3.0 Facility Requirements

Facility requirements represent the estimated future infrastructure needed to accommodate forecast demand for those facilities based on the anticipated levels of based aircraft and operations as determined in the Forecast. The condition of the existing airport infrastructure and its capability to accommodate this need is also taken into account. Many of the requirements presented in this chapter are quantitatively determined by applying the Forecast to industry standard planning methodologies adjusted for local DVT conditions as discussed in each subsection. The quantitative requirements are supplemented with the qualitative recommendations and feedback of Airport staff, tenants, and other stakeholders gathered during tenant and user interviews along with technical and public advisory committee meetings. This chapter presents the facility requirements for airside, landside, general aviation, and support facilities.

3.1 Planning Horizons

As identified in Chapter 2, the Forecast projects based aircraft and operations through 2033. Using 2013 as the base year, the most recent year of complete operational statistics, the Forecast includes projections for four interim planning horizons each spaced five years apart, 2018, 2023, 2028, and 2033. **Table 3-1** summarizes the forecast of based aircraft and total operations for each of the planning horizons. The planning horizons will be used in subsequent sections to present the facility requirements for each facility analyzed.

Table 3-1: DVT Based Aircraft and Operations Forecast Summary

Year	Based Aircraft	Total Operations	Peak Month Operations
2013 (Existing)	1,033	363,352	36,246
2018	1,167	376,100	37,517
2023	1,329	425,633	42,458
2028	1,538	501,090	49,985
2033	1,780	590,239	58,878

Source: HNTB Analysis

3.2 Peaking Characteristics

The operational peaking characteristics defined in the Forecast are used extensively throughout this facility requirements chapter to analyze facility performance against predicted peak activity. An industry accepted methodology within airport planning is to analyze the facility requirements against an average day of the peak month (ADPM). This level of demand represents an increase over the activity associated with an average annual day (AAD) but does not account for the peak day of the peak month which often results in facilities that are substantially overbuilt. In addition to annual, monthly, and daily metrics, it is also important to understand what the peak hour aircraft operations demand will be on DVT's runways and taxiways to assess whether additional airfield capacity is warranted. **Table 3-2** summarizes the average peak monthly, daily, and hourly demands projected for DVT.

Table 3-2: DVT Peak Demand Forecast Summary

Year	Total Operations	Peak Month Operations	ADPM Operations[1]	Peak Hour Operations
2013 (Existing)	363,352	36,246	1,241	133
2018	376,100	37,517	1,284	137
2023	425,633	42,458	1,453	155
2028	501,090	49,985	1,711	183
2033	590,239	58,878	2,015	215

Source: HNTB Analysis
Note 1: ADPM = Average Day of the Peak Month

3.2.1 Airfield Capacity

Airfield capacity refers to the level of aircraft activity, as defined by hourly or annual aircraft operations that can be accommodated by the existing airfield system with an acceptable level of delay.

The FAA specified metric used for estimating annual airfield capacity is the annual service volume (ASV). The ASV utilizes peak hourly capacities of the airfield and ratios of annual to monthly demand and daily to hourly demand to reasonably estimate the annual capacity of the airfield. The ASV methodology is described in FAA Advisory Circular (AC) 150/5060-5: *Airport Capacity and Delay*, published on September 23, 1983. There are currently two primary methodologies used to estimate hourly airfield capacity for the ASV calculation. Historically AC 150/5060-5 has been used to determine the appropriate graphical layout of the airfield and incorporate assumptions about percentage of touch-and-go operations, flow directions, percentage of VFR and IFR, and location and quantity of runway exit taxiways. The second and significantly newer methodology was developed by the Transportation Research Board's (TRB) Airports Cooperative Research Panel (ACRP) Project 3-17 which utilizes a detailed Microsoft Excel spreadsheet model that takes into account additional inputs that influence capacity, including runway occupancy times, in-trail arrival separation distances, departure separation times, and several other operational dependencies. The results of both methodologies are described in this section.

3.2.1.1 AC 150/5060-5 Capacity Methodology

A description of the inputs needed for the ASV calculation under AC 150/5060-5 follows. The ASV for DVT was determined, in part, using the peak hour fleet mix breakdown from the Forecast. This fleet mix or operational breakdown is split according to the FAA's aircraft weight classifications:

- A: Single engine aircraft weighing 12,500 lbs. or less (e.g. Cessna 172)
- B: Twin engine aircraft weighing 12,500 lbs. or less (e.g. Beechcraft King Air)
- C: Large aircraft weighing greater than 12,500 lbs. but less than 300,000 lbs. (e.g. Boeing 737)
- D: Heavy jet aircraft weighing greater than 300,000 lbs. (e.g. Boeing 747)

DVT's fleet mix index is expressed by the mathematical sum of the percentage of large aircraft operations (Category C) weighing between 12,500 and 300,000 pounds and three times the percentage of heavy aircraft operations (Category D) weighing more than 300,000 pounds. Based on the fleet mix projected in the Forecast, DVT's fleet mix index for both VFR and IFR conditions is 3 (2% [C] + 3 x 0% [D]).

Given the high volume of flight training at DVT, it is important to also consider the extensive number of touch-and-go operations that occur. Touch-and-go operations take place when a pilot lands and departs without coming to a full stop. They are generally used for instructive purposes to expose a student pilot to multiple take offs and landings in a relatively short amount of time and for recurrent pilot training purposes. Officially, a touch-and-go is recorded as two operations by ATC. Similar to the previous Master Plan Update, the VMC touch-and-go factor at DVT is 1.36. It is assumed that touch-and-go procedures would be prohibited during IMC, and therefore, during IMC, the touch-and-go factor is 1.00, however, IMC only occurs approximately less than 2% of the year.

A key component of the runway capacity calculation is the percentage of arrival operations, expressed as the hourly ratio of arrivals (number of arrivals plus one half of the touch-and-go operations) to total operations (number of arrivals plus number of departures plus number of touch-and-go operations). The resultant VMC arrivals percentage is 43% and the resultant IMC arrivals percentage is 42%.

Another important contributor to runway capacity is the location, number, and adequacy of exit taxiways. The location of exit taxiways directly correlates with runway occupancy time. The higher the runway occupancy time, the lower the runway capacity, as it takes longer for aircraft to clear the runway. DVT's exit taxiways are generally located in positions that allow aircraft to efficiently clear the runway, which results in minimizing runway occupancy time. Runway exit taxiways should be located approximately 2,000 to 4,000 feet past the arrival threshold for general aviation and corporate jet aircraft. Based on the guidance provided by AC 150/5060-5 for runway exit factor, the VMC exit factor is 0.90 and the IMC exit factor is 1.00 for both east and west flow operations.

The AC shows that DVT's hourly runway capacity base is approximately 190 aircraft operations during VMC. Applying the 1.36 touch-and-go factor and the 0.90 runway exit factor, the adjusted hourly VMC capacity is 233 aircraft operations. *Figure 3-44* of the AC shows that DVT's hourly runway capacity base is approximately 70 operations during IMC. Applying the 1.00 touch-and-go factor and the 1.00 runway exit factor, the adjusted hourly capacity during IMC is 70 aircraft operations. These runway capacities are the maximum or ideal capacities that can be accomplished under optimal conditions. In practice, the actual runway capacity achieved will be less, and can often be in the range of 80% of the optimum capacity. However, for comparison with the ACRP methodology, the numbers produced by AC 150/5060-5 are carried forward.

The weighted runway capacity is a function of the different runway-use configurations used over the course of a year, the percent of time each runway-use configuration is used, the hourly capacity for each runway-use configuration, and the ASV weighting factor. The weighted capacity expression is:

$$c_w = \left(\frac{(p_1 \cdot c_1 \cdot w_1) + (p_2 \cdot c_2 \cdot w_2) + \cdots + (p_n \cdot c_n \cdot w_n)}{(p_1 \cdot w_1) + (p_2 \cdot w_2) + \cdots + (p_n \cdot w_n)} \right)$$

Where,

C_w = weighted hourly capacity
p_n = percent of time configuration "n" is used
c_n = hourly capacity of configuration "n"
w_n= ASV weighting factor (based on the percent of maximum capacity)

Since the west and east flow hourly capacities are approximately equivalent, only VMC and IMC operations are applied to the weighted capacity expression. The resultant weighted hourly capacity is approximately 230 aircraft operations. As presented in **Table 3-2**, the peak hourly demand in 2033 is projected to be 215 aircraft, which is less than the theoretical hourly capacity of the airfield. As previously stated, the airfield may not be able to achieve its theoretical maximum hourly capacity due to air traffic control constraints, variances in actual runway occupancy time, pilot actions, and many other external factors.

ASV is the mathematical multiplication of the weighted hourly capacity, the ratio of annual demand to average daily demand during the peak month, and the ratio of average daily demand to average peak hour demand during the peak month. The latter two metrics are taken directly from the Forecast. The average daily demand during the peak month in 2013 is approximately 1,241 operations per day. The operations total for 2013 was 363,352 operations. The ratio of annual demand to average daily demand during the peak month is 293 (363,352 ÷ 1,241). The ratio of average daily demand during the peak month to average peak hour demand during the peak month is 9.3 (1,241 ÷ 133). The resultant ASV using the methodology outlined in AC 150/5060-5 is 626,727 operations (230 x 293 x 9.3). The total forecast operational demand of 590,239 aircraft operations through 2033 is within the range of the ASV estimation.

3.2.1.2 ACRP Capacity Methodology

The ACRP spreadsheet method for estimating airfield capacity was developed with the goal to better calibrate hourly capacities to more realistic operating conditions that would be encountered with real-world ATC, pilot, and external constraints. Many of the inputs used in the AC 150/5060-5 calculation are required for input into the ACRP spreadsheet. The ACRP spreadsheet model has modernized options for selecting airfield layouts that best match the subject airport. These include dependencies on which runways are identified for mixed use (departures and arrivals on each runway) or segregated use (defining a runway primarily for departure or arrival only). Both of DVT's runways operate as mixed mode and can accommodate simultaneous arrival and departures under VMC. During IMC, the runways are dependent and cannot be used for simultaneous arrivals. Additional inputs that are broadly assumed under the AC 150/5060-5 calculation and directly taken into account in the ACRP spreadsheet model include arrival-arrival and departure-departure separations, arrival gap spacing buffer, departure hold buffer, runway occupancy time based on the weight class of each aircraft, and number of runway crossings. The peak hourly runway capacity estimated by the ACRP spreadsheet model using the fleet mix from 2013 is approximately 154 operations, which is less than the projected 2033 peak hourly demand of 215 operations. This will result in periods where the airfield exhibits some delay in accommodating peak demand. Utilizing the same ASV demand ratios discussed under the AC 150/5060-5 methodology, the ACRP spreadsheet model yields an ASV capability of approximately 451,300 operations. The ACRP projected ASV exceeds the 2023 annual demand; however, it does not meet the 2028 or 2033 annual demand.

3.2.1.3 Capacity Analysis Conclusions

An ASV is highly dependent on current aviation activity and layout of the airfield. DVT's ASV should be used only as a benchmark for operational characteristics and should be recalculated periodically. It is not intended to be identified as the maximum theoretical capacity of the airfield or as the trigger point for the development of additional airfield capacity. An FAA approved airfield and airspace simulation model, such as Simmod *PRO!*, may be used to better approximate the capacity of an airport at the outset of a major capacity enhancement project. The results of the two ASV methodologies demonstrate DVT's two runway system can accommodate a substantial amount of demand with limited operational constraints. The ACRP model's hourly throughput of 154 operations translates to a round-the-clock annual volume capacity of 1.35 million operations. The AC model's hourly throughput of 230 operations translates to a round-the-clock annual volume capacity of 2.01 million operations. In practice, DVT would never experience round-the-clock peak hourly demand, but the airfield has sufficient capability to accommodate the forecast annual operations through 2033 without additional runways. **Table 3-3** presents a summary of the two methodologies for peak hourly capacity and ASV.

Table 3-3: Peak Hourly Capacity and ASV Summary

Metric	ACRP Model	AC 150/5060-5 Model
2033 Aircraft Operations Demand	590,239 Ops	590,239 Ops
Hourly Capacity	154 Ops/Hr	230 Ops/Hr
Annual Service Volume	451,300 Ops	626,727 Ops

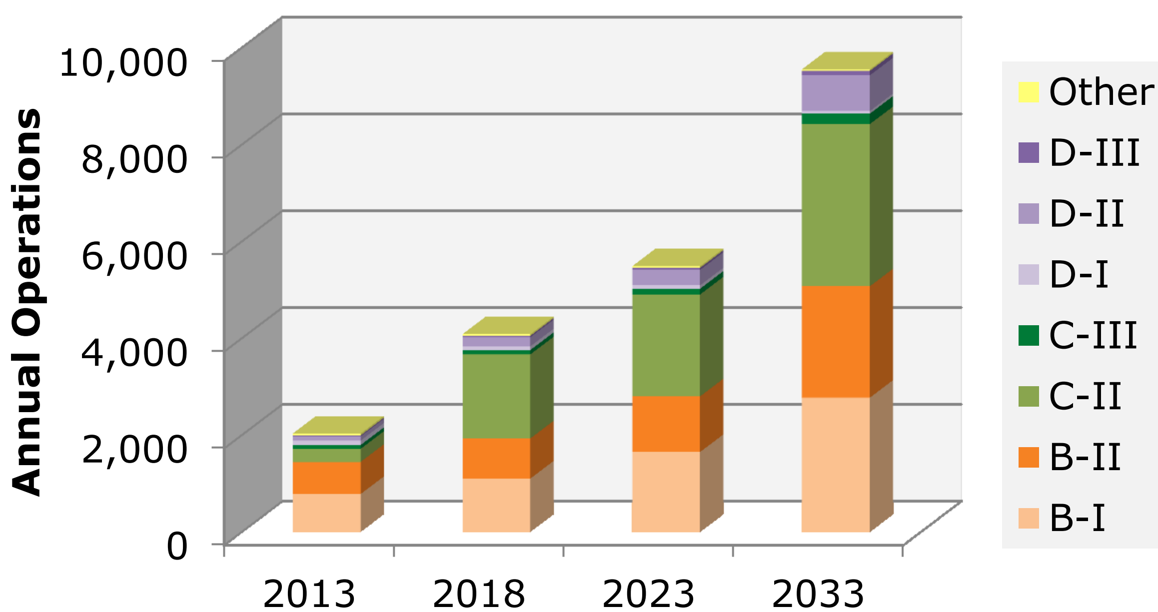
Source: HNTB Analysis

As demand grows, there will be peak periods where users experience arrival and departure delay. This is further exacerbated by the current demand placed on the south runway, Runway 7R-25L, which handles more than 60% of DVT's operations due to the number of facilities on the south side, tenants' locations, and preference for a longer runway. A better balancing of the utilization of the north and south runways would assist in mitigating some of the delay that will be experienced in future years. While not necessarily adding capacity to the airfield, an extension of Runway 7L-25R could assist in balancing the airfield by being able to accommodate a greater number of operations without weight restrictions. The relocation of high-volume tenants, such as the flight schools, to the north side of the airfield could also assist in balancing the utilization of the runways.

3.3 Critical Aircraft

The FAA defines the critical aircraft for an airport as the aircraft representing the combination of the most demanding ARC with greater than 500 annual operations at the airport. DVT's existing critical aircraft is the Challenger 604 (C-II). The Forecast estimates that the future critical aircraft will be the Gulfstream IV (D-II) by approximately 2028. **Figure 3-1** below depicts a summary of DVT's forecast jet fleet mix by ARC. Chapter 1, Inventory of Existing Conditions, introduced the components of the RDC: ADG, AAC and approach visibility minimum as well as the TDG. An RDC and TDG are designated for each runway on an airfield. The existing north runway's (Runway 7L-25R) RDC and TDG are B/I/VIS and 1A, respectively. The forecast RDC and TDG for the north runway are B/II/VIS and 1B, respectively. With the long-planned relocation of Taxiway B, Runway 7L-25R will meet B/II/VIS design standards. As such, it is also prudent to plan taxiways and their corresponding fillets to meet TDG 1B standards. Representative aircraft fitting into B-II include Beech King Air, Cessna Citation V, and Falcon 20. The existing south runway's (Runway 7R-25L) RDC and TDG are C/II/5000 and 1B, respectively. The forecast RDC and TDG for the south runway are D/II/5000 and 2, respectively. The change from C/II/5000 to D/II/5000 has minimal facility impacts but indicates an increase in medium sized business jets in the Forecast. **Table 3-4** summarizes DVT's existing and forecast RDCs and TDGs. The approach visibility minimum component is analyzed in Section 3.4.5 and in Chapter 5, Airport Alternatives, to assess whether lower approach visibility minimums is a viable improvement at DVT.

Figure 3-1: Jet Fleet Mix Forecast by ARC



Source: HNTB Analysis

Table 3-4: Runway and Taxiway Design

Runway	Existing RDC	Forecast RDC	Existing TDG	Forecast TDG
Runway 7R-25L	C/II/5000	D/II/5000	1B	2
Runway 7L-25R	B/I/VIS	B/II/VIS	1A	1B

Source: HNTB Analysis

3.4 Airfield Requirements

The airfield requirements presented in this section are a composite of quantitative requirements, many of which are discussed in AC 150/5300-13A, and qualitative requirements that will help the airfield further improve safety and operational efficiency.

3.4.1 Runway Geometry

The Forecast estimates that DVT's Runway 7R-25L will have an RDC D/II/5000 by the end of the planning horizon. **Table 3-5** presents and compares the existing Runway 7R-25L geometry with the requirements for runway design criteria for D/II/5000 and D/II/2400. An analysis for D/II/2400 has been included in addition to D/II/5000 in order to assess the impacts of lowering the approach visibility minimums from the existing 1.25 miles to a Category I Instrument Landing System (ILS) precision approach with 0.5 mile approach visibility.

Among the Runway 7R-25L geometry elements that do not meet current FAA design standards for RDC D/II/5000 are the blast pad width, which is deficient by 20 feet; the runway centerline to holdbar separation between Runway 7R-25L and Taxiway C, which is deficient by 100 feet; and runway shoulders, which are not present. To meet RDC D/II/2400 design standards, in addition to the geometry elements, Runway 7R-25L's centerline separation to Taxiway C's centerline would need to increase from 300 feet to 400 feet, the separation from the closest aircraft parking area to Runway 7R-25L's centerline would have to increase from 400 feet to 500 feet, and the arrival RPZ size would increase which potentially requires additional land acquisition/easement control.

Table 3-5: Runway 7R-25L Facility Requirements

Geometry Element RDC	Existing C/II/5000	Geometry Requirements D/II/5000	 D/II/2400	
Approach Visibility Minimum	1.25 mile	1.25 mile	0.5 mile	*
Runway Width	100'	100'	100'	
Runway Shoulder Width	0'	10'	10'	
Runway Blast Pad Width	100'	120'	120'	
Runway Blast Pad Length	152'	150'	150'	
Maximum Crosswind Component	16 knots	16 knots	16 knots	
RSA Width[1]	500'	500'	500'	
RSA Length Beyond Stop End	1,000'	1,000'	1,000'	
RSA Length Prior to Landing Threshold	600'	600'	600'	
ROFA Width	800'	800'	800'	
ROFA Length Beyond Stop End	1,000'	1,000'	1,000'	
ROFA Length Prior to Landing Threshold	600'	600'	600'	
ROFZ Width	400'	400'	400'	
ROFZ Length Beyond Stop End	200'	200'	200'	
Arrival RPZ Length	1,700'	1,700'	2,500'	*
Arrival RPZ Inner Width	500'	500'	1,000'	*
Arrival RPZ Outer Width	1,010'	1,010'	1,750'	*
Departure RPZ Length	1,700'	1,700'	1,700'	
Departure RPZ Inner Width	500'	500'	500'	
Runway Centerline to:				
Holdline	150'	250'	250'	
Parallel Taxiway/Taxilane Centerline	300'[2]	300'	400'	*
Aircraft Parking Area	400'	400'	500'	*

Source: FAA AC 150/5300-13A, Change 1 and HNTB analysis

*: Indicates a difference in requirements between D/II/5000 and D/II/2400.

Note 1: For Airport Reference Code C-I, C-II, and D-II a RSA Width of 400' is Permissible (AC 150/5300-13A, Table 3-5).

Note 2: The existing runway centerline to taxiway centerline separation from Taxiways C and B are 300' and 500', respectively.

Similar to Runway 7R-25L, Runway 7L-25R's existing airfield geometry is compared with the airfield design for RDCs B/I/VIS and B/II/VIS in **Table 3-6**. The runway currently does not fully comply with RDC B/I/VIS standards as it does not have a runway blast pad and Taxiway B does not meet separation standards as it is only 200 feet from Runway 7L-25R's centerline and is required to be a minimum of 225 feet.

Compared to RDC B/II/VIS, Runway 7L-25R is further deficient in blast pad width and length. In addition, separation distance between Runway 7L-25R and Taxiway B would need to increase to a minimum of 240 feet. The runway's RSA, OFA, and OFZ are already graded to support B/II/VIS standards; however, they are currently only identified to meet B/I/VIS.

Table 3-6: Runway 7L-25R Facility Requirements

Geometry Element RDC	Existing B/I/VIS	Geometry Requirements B/I/VIS	 B/II/VIS	
Approach Visibility Minimum	1.25 mile	1.25 mile	1.25 mile	
Runway Width	75'	60'	75'	*
Runway Shoulder Width	10'	10'	10'	
Runway Blast Pad Width	0'	80'	95'	*
Runway Blast Pad Length	0'	100'	150'	*
Maximum Crosswind Component	10.5 knots	10.5 knots	13 knots	*
RSA Width	120'	120'	150'	*
RSA Length Beyond Stop End	240'	240'	300'	*
RSA Length Prior to Landing Threshold	240'	240'	300'	*
ROFA Width	400'	400'	500'	*
ROFA Length Beyond Stop End	240'	240'	300'	*
ROFA Length Prior to Landing Threshold	240'	240'	300'	*
ROFZ Width	250'	250'	400'	*
ROFZ Length Beyond Stop End	200'	200'	200'	
Arrival RPZ Length	1,000'	1,000'	1,000'	
Arrival RPZ Inner Width	500'	500'	500'	
Arrival RPZ Outer Width	700'	700'	700'	
Departure RPZ Length	1,000'	1,000'	1,000'	
Departure RPZ Inner Width	500'	500'	500'	
Runway Centerline to:				
Holdline	200'	200'	200'	
Parallel Taxiway/Taxilane Centerline	300'[1]	225'	240'	*
Aircraft Parking Area	365'	200'	250'	*

Source: FAA AC 150/5300-13A, Change 1 and HNTB analysis

*: Indicates a difference in requirements between B/I/VIS and B/II/VIS.

Note 1: The existing runway centerline to taxiway centerline separation from Taxiways A and B are 300’ and 200’, respectively.

3.4.2 Additional Runway Requirements

3.4.2.1 Runway Length

Runway length requirements are dependent upon aircraft type and maximum takeoff weight (e.g. aircraft, passengers, baggage, cargo, fuel), runway elevation, runway grade, conditions and obstructions, air temperature, and wind.

The runway takeoff length requirements in this analysis were reviewed based on weather conditions associated with a warm, summer day (“hot day”), which result in longer runway takeoff length requirements than on a typical day. **Figure 3-2** presents the takeoff length requirements at 105° F (an average day in July) for a variety of aircraft in DVT’s current and future fleet mix as well as a sampling of other aircraft that DVT could expect on an infrequent basis (Boeing 737 [Boeing Business Jet], Gulfstream V, etc). The graphic illustrates the runway takeoff length requirement for the fleet at various percentages of maximum takeoff weight (80%, 90%, and 100%). The percentages of maximum takeoff weight are shown to demonstrate at what percentage of maximum payload a given aircraft can operate at DVT. The runway takeoff length requirement at maximum takeoff weight for a Gulfstream IV, DVT's future critical aircraft, is 8,153 feet. The Gulfstream IV is able to depart with 100% payload from DVT's Runway 7R-25L, which is currently 8,196 feet long.

The current and forecast fleet can operate at DVT largely without weight penalties even during the warmest months (June through September). It is important to note that even during the warmest months 100% of the small propeller-driven fleet is able to takeoff from Runway 7L-25R, which is currently 4,500 feet long. However, due its comparative length, pilots are not always willing to accept assignment on Runway 7L-25R. The ability to accommodate the departure length for the entire propeller-driven fleet, which encompasses the vast majority of the operations at DVT, will be important as this Master Plan strives to balance the distribution of activity between the two runways. Aircraft landings require less runway length. Generally, corporate jet insurance companies recommend that there is a minimum of 5,000 feet available for jet aircraft arrivals. Propeller-driven aircraft generally need less than 4,000 feet for arrivals.

The existing runway lengths are sufficient to accommodate the projected aircraft fleet mix's departure and arrival length requirements through the planning horizon, however, to better balance the airfield, an extension of the north runway would allow enhanced flexibility for ATC to utilize the runways and allow some jet departures and arrivals on the north runway should there be peak periods of very high traffic volume, or should there be an incident that temporarily closes Runway 7R-25L. This would provide increased operational efficiency on the airfield and an increase in overall airfield capacity as there could be less runway crossings as aircraft could utilize the runway closest to their parking area.

3.4.2.2 Pavement Strength

Chapter 1, Inventory of Existing Conditions, summarized the runway pavement bearing strengths for each runway (see **Table 1-7**). **Table 3-7** provides the maximum takeoff weight and landing gear configuration of a sampling of DVT's current and projected fleet mix.

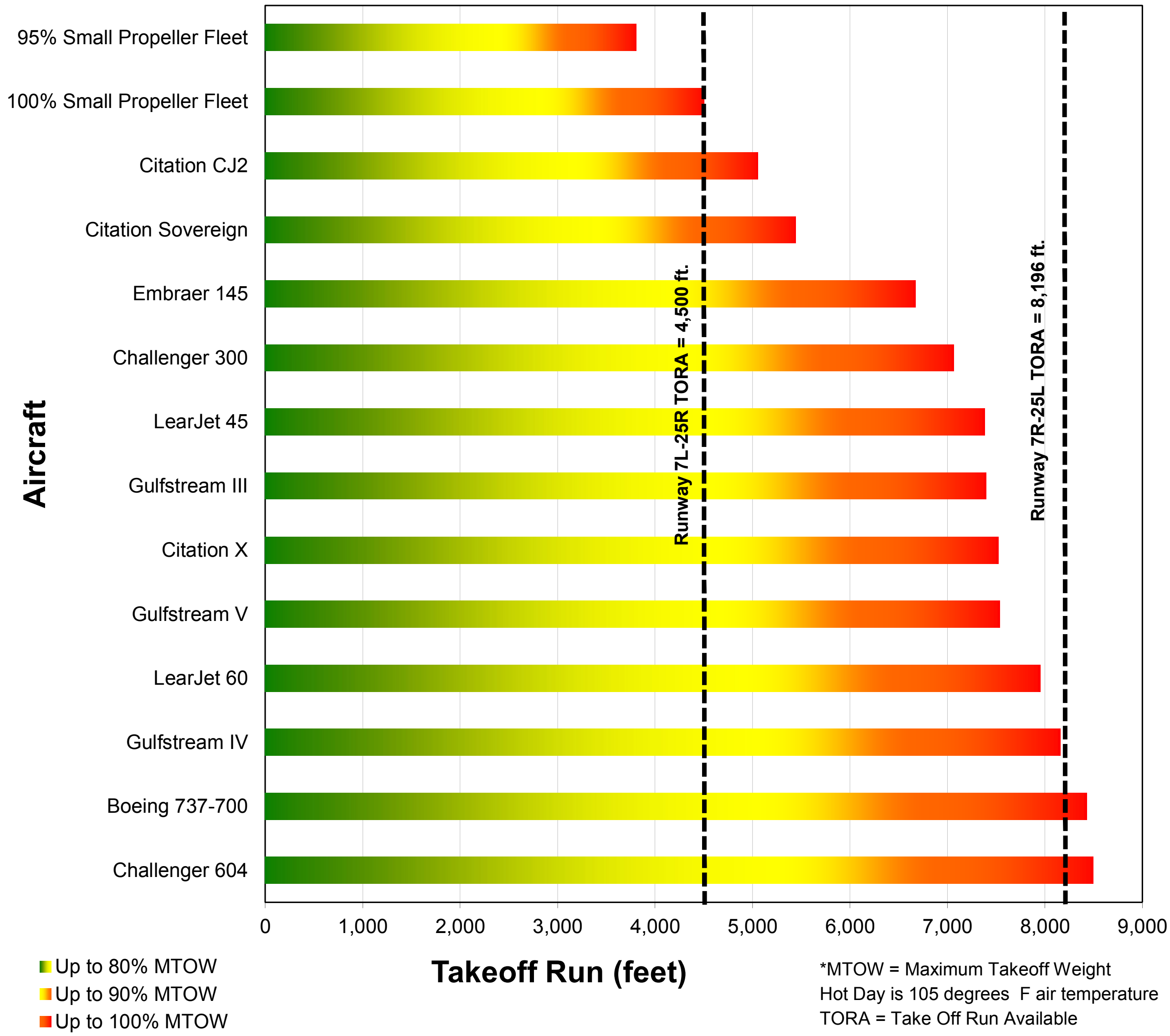
Table 3-7: Select Aircraft Pavement Bearing Strength Requirements

Aircraft	Maximum Takeoff Weight	Landing Gear Configuration
Beech King Air C90	10,100 Lbs.	Single Wheel
Citation X	36,100 Lbs.	Double Wheel
Challenger 604	48,200 Lbs.	Double Wheel
Gulfstream IV	74,600 Lbs.	Double Wheel
Gulfstream V	90,500 Lbs.	Double Wheel
Boeing Business Jet I	171,000 Lbs.	Double Wheel

Source: Various aircraft manufacturer's design manuals and Applied Pavement Technology, DVT Final Report, 2014

Note: Runway 7R-25L Single Wheel bearing strength: 65,000 Lbs., Double Wheel bearing strength: 93,000 Lbs.; Runway 7L-25R Single Wheel bearing strength: 119,000 Lbs., Double Wheel bearing strength: 186,000 Lbs.

DVT Runway Departure Length Analysis (Hot Day Conditions)



*MTOW = Maximum Takeoff Weight
Hot Day is 105 degrees F air temperature
TORA = Take Off Run Available

Percentage of Forecast Operations by Aircraft Type (2033)

Aircraft Type	%	Aircraft Type	%
95% Small Propeller Fleet	83.77	Gulfstream III	< 0.01
100% Small Propeller Fleet	88.18	Citation X	0.01
Citation CJ2	0.03	Gulfstream V	0.01
Citation Sovereign	0.01	LearJet 60	< 0.01
Embraer 145	0.01	Gulfstream IV	0.12
Challenger 300	0.26	Boeing 737-700	< 0.01
LearJet 45	0.03	Challenger 604	0.21

Percentage of forecast operations is derived from the Aviation Activity Forecast. The percentages are based on a total of 590,239 operations forecast for 2033.

Source: HNTB Analysis

Runway Takeoff Length Requirements

Figure 3-2

DVT

HNTB

The aircraft that are forecast to regularly operate at DVT all fall within the runway pavement bearing strengths of the airfield. The Boeing Business Jet I (737-700) exceeds the runway pavement double wheel bearing strength of 93,000 Lbs. for Runway 7R-25L, the runway that it would likely depart on due to the length and width of the runway; however, only 11 operations were recorded for that aircraft type in 2013. When a runway pavement bearing strength is exceeded by an aircraft's weight, it does not imply that the aircraft cannot use that runway or that the aircraft using that runway will cause immediate distress to the runway. Occasional usage by aircraft should not significantly impact the lifespan of runway pavement; however, regular operations of overweight aircraft will increase the rate at which a runway would need rehabilitation.

3.4.3 Runway Safety Action Plan

FAA's design advisory circular, AC 150/5300-13A, consolidates a variety of recent research findings related to airfield safety. Previously airfield safety enhancement bulletins had been published in FAA orders and engineering briefs. The research correlates existing design geometries with incursion history as well as the future potential for an incursion to take place. The FAA found that there are specific trends in airfield geometry that can result in incursions and have broadly identified them as:

- Complex runway intersections – Pilots can get confused on the airfield if there are too many decision points
- Runways beginning near the intersection of a crossing runway – Pilots could mistakenly takeoff or land on the wrong runway
- "High energy intersections" – Aircraft should not have runway crossing points in the middle 1/3 of the runway to provide enhanced pilot situational awareness
- Misaligned runway arrival thresholds – Pilots may misidentify a runway as a taxiway or vise-versa
- Complex taxiway intersections with greater than 2 intersecting paths – Pilots could mistakenly traverse the wrong taxiway
- Extra-wide taxiway pavements – Signage potentially could be too far out of view for pilots
- Runway crossings that lead directly into a ramp – Pilots could mistakenly cross a runway without being cleared
- Direct runway crossings from an adjacent runway – After landing pilots could mistakenly continue their taxi path in front of an aircraft landing or departing an adjacent runway
- Entrance taxiways to runways– Pilots approaching a runway sometimes mistakenly line up for approach on the parallel taxiway. Rounding out the entrance taxiway to a runway visually enhances both the taxiway and runway
- Runway/taxiway and taxiway/taxiway intersections – Right angles provide the best visibility left and right for a pilot at an intersection

3.4.3.1 Hot Spots

The FAA identifies Hot Spots at every airport. The FAA defines a hot spot as a location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary. There are two official Hot Spots at DVT.

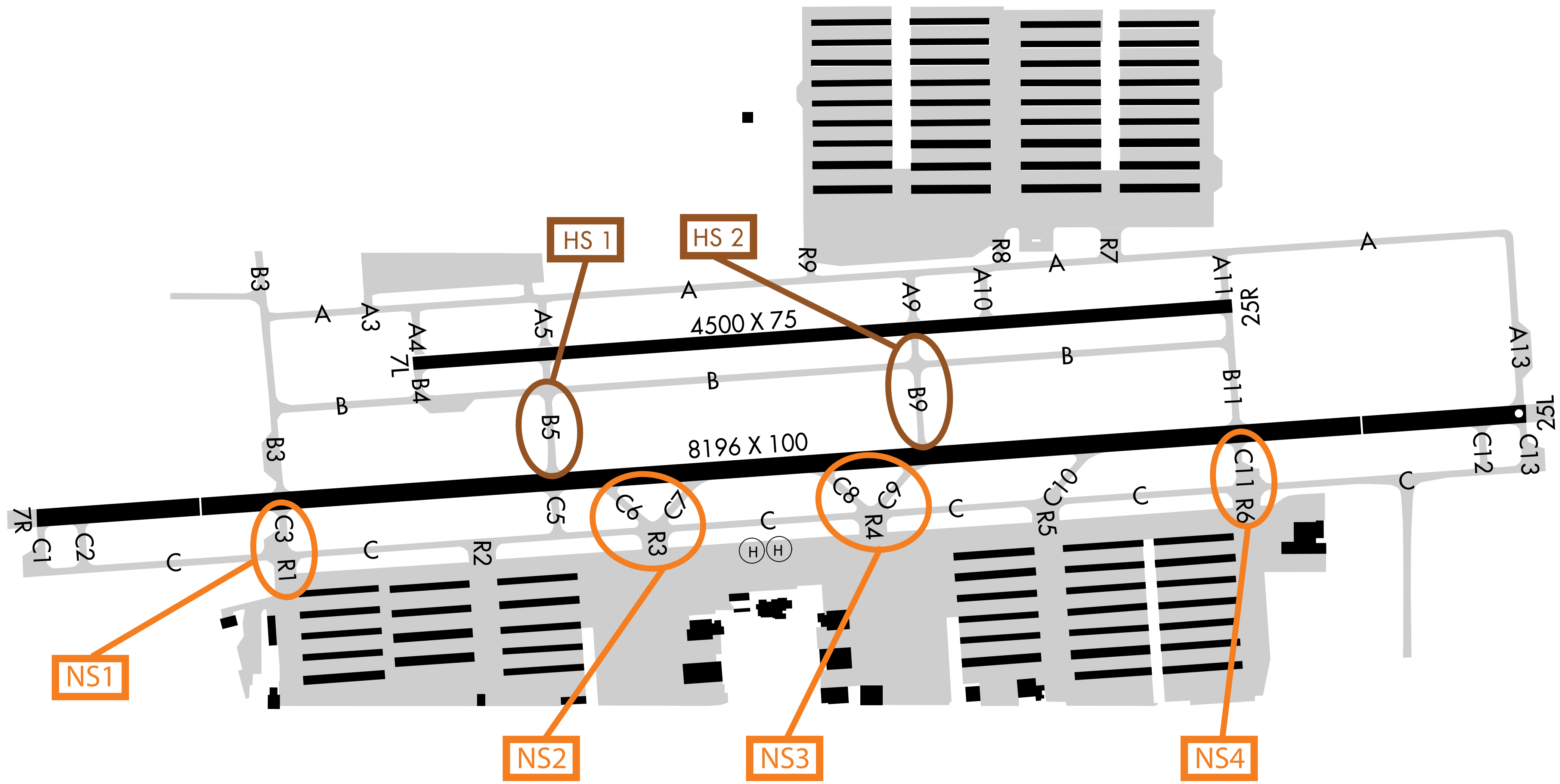
- **Hot Spot 1** is located along Taxiway B5 between Taxiway B and Runway 7R-25L. Historically, some pilots have crossed Runway 7R-25L at Taxiway B5 without ATC clearance. This is an example of a straight through runway crossing without an impediment.
- **Hot Spot 2** is located along Taxiway B9 between Runways 7L-25R and Runway 7R-25L. Historically, some pilots have crossed Runway 7R-25L at Taxiway B9 without ATC clearance.

The Hot Spots are depicted in **Figure 3-3** along with the nonstandard geometry intersections described below.

3.4.3.2 Nonstandard Geometry

In addition to the FAA Hot Spots, there are additional taxiway intersections that do not meet current FAA AC 150/5300-13A guidelines and have the potential for incursions. The nonstandard geometry locations are described in the bullets below. Proposed updates to the airfield geometry to address these intersections are discussed in Chapter 5, Airport Alternatives. These intersections are also depicted in **Figure 3-3**.

- **Nonstandard Geometry 1** is located along Taxiway C3 between Runway 7R-25L and the non-movement area. Aircraft leaving the non-movement area can taxi directly beyond Taxiway C and onto Runway 7R-25L without an impediment. This intersection is critical because it is a primary access point to the north runway. The pavement width also exceeds recommended FAA guidelines.
- **Nonstandard Geometry 2** is located at the intersection of Taxiways C6, C7, C, and the non-movement area. This five-node intersection point exceeds the FAA's recommendation for a maximum of four taxiway nodes. The pavement width exceeds recommended FAA guidelines.
- **Nonstandard Geometry 3** is located at the intersection of Taxiways C8, C9, C, and the non-movement area. This five-node intersection point exceeds the FAA's recommendation for a maximum of four taxiway nodes. The pavement width exceeds recommended FAA guidelines.
- **Nonstandard Geometry 4** is located along Taxiway C11 between Runway 7R-25L and the non-movement area. Aircraft leaving the non-movement area can taxi directly beyond Taxiway C and onto Runway 7R-25L without an impediment. This intersection is critical because it is a primary access point to the departure end of the north runway. The pavement width exceeds recommended FAA guidelines



- Hot Spot 1 is located along Taxiway B5 between Taxiway B and Runway 7R-25L. Historically, some pilots have crossed Runway 7R-25L at B5 without ATC clearance.
- Hot Spot 2 is located along Taxiway B9 between Runways 7L-25R and Runway 7R-25L. Historically, some pilots have crossed Runway 7R-25L at B9 without ATC clearance.
- Non-standard Geometry 1 is located along Taxiway C3 between Runway 7R-25L and the non-movement area. Aircraft leaving the non-movement area can taxi directly beyond Taxiway C and onto Runway 7R-25L without an impediment. This intersection is critical because it is a primary access point to the north runway. The pavement width exceeds recommended FAA guidelines.
- Non-standard Geometry 2 is located at the intersection of Taxiways C6, C7, C, and the non-movement area. This five-node intersection point exceeds the FAA's recommendation for a maximum of four taxiway nodes. The pavement width exceeds recommended FAA guidelines.
- Non-standard Geometry 3 is located at the intersection of Taxiways C8, C9, C, and the non-movement area. This five-node intersection point exceeds the FAA's recommendation for a maximum of four taxiway nodes. The pavement width exceeds recommended FAA guidelines.
- Non-standard Geometry 4 is located along Taxiway C11 between Runway 7R-25L and the non-movement area. Aircraft leaving the non-movement area can taxi directly beyond Taxiway C and onto Runway 7R-25L without an impediment. This intersection is critical because it is a primary access point to the departure end of the north runway. The pavement width exceeds recommended FAA guidelines.

DVT Hot Spots and Non-standard geometry

Figure 3-3

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3.4.4 Taxiway Requirements

Taxiway requirements are largely based on the TDG criteria presented in AC 150/5300-13A, Change 1 as well as qualitative operational observations of the taxiways. Similar to the runway geometry analysis, a taxiway geometry analysis comparison was prepared for the taxiways supporting Runway 7R-25L (**Table 3-8**) and Runway 7L-25R (**Table 3-9**).

Table 3-8: Runway 7R-25L TDG Requirements

Geometry Element	Existing	Required
TDG	1B	2
Taxiway Width	35’-40’	35'
Taxiway Shoulder Width	0'	15'
Taxiway Edge Safety Margin	7.5'	7.5'
Taxiway Centerline to:		
Parallel Taxiway/Taxilane Centerline	157'	105'
Fixed or Moveable Object	65.5'	65.5'
Taxiway Safety Area Width	79'	79'
Taxiway Object Free Area Width	131'	131'
Taxiway Wingtip Clearance	26'	26'
Taxilane Centerline to:		
Parallel Taxilane Centerline	116'	97'
Fixed or Moveable Object	50'	57.5'
Taxilane Object Free Area Width	115'	115'
Taxilane Wingtip Clearance	18'	18'

Source: FAA AC 150/5300-13A, Change 1 and HNTB analysis

Table 3-9: Runway 7L-25R TDG Requirements

Geometry Element	Existing	Required
TDG	1A	1B
Taxiway Width	35'	25'
Taxiway Shoulder Width	10'	10'
Taxiway Edge Safety Margin	5'	5'
Taxiway Centerline to:		
Parallel Taxiway/Taxilane Centerline	85'	105'
Fixed or Moveable Object	65.5'	65.5'
Taxiway Safety Area Width	49'	79'
Taxiway Object Free Area Width	89'	131'
Taxiway Wingtip Clearance	20'	26'
Taxilane Centerline to:		
Parallel Taxilane Centerline	114'	97'
Fixed or Moveable Object	39.5'	57.5'
Taxilane Object Free Area Width	79'	115'
Taxilane Wingtip Clearance	15'	18'

Source: FAA AC 150/5300-13A, Change 1 and HNTB analysis

The majority of DVT's taxiways meet FAA design standards for separations and widths. The main deficiency is the lack of taxiway shoulders on Taxiway C and the Runway 7R-25L entrance/exit taxiways. Rather than asphalt paved shoulders, Taxiway A has 10 foot milled shoulders on each side. Having milled shoulders as opposed to asphalt paved shoulders is a considerable cost saving measure.

In addition to the requirements identified in AC 150/5300-13A, there are a number of qualitative improvements that are recommended for the taxiway system. These include the following:

In order to meet a minimum RDC of B/II/VIS, it is recommended that Taxiway B be relocated from 200 feet from Runway 7L-25R centerline to 300 feet from Runway 7L-25R centerline. The relocation of the Taxiway B would provide the same runway to taxiway separation (300 feet) that Taxiway A was recently constructed to meet. If Taxiway B is relocated, there is an opportunity to further improve the taxiway geometry between the two runways by reconfiguring runway crossing points so they do not align with entrances to aircraft parking aprons and runway crossings are eliminated from the middle third of the runway.

The addition of a second parallel taxiway on the south side of the airfield would help accommodate the heavy traffic flow of inbound and outbound aircraft currently mixing on Taxiway C. The current location of the runway holdbars south of Runway 7R-25L does not meet standards. If the holdbars were relocated from their existing location of 150 feet south of Runway 7R-25L to the FAA-standard location of 250 feet, it would require arriving aircraft to immediately exit the runway onto Taxiway C as there would be insufficient length for aircraft to hold between the Runway 7R-25L RSA and the Taxiway C OFA. A second parallel taxiway would enable departures and arrivals to be segregated on two taxiways which would allow arriving aircraft to immediately exit the runway without having additional congestion from departing aircraft traversing Taxiway C. A second parallel taxiway would also allow enhanced sequencing of aircraft as there would be a bypass route for aircraft to taxi around other aircraft holding on the taxiway. Near the departure ends of the runway, this also allows jet and small general aviation departure traffic to be segregated which could help reduce potential jet blast impacts.

The FAA hot spots and other nonstandard geometry require mitigation to further improve safety and to minimize the potential risk for incursions. The latest edition of AC 150/5300-13A incorporates many recommendations from the FAA's research on reducing airfield incursions. Major recommendations include minimizing runway crossings, providing impediments prior to crossing multiple runways, arrival threshold alignment among parallel runways, enhancing visual cues, consistent marking and signage, and reducing complex taxiway and runway intersections.

With both flight schools located on the south side of the airfield, there are several peaks throughout the day where greater than 6 aircraft taxi out of the ramp and head to the departure end of the south runway at the same time. The existing run-up aprons at C1, C3, C11, and C13 are large enough to hold approximately two small general aviation aircraft at each location; however, all of the existing run-up aprons are contained within the RSA. Once the runway holdbars south of Runway 7R-25L are relocated to their required distance, these run-up aprons will not be able to be used. Furthermore, they are currently undersized and do not meet dimensional requirements outlined by the FAA. Larger run-up areas adjacent to each runway end that are outside of the RSA and below any approach and departure surfaces would better serve the operation. Given the frequency and demand for a run-up position from small general aviation aircraft, there should be a minimum of six positions at each end of the runway. A new, larger run-up apron designed to FAA standards would not only improve the congestion at each end of the runway, but would also improve ATC's ability to sequence aircraft.

3.4.5 NAVAIDs

The existing NAVAIDs at DVT support non-precision instrument arrivals. The previous Master Plan reviewed the ability for DVT to upgrade its approach to a precision instrument runway using a Category I ILS approach complete with a glideslope, localizer, and medium intensity approach lighting system with runway alignment indicator lights (MALSR). The NAVAID improvements recommended in the previous Master Plan would bring the approach visibility minimums for Runway 25L down to 0.5 mile (currently 1.25 miles). The meteorological conditions at DVT do not justify the installation of an ILS alone as the frequency of IFR conditions is less than 2% of the year. The intended purpose of an ILS at an airport with substantial flight training activity like DVT would be to provide instruction and recurrent training for pilots. The implementation of an ILS has physical airfield impacts as well as collateral impacts. Amongst DVT's users and tenants, there is a perceived lack of available ILS training sites within the Greater Phoenix Metropolitan area. The lack of available training sites would likely induce additional demand for aircraft from across the Phoenix area to practice approaches at DVT. The additional traffic could further congest the airspace at and between training sites.

As discussed in the runway geometry section, an ILS with 0.5 mile visibility would increase the required runway to taxiway separation from 300 feet to 400 feet. This would require the relocation and reconstruction of Taxiway C and would preclude the ability to construct a parallel taxiway within airport property. The off-airport RPZ impacts would also result in additional mitigation. The RPZ associated with a precision instrument approach is significantly longer and wider than the existing RPZ. The resultant RPZ would require off-airport property acquisition to maintain control of the property contained within the RPZ. Further analysis would also be required to verify that any approach would be clear of controlling obstacles. While still impactful, it is possible to have an ILS approach without a MALSR, which would translate to an approach with visibility minimums as low as 0.75 mile. At 0.75 mile approach visibility minimum, the runway to taxiway separation requirements are only 300 feet and the RPZ size is not as large as the lower visibility RPZ. Even with a 0.75 mile visibility approach minimum, the induced demand for shooting practice approaches would result in adverse delay impacts to DVT and would likely reduce overall capacity of the airfield because aircraft flying an ILS approach have greater final approach separations. Tenant and user reaction to the implementation of an

ILS has been mixed, however, the majority of tenants and users prefer that the ILS be located at an airport with less activity.

As the Next Generation (NEXTGEN) Air Transportation System continues to progress and technology continues to improve, GPS approaches will have approach visibility minimums comparable with existing ILS approaches. Many of these GPS approaches, such as LPV approaches and other Required Navigation Performance (RNP) procedures, can provide similar training opportunities for general aviation aircraft and adequate stabilized approach requirements for many corporate aircraft.

With regard to visual NAVAIDs, each of DVT's four existing PAPI visual slope indicators are two light systems. Two light systems indicate whether a pilot is above or below the runway's glide path angle. A four light system conveys to pilots additional relative information about the glide path including whether the pilot is marginally above/below the glide path angle or substantially above/below the glide path angle. Four-light PAPIs enhance pilot situational awareness on an approach and increase overall safety. It is recommended that DVT's two light PAPIs be replaced with four light PAPIs.

Tenant and user surveys have overwhelmingly recommended the reestablishment of a compass calibration pad at DVT. The former compass calibration pad was demolished as the northwest apron was reconstructed and reconfigured. A compass calibration pad allows pilots to calibrate their magnetic compass using surveyed magnetic headings painted on the ground. The siting criteria for a compass calibration pad are described in Appendix 6 of AC 150/5300-13A, Change 1. Chapter 5, Airport Alternatives, further explores the viability of siting a compass calibration pad at DVT.

3.4.6 Airfield Lighting, Marking and Signage

The existing airfield lighting (runway lighting, taxiway lighting, runway end identifier lights) meets the future needs of DVT provided an ILS approach is not implemented. Should an ILS approach be implemented, the runway and taxiway edge lighting would be required to be upgraded to high-intensity runway and taxiway edge lighting. Many airports are also now upgrading existing runway and taxiway lighting to light emitting diode (LED) lighting which has a superior service life over existing systems. LED lighting also uses less power than other contemporary lighting systems.

DVT's two runways will soon need to be re-designated to 8L-26R and 8R-26L due to magnetic declination. Magnetic declination is the angle between magnetic north and true north. Earth's magnetic north is constantly moving, and as a result, the magnetic headings of the runways are changing as well. By early 2016, DVT's runways designators will be eligible to be changed to 8-26s. The eligibility to change to 8-26 does not mean there is an immediate requirement to re-designate the runways. As there are a lot of impacts to re-designating the runways, including changing all publications, amending flight procedures, and modifying signage and marking on the ground, the re-designation should be implemented at a time when other significant construction projects are planned. An ILS would require the runway markings to be upgraded to precision markings and there could potentially be some ILS hold areas that would need to be marked to protect aircraft and vehicles from interfering with the ILS signals.

3.5 General Aviation Facilities

General aviation facility requirements include shade hangars, t-hangars, box hangars, apron tie-downs, and terminal services.

3.5.1 Hangars

There are three primary types of hangars at DVT: shade hangars, t-hangars and box hangars. Shade hangars are the most cost-effective of the three options. DVT has 12 shade hangar buildings accommodating 240 aircraft parking positions. Shade hangars have a fairly high vacancy rate compared to the other hangar options. DVT offers two sizes of t-hangars (large and small). Both sizes of t-hangars currently have a wait list for availability with large t-hangars in greater demand. DVT has a total of 58 t-hangar buildings accommodating 768 aircraft parking positions. Box hangars typically house larger aircraft and corporate/business aircraft. DVT has 11 on-airport box hangar buildings. Box hangar development is largely driven by increases in corporate / business jet traffic. Facility requirements have been prepared for each of the three types of hangars. The requirements take into account the role that each hangar type will play in the future. The analysis assumes that t-hangars will continue to be the most in-demand hangar type at DVT with shade hangar demand growing at a significantly slower pace. T-hangar and shade hangar demand are both correlated to the number of based aircraft. Box hangars have a stronger correlation to the volume of transient aircraft, especially jet aircraft. The facility requirements for shade hangars, t-hangars, and box hangars are presented in **Tables 3-10**, **3-11**, and **3-12**, respectively.

By the end of the planning horizon, there is a combined hangar building area deficiency of nearly 1,000,000 square feet, with nearly two-thirds being t-hangar building area. The demand for general aviation t-hangars will continue to grow. Modest growth in shade hangars is also expected near the end of the planning horizon as there are currently significant vacancies at the various shade hangars. The corporate jet community will continue to grow at DVT, and as a result, box hangar requirements are expected to grow substantially.

Table 3-10: Shade Hangar Requirements

Shade Hangars	2013	2018	2023	2028	2033
Shade Hangar Building Area Required (ft^2)	154,988	172,507	194,918	223,800	256,787
Existing Shade Hangar Building Area (ft^2)	221,411	221,411	221,411	221,411	221,411
Surplus / Deficiency (ft^2)	66,423	48,904	26,493	(2,389)	(35,376)

Source: HNTB Analysis

Table 3-11: T-Hangar Requirements

T-Hangars	2013	2018	2023	2028	2033
T-Hangar Building Area Required (ft^2)	964,500	1,073,522	1,212,991	1,392,724	1,598,006
Existing T-Hangar Building Area (ft^2)	952,952	952,952	952,952	952,952	952,952
Surplus / Deficiency (ft^2)	(11,548)	(120,570)	(260,039)	(439,772)	(645,054)

Source: HNTB Analysis

Table 3-12: Box Hangar Requirements

Box Hangars	2013	2018	2023	2028	2033
Box Hangar Building Area Required (ft^2)	113,579	208,726	267,257	350,258	459,062
Existing Box Hangar Building Area (ft^2)	161,317	161,317	161,317	161,317	161,317
Surplus / Deficiency (ft^2)	47,738	(47,409)	(105,940)	(188,941)	(297,745)

Source: HNTB Analysis

3.5.2 Aircraft Parking Apron

Aircraft parking apron requirements are based on a combination of factors, including projected volume of flight training, transient operations, and based operations. The facility requirements for aircraft parking aprons are presented in **Tables 3-13**. By the end of the planning period, there is a projected deficiency of approximately 667,000 square feet of aircraft parking apron.

Table 3-13: Aircraft Parking Apron Requirements

Parking Apron	2013	2018	2023	2028	2033
Aircraft Parking Apron Area Required (ft^2)	1,167,366	1,265,065	1,424,021	1,643,461	1,896,209
Existing Aircraft Parking Apron Area (ft^2)	1,228,806	1,228,806	1,228,806	1,228,806	1,228,806
Surplus / Deficiency (ft^2)	61,440	(36,259)	(195,215)	(414,655)	(667,403)

Source: HNTB Analysis

3.5.3 Helicopter Operations

DVT's local helicopter operations are currently handled by the FBOs and the Police Air Support Unit from their ramps. No additional dedicated helicopter landing areas or helipads exist on airport property. The majority of DVT's helicopter activity is from itinerant training operations from other regional airports. DVT could benefit from a dedicated helicopter training area located clear of the runways and main taxiways to reduce congestion and delay impacts to fixed-wing aircraft on approach/departure.

3.5.4 General Aviation Terminal Services

The Terminal is located on the south side of DVT and provides a range of services and amenities to pilots, tenants, and the community. To accommodate the vast number of tenants on the north side of the airfield, tenants and users have recommended the development of a small-scale terminal complete with a pilot lounge and restrooms. A north side terminal with those amenities could be accommodated in a relatively small building. It is recommended that the alternatives consider a suitable area for the implementation of a north side terminal or pilot's lounge.

3.6 Vehicle Access and Parking

3.6.1 Airport Access

As discussed in the inventory, DVT has two primary vehicular access points: a south entrance at Deer Valley Road and 7th Avenue and a north entrance at Airport Boulevard accessed from 7th Street. Currently no direct access is available from Pinnacle Peak Road to the FAA ATCT and north t-hangar facility. All vehicles arriving from the east or west must use Pinnacle Peak or Deer Valley roads to access 7th street which intersects Airport Boulevard providing local access to these north parcels.

Since the completion of the section of Pinnacle Peak Road between 19th Avenue and 7th Street north of DVT, the City has considered options to add a new north access point. With development of property on the north side of the airfield, access from the north will become increasingly critical. The two primary options consist of alignments along 7th Avenue and 3rd Avenue. An 850 foot long, 23 foot wide segment of 7th Avenue was recently constructed to connect Pinnacle Peak Road with the FedEx Ground Facility. This alignment could be widened by 17 feet (providing a minimum street width of 40 feet) and extended 450 feet to connect directly with the north-south alignment of Airport Boulevard providing access directly into the ATCT. The 3rd Avenue alignment right-of-way is owned by the City and if developed would connect to the mid-point of the north t-hangar development.

In 1985, the City purchased approximately 177 acres of property from the State of Arizona on the north side of the airfield and the existing north t-hangar development was subsequently constructed. As part of the deed transfer a 150-foot wide easement was stipulated to protect for taxiway access to the property bounded by the north airport property line and Pinnacle Peak Road allowing for future through-the-fence access to DVT. However, more recent FAA guidelines discourage through-the-fence agreements. Since 1985, additional land has been acquired on the north side of the airfield which could potentially be used for aviation business with a need for airfield access. The need and specific location for this easement, current FAA guidelines concerning through-the-fence operations, and the easement's influence of north side vehicle access options from Pinnacle Peak Road is considered in the alternatives development.

As more facilities are developed on the north, access from Pinnacle Peak Road will become increasingly critical. Options for this access point along with the taxiway easement will be reviewed as part of the alternatives development. The south airport access point sufficiently accommodates uses on the south but potential improvements associated with the location of proposed facilities will be reviewed as part of the alternatives development.

3.6.2 General Aviation Automobile Parking

Automobile parking requirements for DVTs general aviation facilities were calculated. The AZSAS set facility objectives for airports in Arizona. The objective for DVT as a reliever airport is to provide parking spaces for the equivalent of 75% of the based aircraft fleet. Although this is a high percentage compared to industry standards it accounts for parking at the terminal building for employees and visitors along with spaces for flight school students who do not utilize the shuttle service.

Currently DVT has 361 parking spaces adjacent to the terminal, FBOs and flight schools. Another 757 spaces are located at the t-hangar facilities for a total of 1,118 parking spaces, not including parking areas adjacent to individual facilities such as the ATCT, Police Air Support Unit facility or other individual buildings located throughout DVT. The overall number of general aviation parking spaces required at DVT per the AZSAS methodology is shown in **Table 3-14**. The requirement calculation shows a deficiency of parking spaces by 2028 and currently the terminal area has periods where there is a shortage of parking spaces. The future location of parking spaces will be addressed with the recommended plan as the relocation of some facilities on the south side of the airfield will also result in a redistribution of parking demand.

Table 3-14: DVT General Aviation Automobile Parking Summary (spaces)

Automobile Parking	2013	2018	2023	2028	2033
Based Aircraft	1,033	1,167	1,329	1,538	1,780
Parking Spaces Required	775	875	997	1,154	1,335
Existing Parking Spaces	1,118	1,118	1,118	1,118	1,118
Surplus / Deficiency	343	243	121	(36)	(217)

Source: HNTB Analysis

3.7 Support Facilities

3.7.1 Police Air Support Unit

The existing City of Phoenix Police Air Support Unit building and associated aircraft/helicopter apron is in poor condition. The building has surpassed its anticipated lifespan and requires frequent maintenance. Chapter 5, Airport Alternatives, will review locations to accommodate a reconstructed / relocated Police Air Support Unit. Police response times require their facility to be located on the south side of the airfield so that helicopters will not have to cross over the flight paths of arriving and departing aircraft.

3.7.2 Aircraft Rescue and Firefighting

DVT does not currently have any on-airport ARFF services. Nearby City of Phoenix Fire Station 36 provides fire and rescue support services during incidents. Should the Police Air Support Unit be relocated, it is recommended that Fire Station 36 be relocated and combined with the Air Support Unit in a consolidated Public Safety Building. A consolidated Public Safety Building could provide airside and landside fire response as well as Police Air Support Unit services in a single building. Police and Fire staff have stated that it would be advantageous to their operations to collocate in a single building. At Part 139 certificated airports, the capability of ARFF services is classified by the ARFF index. The ARFF index is determined based on the wingspan of the critical aircraft operating more than 5 daily departures at an airport. Since DVT is not a Part 139 certificated airport, it is not required to comply with ARFF index criteria. It is expected that if a landside fire station is located on airport property, traditional landside firefighting equipment will be sufficient to respond to any airside emergency.

3.7.3 Fuel Storage

Current fueling operations are described in Chapter 1, Inventory of Existing Conditions. Fuel storage requirements are determined for the month with the greatest fuel demand, April. Historical breakdowns between Jet-A and AVGAS were not available, and as a result, the total storage requirements for both fuels are combined in **Table 3-15**. It is typically recommended that an airport have sufficient storage capacity to hold up to a 7-day demand of fuel. DVT has sufficient fuel storage capacity through the planning horizon. The FAA is testing unleaded fuel options although approval and widespread use of an alternate fuel is not expected for another 10 years. Consideration should be given to additional storage that may be required in the future while unleaded AVGAS is phased into regular use among operators. During this time storage may be required for both leaded and unleaded fuel.

Table 3-15: Fuel Storage Requirements

Fuel Storage	2013	2018	2023	2028	2033
Fuel Utilization (gallons per ADPM departure)	12	12	12	12	12
Forecast ADPM Departures	621	642	727	856	1,008
Daily Fuel Demand (gallons)	7,452	7,704	8,724	10,272	12,096
Fuel 7-Day Storage Requirement (gallons)	52,164	53,928	61,068	71,904	84,672
Existing Storage Capacity (gallons)	117,000	117,000	117,000	117,000	117,000
Fuel Storage Surplus / Deficiency (gallons)	64,836	63,072	55,932	45,096	32,328

Source: HNTB Analysis

3.7.4 Utilities

The existing utilities serving DVT's existing facilities were deemed adequate through the planning horizon. The area south of the airfield is built out with existing utilities aside from the area reserved for corporate aviation on the southeast quadrant which has utility stub outs. The undeveloped parcels on the north will require additional utility placements for any proposed development. Water pressure considerations are discussed in Section 7.2.3.10 Water Quality.