5- and 20-knot wind conditions for all-weather categories. The wind coverage for a 10.5-knot crosswind exceeds 95 percent for IFR conditions and exceeds 97 percent for all-weather and VFR conditions. The wind coverage for a 20-knot crosswind component exceeds 99 percent for all-weather, VFR, and IFR conditions.

**Table 3.2-1**

**Wind Coverage**

Observations	Runway <sup>1</sup>	Wind Coverage	
		10.5 knots	20 knots
All-Weather Observations	9	28.47%	29.63%
	27	75.31%	76.37%
	Combined	97.75%	99.96%
VFR Observations	9	27.85%	28.88%
	27	76.15%	77.20%
	Combined	97.89%	99.97%
IFR Observations	9	33.17%	36.23%
	27	62.52%	63.57%
	Combined	95.68%	99.79%

<sup>1</sup> Magnetic variation - 13.3 degrees east

Sources: National Climatic Data Center and HNTB analysis.

San Diego is characterized by favorable weather conditions with IFR conditions at the Airport occurring approximately 7 percent of the time. IFR conditions in San Diego generally result from the marine layer, which occurs when fog forms over the ocean and moves on-shore.

#### **Airfield Use**

This section provides documentation of airfield operating procedures and practices at the Airport. This information establishes the basis for airfield facility requirements and was collected using existing data, field observations, and interviews with air traffic controllers and airport operations personnel.

#### **Runway Use**

SDIA has three distinct operational modes: arrivals and departures on Runway 27 (west flow), arrivals and departures on Runway 9 (east flow), and arrivals to Runway 9 and departures on Runway 27 (head to head). The mode of operation at SDIA is primarily based on weather conditions. However, wind conditions can also impact the operational mode. For example, when the cloud ceiling is greater than 700 feet and visibility is greater than two miles, Runway 27 has over 99.9 percent coverage with a 20-knot crosswind. This means that during clear conditions, Runway 27 is useable 99 percent of the time. However, based on minimum ceiling visibility requirements (weather), Runway 27 operates approximately 97 percent of the time. The visibility minimums driving changes to the runway operation ("flow") at SDIA are shown in **Table 3.2-2**.

### 3. Inventory of Existing Conditions

---

Table 3.2-2

Operational Visibility Minimums

---

---

Flow	Ceiling	Visibility
West (Arrivals & Departures - Runway 27)	> 700 feet	> 2 miles
East (Arrivals & Departures - Runway 9)	< 700 feet	< 2 miles
Mixed (Arrivals Runway 9 – Departures Runway 27)	< 300 feet	< 1 miles

---

Source: Federal Aviation Administration (FAA).

---

The percentage of time each weather condition occurs closely corresponds with the runway utilization. SDIA operates in west flow approximately 97 percent of the time, east flow approximately 2.5 percent of the time and mixed flow approximately 0.5 percent of the time.

#### Arrivals

The arrival capacity of the San Diego airspace is equal for both east and west flow. However, due to the layout of the airfield, Runway 27 operates more efficiently and is preferred by air traffic control. The configuration of taxiways and the location of the terminal area relative to the runway result in a more efficient operation during west flow.

Runway 27 arrivals typically use Taxiway exits B4 through B7. Taxiway B5 and B6 are located approximately 4,500 feet and 5,600 feet, respectively, from the runway threshold and are angled approximately 55 degrees to facilitate a more efficient exit path for arriving aircraft. Of the four angled exit taxiways, exits B5 and B6 have the heaviest use. Field observations from the San Diego Air Traffic Control Tower (ATCT) concluded aircraft repeatedly demonstrate runway occupancy times of 50 seconds or less using these exits. Runway occupancy time of 50 seconds or less enables air traffic controllers to decrease in-trail separation between like aircraft during visual weather conditions, maximizing runway efficiency and throughput. In-trail separation is the distance between aircraft in flight along the flight path. Minimum in-trail separation is 2.5 nautical miles (NM). Because two aircraft can never be on the runway at the same time, aircraft must have sufficient time to land, slow down, and exit the runway prior to the following aircraft crossing the runway threshold. Low runway occupancy time and decreased in-trail separation combined together produce higher aircraft arrival rates.

As noted previously, there are no high-speed exit taxiways for Runway 9 arrivals. The lack of high speed exit taxiways increases runway occupancy time for landing aircraft as aircraft must exit the runway at slower speeds. The higher runway occupancy time leads to increased in-trail separation between arriving flights. During east flow, aircraft arrival rates are lower than during west flow.

When the weather falls below VFR minimums (**Table 3.2-2**), air traffic controllers enforce five-mile in-trail separation. Because the airport typically operates in east flow during these conditions, there is an additional correlation between east flow and lower airfield efficiency and capacity. SDIA operates in east flow a low percentage of time. However, during east flow, heavy delay is typically experienced.

#### Departures

Departure Procedures (DPs) are designated routes that departing aircraft must follow in the air after taking-off. A minimum of 2.5 NM of in-trail separation is required between departing flights. If only one departure route is available from a given runway, no additional aircraft are able to depart until the first has

### 3. Inventory of Existing Conditions

---

traveled 2.5 NM or more in order to maintain the required in-trail separation. It is possible to have more than one departure route from a single runway. In cases where multiple routes are available, the routes are analogous to a fork in the road. As flights depart, they alternate between the available routes reducing the traffic on a single route and allowing more aircraft to depart in a given time period.

One benefit of using Runway 27 is that it has three diverging departure routes. If two aircraft are in sequence to depart Runway 27, and if each flight utilizes a different departure route, the second aircraft can be cleared almost immediately after the first aircraft clears the runway. The availability of diverging departure routes increases departure capacity and reduces delay for departing flights.

Due to the terrain and structural obstructions east of the airfield, Runway 9 is limited to a single departure route off the end of the runway. Consequently, Runway 9 has a lower departure rate as aircraft must wait for the preceding flight to clear the airspace. The wait times for successive departures can result in delay.

As stated previously, SDIA runway use is typically determined by weather conditions (the cloud ceiling altitude and visibility), not wind conditions. Therefore, when low visibility weather conditions require use of Runway 9, departures typically take-off with a tailwind.

Tailwinds reduce aircraft takeoff performance. During east flow, which occurs approximately 3 percent of the time at SDIA, approximately 30 percent of departing aircraft voluntarily delay their departures. Voluntary delay occurs when a pilot chooses to hold his flight on the ground and wait for clearance to take off from Runway 27 so that he is able to take off with a headwind. Existing runway length at SDIA is insufficient for some fully loaded aircraft to take off with a tailwind. Pilots will choose to take on delay in these situations because low visibility conditions are most common during the spring months of May and June during which fog is present during the morning hours and typically clears at mid-day. Pilots will wait for the weather to improve and for air traffic control to resume west flow.

These factors contribute to the relative prevalence of delay during east flow conditions when arrivals and departures occur on Runway 9. Thus, Runway 27 provides greater departure capacity and more efficient overall operation than Runway 9.

When the airfield is operating in mixed flow with arrivals to Runway 9 and departures on Runway 27, controllers work to accommodate alternating banks of arrivals or departures. When the Airport is in departure mode, all arriving aircraft are held in the system outside of San Diego airspace. This requires coordination with the Southern California TRACON as well as the Los Angeles Air Route Traffic Control Center (ARTCC). During arrival mode, departing aircraft at the airport are held on the ground either at the gate or in a taxiway queue.

#### **Airfield Operations**

The airfield taxiway system at SDIA has several non-standard characteristics which lead to reduced efficiency and safety.

Runway 9-27 is supported by one full-length parallel taxiway: Taxiway B. Taxiway B is south of Runway 9-27 and has two key constraints:

1. Taxiway B does not meet the FAA design criteria for centerline separation from Runway 9-27, which is 400 feet. The existing centerline separation between Taxiway B and Runway 9-27 is 362.5 feet.
2. Several structures on the former Teledyne-Ryan property in the southeast portion of the airport are within the taxiway Object Free Area (OFA). These structures prevent Taxiway B from being fully capable of handling Group V aircraft such as the Boeing 777 and 747.

The Taxiway B OFA restriction requires that Group V aircraft, heading east from the terminal area to the Runway 27 threshold for departure, take a circuitous route. Group V aircraft must taxi east on Taxiway B,

### **3. Inventory of Existing Conditions**

---

cross Runway 9-27 at Taxiway C4, continue taxiing east on Taxiway C, cross the runway again at Taxiway D and turn east on Taxiway B1 to the Runway 27 end. The elimination of the required runway crossings would improve both efficiency and safety.

Taxiway C serves the north side of the runway. Taxiway C only extends along the eastern half of the runway. Extending Taxiway C west to the Runway 9 end would require acquisition of property from the Marine Corps Recruit Depot (MCRD), which is adjacent to the airport. The Authority has negotiated terms to acquire the necessary land from the MCRD. However, there are no current plans to acquire the required property.

The constrained taxiway system at SDIA leads to congestion and inefficiency and results in operational constraints. Because Taxiway C does not extend to the Runway 9 end, during east flow (Runway 9 arrivals and departures), aircraft taxiing from the north side of the Airport must cross the runway to get to the Runway 9 end via Taxiway B. Further, during east flow, aircraft departure queues build on Taxiway B and block ingress and egress from the terminal area taxi lanes, which provide access to the gates.

The absence of full-length, dual, parallel taxiways at SDIA has led to conflicts between arriving and departing aircraft. After arriving Runway 27, aircraft typically exit the runway on to Taxiway B and taxi west to the terminal area. However, aircraft taxiing from the terminal area to Runway 27 for departure must taxi east on Taxiway B. During heavy traffic, arriving flights must taxi west on the runway to avoid eastbound taxiing aircraft on Taxiway B. The longer arriving aircraft must stay on the runway, the greater the runway occupancy time. Higher runway occupancy time increases the required in-trail separation for arrivals. Greater in-trail separation for arrivals reduces runway capacity.

The proximity of the terminal facilities to Taxiway B reduces airfield efficiency and capacity. Insufficient separation between the Terminal 1 gates and Taxiway B results in an obstruction to taxiing aircraft on Taxiway B when departing aircraft push from their gates at Terminal 1.

Lastly, there is no existing hold apron available at the departure end of Runway 27. Currently, aircraft awaiting departure clearance wait on Taxiway D, or Taxiway B1 to avoid obstructing aircraft taxiing along Taxiway B. However, this area is limited in capacity to two narrow body jet aircraft and the queue cannot be shuffled once aircraft are in line for departure.

#### **Air Traffic Control Coordination**

The controlled airspace for Naval Air Station (NAS) North Island and Montgomery Field are adjacent to SDIA's controlled airspace. The SAN ATCT maintains Letters of Agreement (LOAs) with the NAS North Island ATCT and the Montgomery Field ATCT. The LOAs establish standard operating procedures for coordination of air traffic between the ATCTs. The SDIA ATCT regularly coordinates aircraft arriving into these facilities. The activities are typically IFR aircraft, requiring coordination and acceptance by local control and vector into SDIA's arrival sequence.

#### **Noise Abatement**

Noise Abatement procedures are in effect at SDIA from 10:00 PM to 7:00 AM for departing aircraft only. Takeoffs are prohibited between 11:30 PM and 6:30 AM daily except for emergency, mercy flights, and military flights of necessity. Take-offs are restricted to the following aircraft between the hours of 10:00 p.m. and 11:30 p.m. and between 6:30 a.m. and 7:00 a.m.:

- An FAA certificated Stage 3 aircraft; or
- A non certificated aircraft which does not exceed 89 EPNdB at the FAR Part 36 takeoff reference point per FAA AC 36-2C; or
- A Non-Stage 3 certificated aircraft, specifically certificated as a "Stage 3 aircraft" for the purpose of the Airport Use Regulations. This certification requires prior approval of the Deputy Director, Airport

### 3. Inventory of Existing Conditions

---

Noise Mitigation, and may involve mandatory noise testing at SDIA before regular operations are conducted.

Stage 3 aircraft are part of an FAA-established classification system used to determine the noise level of an aircraft based on weight, number of engines, and occasionally, passenger capacity. Aircraft may be certified as Stage 1, 2, or 3 as follows:

- Stage 1 aircraft are the oldest and noisiest and are not permitted to operate in the United States as commercial aircraft.
- Stage 2 aircraft include the older Boeing 737-100/200, 727-100/200 and the DC-9. Stage 2 aircraft were required by law to be phased out of service by January 1, 2000.
- Stage 3 aircraft meet current standards set by the FAA and generally are quieter. Examples of Stage 3 aircraft include the Boeing 737-300/400/500/600/700/800/900, 757-200/300, 767-200/300/400ER; the Airbus A319/A320; and the MD 80/90. Some Stage 2 aircraft have been re-engined or modified with a hush-kit to meet Stage 3 noise standards.

#### **Aircraft Apron Area Parking/Remain Overnight Parking**

Currently, there are 41 active jet gates at SDIA. All gates are served by loading bridges with the exception of Gate 19. **Figure 3.3-5** depicts the current aircraft parking layout by specific gauge and carrier at the Airport. It identifies the respective loading bridge manufacturer and model at each gate and the performance characteristics of the equipment. **Figure 3.3-5** also shows the specific size of aircraft at each gate accommodation.

**Figure 3.3-6** presents the current RON parking positions at SDIA. Existing positions are located on the west end of Terminal Two West, to the east of Terminal One, and to the north of Runway 9-27.

#### **3.2.2 Airspace**

Airspace over San Diego and all of the United States is under the jurisdiction of the FAA. This administration was established by Congress via the Federal Aviation Act of 1958. The FAA established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe and efficient airspace environment for civil, commercial, and military aviation. The NAS is defined as the common network of U.S. airspace, including air navigation facilities; airports and landing areas; aeronautical charts and information; associated rules, regulations, and procedures; technical information; personnel; and material. System components shared jointly with the military are also included.

#### **National Airspace Structure**

Airspace is classified by the FAA as either controlled or uncontrolled. Controlled airspace is supported by ground-to-air communications, navigation aids, and air traffic services. In September 1993, the FAA completed an 11-month major airspace reclassification effort. The new classifications, terminology, and their relationship to the old system are depicted in **Figure 3.2-6**.

The San Diego regional airspace consists of the following classifications:

- Class A: All airspace between 18,000 feet Mean Sea Level (MSL) and 60,000 feet MSL
- Class B: Airspace (formerly the SDIA Terminal Control Area)
- Class D: Airspace for airports with ATCTs, including control zones and airport traffic areas
- Class G: Uncontrolled airspace

Class C Airspace and Class E Airspace are not present in the San Diego area.

### **3. Inventory of Existing Conditions**

---

#### **Class A Airspace**

Class A airspace is also known as en-route airspace, which includes all airspace between 18,000 feet MSL and 60,000 feet MSL. Class A airspace also includes the airspace overlying the waters within 12 NM of the contiguous United States and Alaska. All persons operating aircraft in Class A airspace must operate under Instrument Flight Rules (IFR).

#### **Class B Airspace**

**Figure 3.2-7** illustrates the extent of San Diego Class B airspace. Nationally, Class B airspace is established at 29 high-density airports as a means of regulating air traffic activity in these areas. It is established on the basis of a combination of enplaned passengers and volume of operations.

Class B airspace is designed to regulate the flow of air traffic above, around, and below the arrival and departure airspace required for high-performance and passenger-carrying aircraft at major airports. Class B airspace is the most restrictive controlled airspace routinely encountered by pilots operating under VFR in a controlled environment.

Aircraft must have special radio and navigation equipment, and pilots must obtain clearance to fly through Class B airspace. To operate within Class B airspace, pilots at minimum must have a private certificate or a student must meet FAR Part 61.95 requirements that regulate special ground and flight training for Class B airspace. Helicopters do not need special navigation equipment or a transponder if they operate at or below 1,000 feet and have made prior arrangements in the form of an LOA with the FAA for Class B operation.

#### **Class C Airspace**

Class C airspace is centered on airports with air traffic control towers other than the busiest 29 airports in the United States. Class C airspace is not present in the San Diego area.

#### **Class D Airspace**

The airspace under the jurisdiction of a local ATCT is called Class D airspace, which includes airspace within a horizontal radius of 5 NM of an airport, extending from the surface (ground level) up to a designated vertical limit above airport elevation. The purpose of Class D airspace is to provide ATCT-controlled airspace for aircraft in and around the immediate vicinity of an airport. Aircraft operating within this area are required to maintain radio communications with the ATCT. NAS North Island, Montgomery Field, Gillespie Field, Naval Outlying Field (NOLF) Imperial Beach, Marine Corps Air Station (MCAS) Miramar, and Brown Field all operate in Class D airspace.

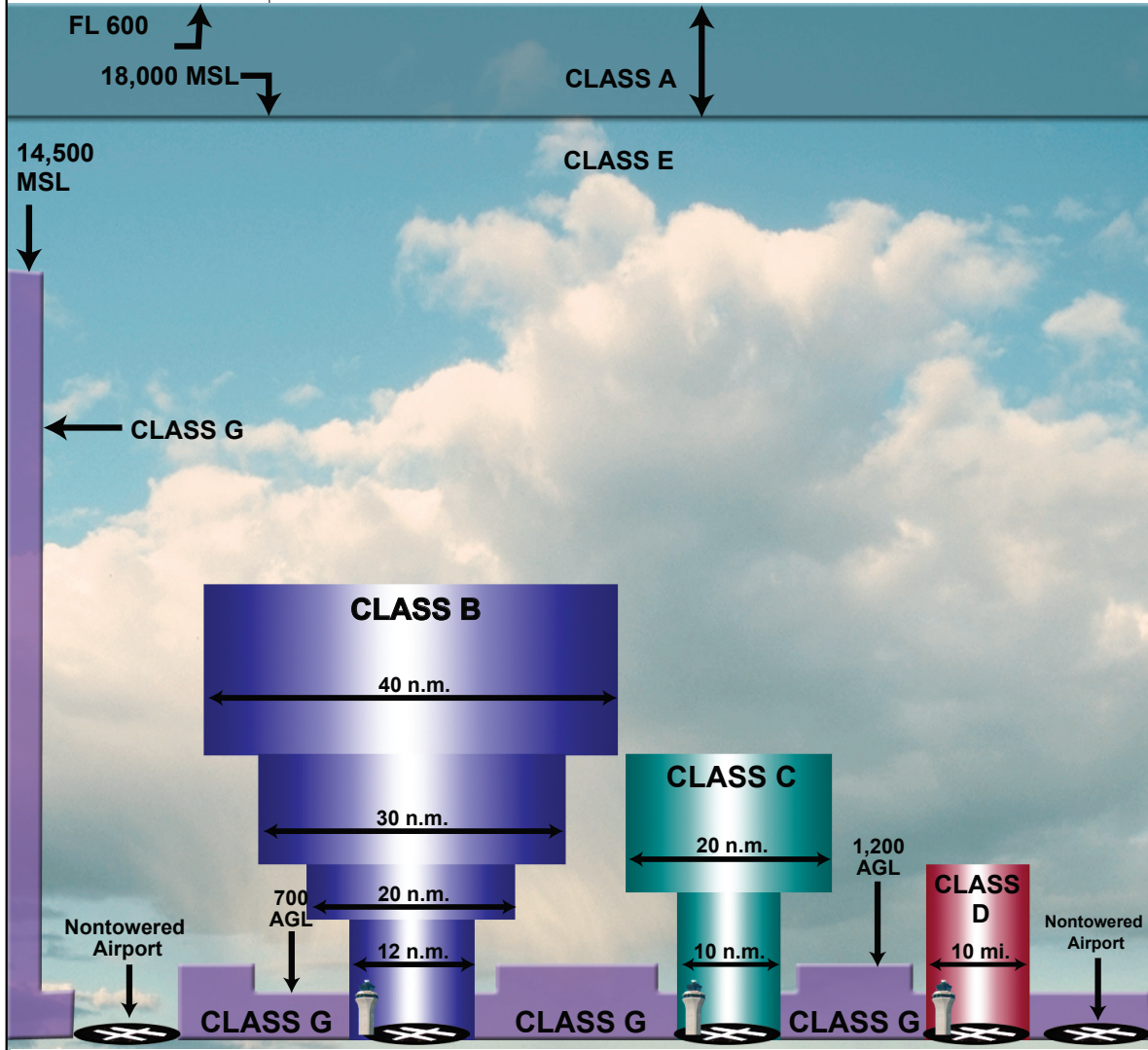
#### **Class E Airspace**

Generally, if the airspace is not Class A, Class B, Class C, or Class D, and it is controlled airspace, it is Class E airspace. Class E airspace is not present in the San Diego area.

#### **Class G Airspace**

Class G airspace is uncontrolled airspace not designated as Classes A, B, C, D, or E. Class G airspace is present in the San Diego area.

Classification	Definition
<b>CLASS A</b>	Airspace above 18,000 feet MSL up to and including FL 600.
<b>CLASS B</b>	Multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports.
<b>CLASS C</b>	Airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control.
<b>CLASS D</b>	Airspace from the surface to 2,500 feet AGL surrounding towered airports.
<b>CLASS E</b>	Controlled airspace that is not Class A, Class B, Class C, or Class D.
<b>CLASS G</b>	Uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E.



**Legend**  
 AGL - Above Ground Level      FL - Flight Level in Hundreds of Feet      MSL - Mean Sea Level

**Figure 3.2-6**

**Airspace Classification**

NOT TO SCALE





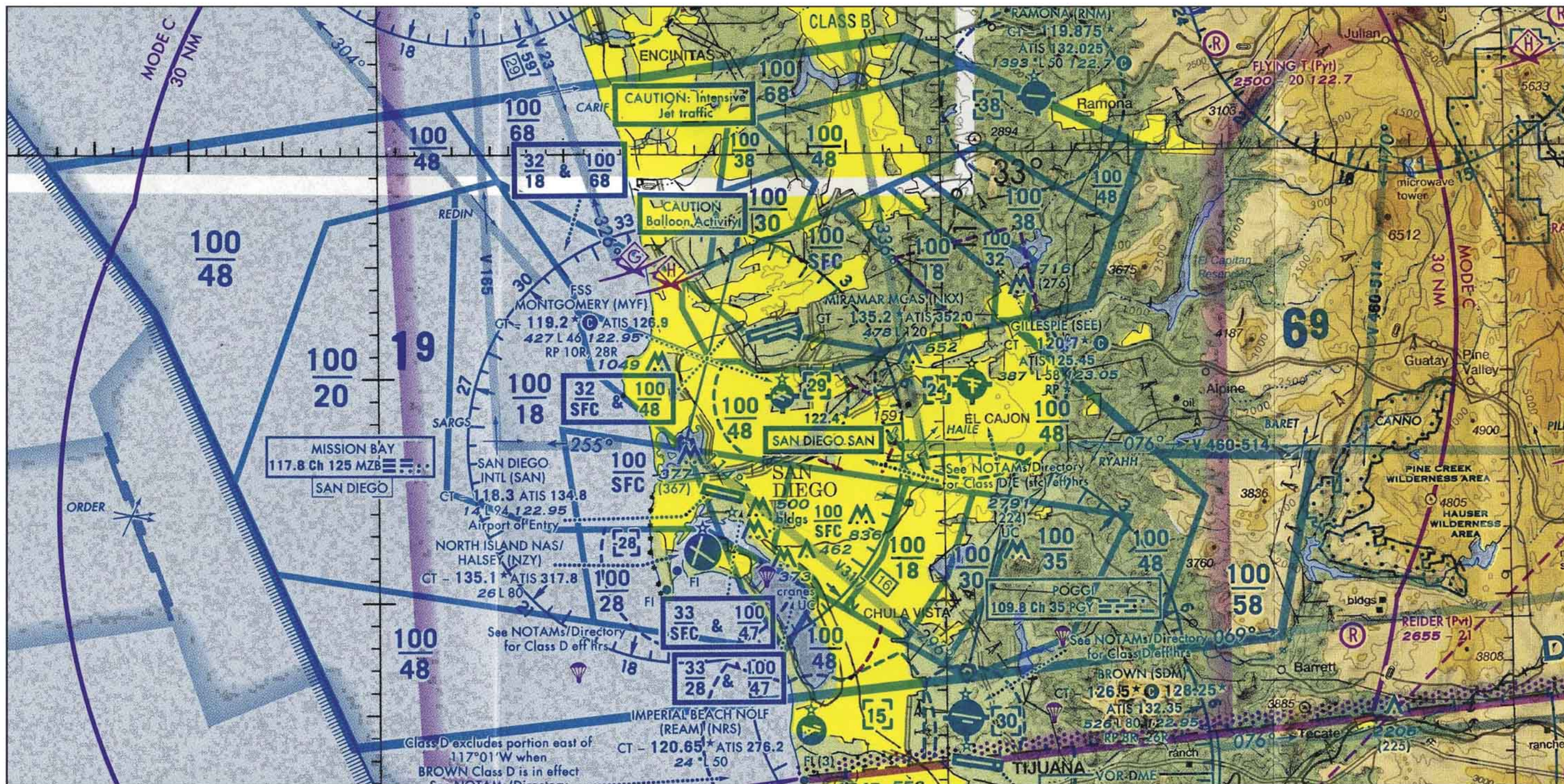


Figure 3.2-7

San Diego Class B Airspace



#### **Delegation of Air Traffic Control Responsibilities**

Air traffic is controlled at three primary levels:

- Air Route Traffic Control Center (ARTCC)
- Terminal Radar Approach Control (TRACON)
- Air Traffic Control Tower (ATCT)

ARTCCs or "centers" control aircraft operating under IFR in controlled airspace and in en-route phases of flight. There are 21 ARTCC facilities responsible for airspace in the continental United States. San Diego is in the Los Angeles ARTCC, whose jurisdiction includes Southern California and parts of Nevada, Utah, and Arizona. The Los Angeles ARTCC airspace, relative to the overall U.S. airspace system, is depicted in **Figure 3.2-8**.

The next level of air traffic control is provided by a TRACON. The ARTCC delegates certain airspace to local terminal facilities, which are responsible for the orderly flow of air traffic arriving and departing the major air terminals. The Los Angeles ARTCC has delegated airspace in the San Diego region to the Southern California TRACON. The Southern California TRACON boundary is depicted in **Figure 3.2-9**.

The Southern California TRACON delegates portions of its airspace to local ATCTs. The towers represent the initial level of aircraft control for departures and the final level for arrivals. Airspace delegated to the SAN ATCT is depicted in **Figure 3.2-7**. The ATCT is responsible for all aircraft arriving and departing SDIA and has some coordination responsibilities for operations into NAS North Island, Brown Field, and Montgomery Field.

#### **Local Air Traffic Control Procedures**

##### **Visual Flight Rules (VFR) Procedures**

Commercial and GA aircraft operating under VFR with FAA-filed flight plans enter the SDIA terminal area under positive control of the Los Angeles ARTCC. The Los Angeles ARTCC then relays control to the TRACON, which gives the information to the tower during final approach to the airport. Some general aviation activity may approach SAN's class B airspace from Glass G airspace, which is uncontrolled. However, all aircraft operating within the SAN Class B airspace are under positive control of the TRACON or a local air traffic control tower. Aircraft wanting to land at SDIA must contact the TRACON prior to entering the Class B airspace and the ATCT prior to landing. The assigned arrival procedure will vary depending on the operational flow of the Airport and volume of traffic.

Aircraft departing SDIA will receive clearance and departure instructions from the ATCT. The departure procedure will vary depending on destination, runways in use, and the volume of traffic. Aircraft leaving SDIA Class B airspace must comply with local airspace restrictions and contact the appropriate controlling agency to enter controlled or special use airspace.

##### **Instrument Flight Rules (IFR) Procedures**

Aircraft operating under IFR approach the SDIA area controlled by the Los Angeles ARTCC. The ARTCC then transfers arriving IFR aircraft to TRACON control by clearing the aircraft to the Airport via a Standard Terminal Arrival Route (STAR). A STAR is a pre-planned IFR arrival procedure published for pilot use. STARs use a combination of published VOR radials and intersections and assigned vectors, altitudes, and speeds to route aircraft into the arrival flow sequence. Aircraft are typically assigned to an arrival route to SDIA based on their city of origination.

### **3. Inventory of Existing Conditions**

---

Currently, there are three STARs at SDIA. They are depicted in **Figure 3.2-9** and described below:

- BARET FOUR ARRIVAL - provides guidance for aircraft arriving from the east to SDIA. The route begins at reporting point BARET to the east of SDIA and is aligned with the POGGI VOR to the south of SAN. Aircraft arriving to Runway 27 will intercept the localizer five miles from the VOR station. Aircraft arriving to Runway 9 will continue toward the station and then turn right toward the Pacific Ocean to intercept OCEANSIDE VOR radial 162 for a right turn to intercept the Runway 9 localizer at SDIA.
- HUBRD ONE ARRIVAL - provides guidance to aircraft arriving SDIA from the north and is aligned with the MISSION BAY VOR roughly five miles west of and parallel to the coastline. Aircraft are vectored to their final approach course to Runway 27 after passing the TORIE FIX.
- SHAMU ONE ARRIVAL - provides guidance for aircraft arriving to SDIA from the north and the west to intercept the localizer for Runway 9. The route begins at reporting point SHAMU, which is located 35 miles from the MISSION BAY VOR over the Pacific Ocean, and the route then follows a southbound heading followed by a left turn to intercept the Runway 9 localizer at reporting point SARGS.

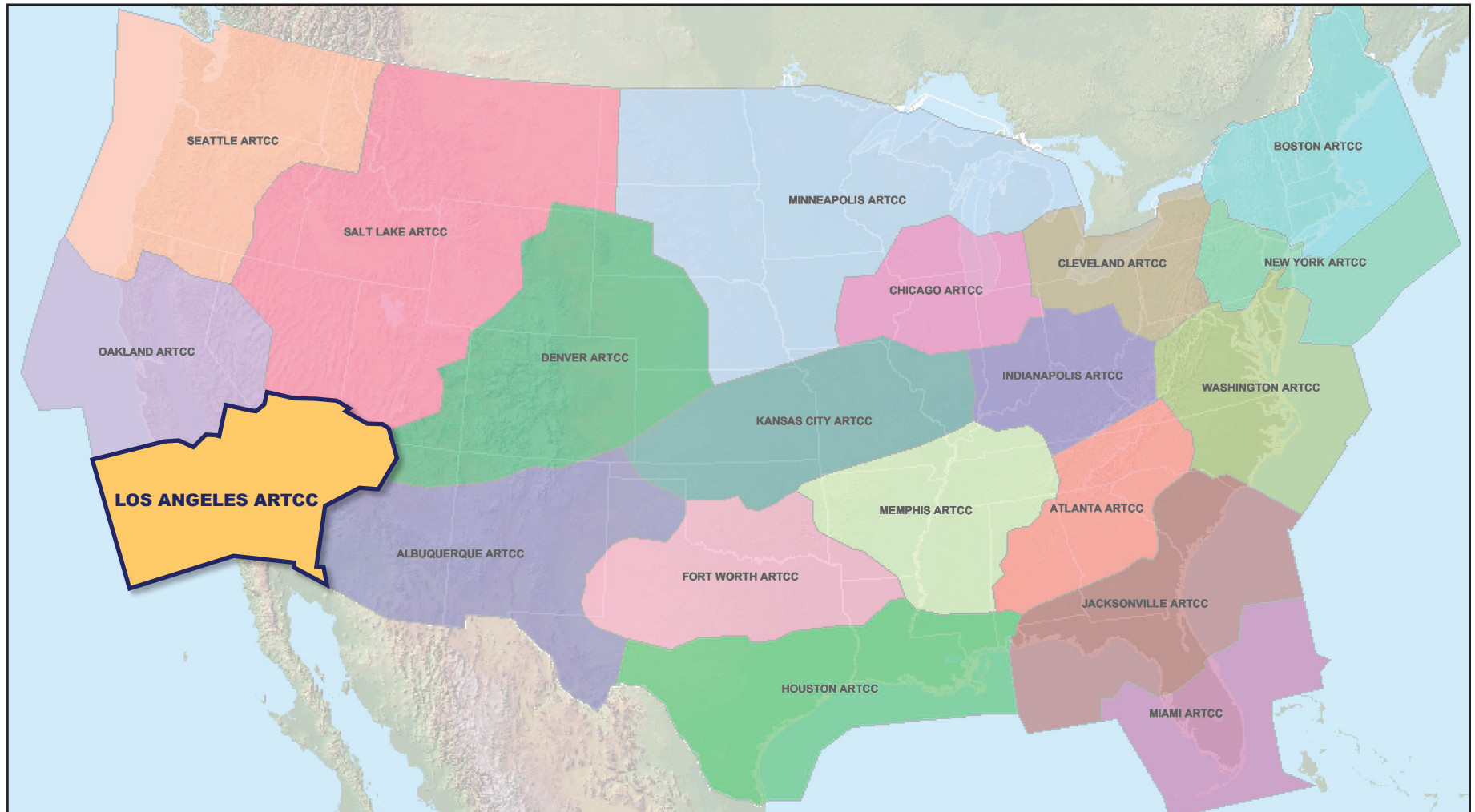
The FAA issues Departure Procedures (DPs) for departing IFR aircraft. It is more convenient for ATC to issue departure clearance with DPs, which help improve pilot/controller communication. Prior to departure, pilots are given a departure sequence by ATC, which includes instructions to fly a specified heading and altitude and then proceed with the assigned DP after clearance by ATC. DPs also aid the transition from the terminal airspace to the en route airways and facilitate the hand-off of aircraft from TRACON to ARTCC controllers.

There are three DPs for SDIA departures as depicted in **Figure 3.2-9** and described below:

- PEBLE THREE DEPARTURE - Aircraft departing Runway 27 climb right to intercept the MISSION BAY VOR and then proceed to the PEBLE intercept located approximately 69 miles northwest of the MISSION BAY VOR. Aircraft then transition to their assigned route and altitude.
- BORDER FIVE DEPARTURE - Aircraft departing Runway 9 climb on a 90 degree heading to intercept and proceed via the 96-degree radial from the MISSION BAY VOR to the BROWS intercept, where the aircraft then transition to their assigned routes. Aircraft departing Runway 27 climb and turn 180 degrees to the POGGI VOR. The aircraft then proceed to the BROWS intercept, transitioning to their assigned route and altitude.
- LNSAY TWO DEPARTURE - Aircraft departing Runway 9 climb via the runway heading to 4,000 feet and then turn left, heading 275 degrees to intercept and proceed via the 314 degree radial. From the 314 degree radial aircraft head to the MISSION BAY VOR and onto the LNSAY intercept, 25 miles northwest of the MISSION BAY VOR. Aircraft then transition to their assigned route. Aircraft departing Runway 27 make a right climb, turning 290 degrees to intercept and proceed onto the 155 degree radial of the OCEANSIDE VOR to the CLSTR intercept where they then transition to their assigned route and altitude.

#### **Neighboring Airports**

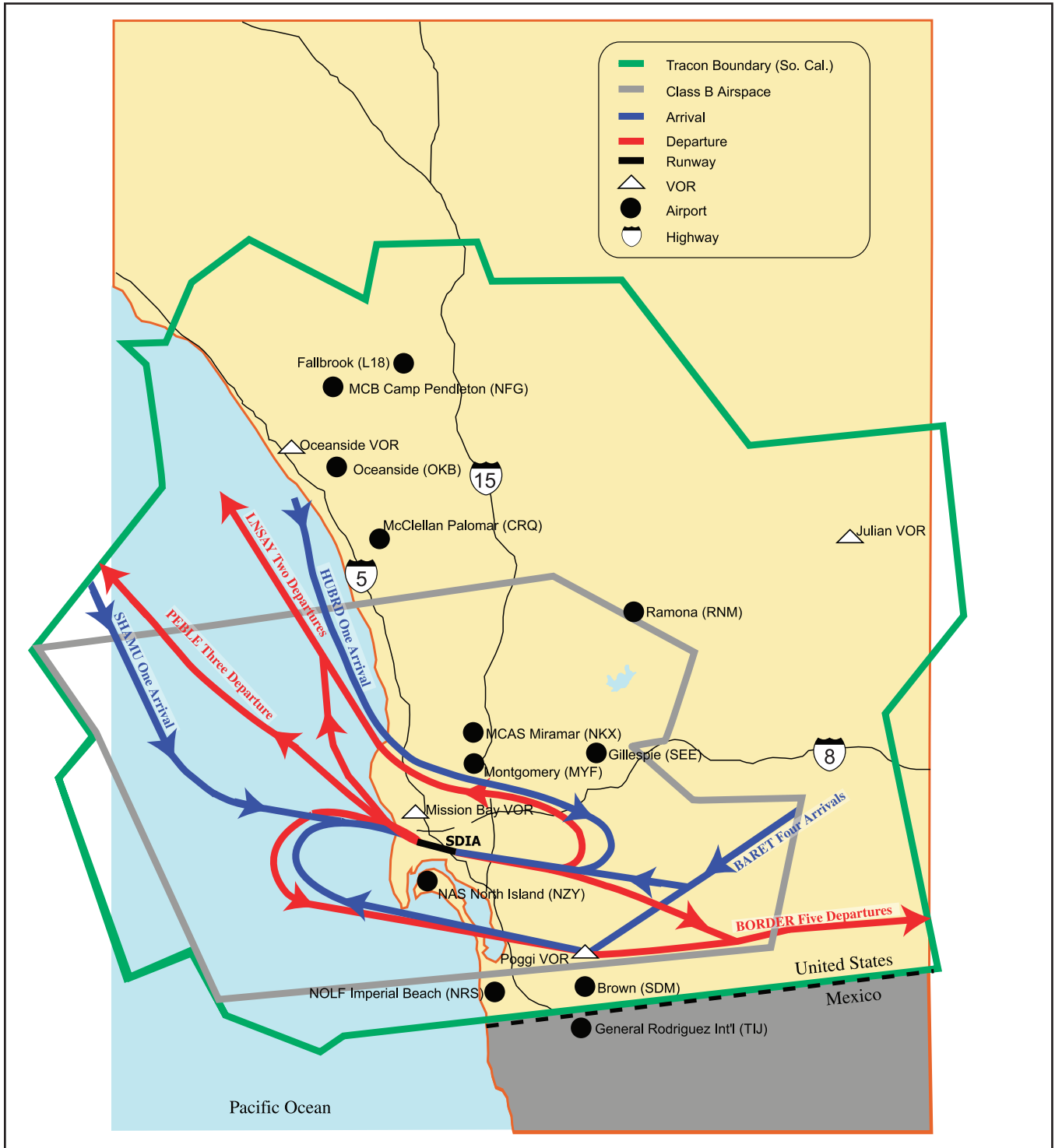
There are 12 airports operating within 30 NM of SDIA. The Master Plan does not include a regional analysis of these airports. However, analysis of the impact of these airports is being conducted as part of several other ongoing studies including the Airport Site Selection Program (ASSP), the Airport Land Use Commission (ALUC) update and the California Land Use Plan (CLUP). These studies are being conducted to determine potential improvements and potential demand for the San Diego region in addition to other data. An overview of these airports is listed in **Table 3.2-3** and depicted in **Figure 3.2-10**.



**Figure 3.2-8**

**Los Angeles Air Route Traffic Control Center ARTCC**





**Figure 3.2-9**

NOT TO SCALE

**Regional Airspace**







**Figure 3.2-10**

**N**  
**NOT TO SCALE**

**Regional Setting**



### 3. Inventory of Existing Conditions

Table 3.2-3

Airports within 30 NM of San Diego International Airport

Airport Name	Designator	Runways	Length of Longest Runway	Role	Annual Operations	Commercial Service
<b>Public Use</b>						
General Rodriguez Intl.	TIJ	2	8,200'	Commercial	N/A	Yes
Brown Field	SDM	2	8,000'	GA	208,948	No
Montgomery Field	MYF	3	4,600'	GA	247,366	No
Gillespie	SEE	3	5,341'	GA	191,660	No
Ramona	RNM	1	4,000'	GA	135,700	No
McClellan-Palomar	CRQ	1	4,600'	Regional	204,200	Yes
Oceanside	OKB	1	2,712'	GA	48,000	No
Fallbrook	L18	1	2,160'	GA	8,800	No
<b>Private Use</b>						
Loma Madera	25CA	1	2,300'	Private	N/A	No
Pauma Valley	CL33	1	2,200'	Private	N/A	No
<b>Military</b>						
MCAS Miramar	NKX	3	12,000'	U.S. Navy	N/A	N/A
NAS North Island	NZY	2	8,000'	U.S. Navy	N/A	N/A
MCB Camp Pendleton	NFG	1	6006'	U.S. Navy	N/A	N/A
NOLF Imperial Beach	NRS	2	5,000'	U.S. Navy	N/A	N/A

Source: FAA Facility Directory, FAA Form 5010, ICAO Airport Characteristic Data Base.

The Abelardo L. Rodriguez International Airport (TIJ) in Tijuana, Mexico, provides air service for the Tijuana region of Baja California in northern Mexico. TIJ is located approximately 18 miles southeast of SDIA. The United States–Mexico international border is located approximately 12 miles south of Downtown San Diego.

Brown Field, located southeast of SDIA, remains under consideration for development by private investors as an air cargo facility. However, in late 2001 the prospect of major cargo development at Brown Field was rejected as a result of air traffic and aircraft performance studies for cargo aircraft at Brown Field. Mountainous terrain east of the airport obstructs the Brown Field arrival and departure paths east of the airport, preventing the larger cargo aircraft sufficient climb out clearance. In addition, active use of Brown Field as a logistics facility would require a head-to-head traffic pattern with arrivals from the west and departures to the west reducing the airport's capacity.

McClellan-Palomar Airport (CRQ), located 30 miles north of SDIA, in Carlsbad is the only other commercial service airport in San Diego County.

There are five major commercial service airports located within 150 miles of SDIA in the Los Angeles/Orange County Metropolitan area including (from nearest to furthest): John Wayne Airport in Santa Ana (SNA), Long Beach Airport (LGB), Ontario International Airport (ONT), Los Angeles International Airport (LAX), and Bob Hope Airport (BUR), formerly known as Burbank-Glendale-Pasadena Airport.

### ***3. Inventory of Existing Conditions***

---

This page intentionally left blank.