

Airport Driver's Training Guide



Denton Enterprise Airport



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Introduction

The Denton Enterprise Airport (DTO) Driver's Training Guide presents guidelines and procedures designed to enhance the safety and efficiency of all aircraft movement area operations. This program allows DTO to maintain a high level of safety for all who operate in the aircraft operations area.

This study guide contains basic information, which should be thoroughly understood by all persons who intend to operate in the Non-Movement and/or Movement Areas.

About DTO

DTO is classified by the Federal Aviation Administration (FAA) as a general aviation (GA) reliever for the Dallas/Fort Worth International Airport (DFW). In 2014 had over 157,000 aircraft operations (takeoff or landing), making it the 6th busiest airport in Texas. DTO has:

- FAA Contract Air Traffic Control tower operated by RVA, Inc.
- Runway: 7,002' long x 150' wide
- Instrument Landing System (ILS)
- Automated Surface Observing System (ASOS)
- Two fixed-base operators (FBO)
- On-site Aircraft Rescue and Firefighting (ARFF) truck and equipment

Airport Operations Area (AOA)

The Airport Operations Area (AOA), also called the *Airside*, consists of all restricted ground areas of the airport, including taxiways, runways, service roads, loading ramps, and parking aprons. Vehicle access to the AOA is obtained through various automated and manual gates along the security fence. Extra attention should be given to assuring all gates close and secure behind you while entering and exiting the AOA. If a gate is found open it should be secured and your supervisor, as well as Airport Management, should be notified.

The AOA can be a confusing, congested place for a vehicle operator. Many different types of vehicles operate simultaneously to service aircraft, as well as to maintain the airfield and navigational aids. Vehicle operations could have an adverse impact on aviation safety if a driver does not follow established safety procedures and practices on the AOA. All ground-based vehicles on the AOA, regardless of its size or purpose, shall yield to all approaching aircraft.

AIRCRAFT ALWAYS HAVE THE RIGHT OF WAY!

It is important to remember that you, as a vehicle operator, have the same level of accountability and responsibility as that of a pilot taxiing an aircraft.

The AOA is divided into two distinct areas: the non-movement area and the movement area. The following image shows the marking between the non-movement and movement areas.



Figure 1: Movement Area line marking

As illustrated by Figure 1 above, the side facing the solid yellow line is the non-movement area, while the side facing the broken yellow line is the movement area. While pilots and drivers wishing to exit the movement area are free to cross the line at any time, those wishing to enter the movement area from the non-movement area must get the ATCT permission to cross.

Driving on the Non-Movement Areas

Non-movement areas include taxilanes, aprons, service roads, and other areas **not** under control of the Air Traffic Control Tower (ATCT); anyone authorized to operate a motorized vehicle in the AOA may do so on the non-movement areas without being in positive radio contact with the ATCT. Taxilanes are paved areas used for taxiing aircraft in the non-movement area. Aprons are areas used for parking aircraft. Service roads (indicated in Figure 2) are designated lanes intended for the movement of ground support vehicles (such as tugs, golf carts, and fuel trucks), and help establish the predictability of vehicle movements in congested areas and ensure their visibility to aircraft and other vehicles.

Operating within these areas require the vehicle driver to exercise extreme caution because aircraft are often moving, aircraft passengers and/or crew may be walking to and from an aircraft, and noise levels generated by aircraft engines can be very high. Furthermore, extra caution must be taken when driving around parked aircraft and when crossing or driving on a taxilane, especially when aircraft are taxiing.

Adverse weather conditions (fog, rain, etc.) may reduce visibilities and obscure visual cues, roadway markings, and airport signs. Watch out for aircraft operating in the vicinity under low-visibility conditions. There are additional risks present under these conditions.



Figure 2: Service Road

Drivers in the non-movement area should:

- Watch cockpit blind spots—pilots typically cannot see behind or below the aircraft, and their ability to maneuver quickly on the ground is limited.

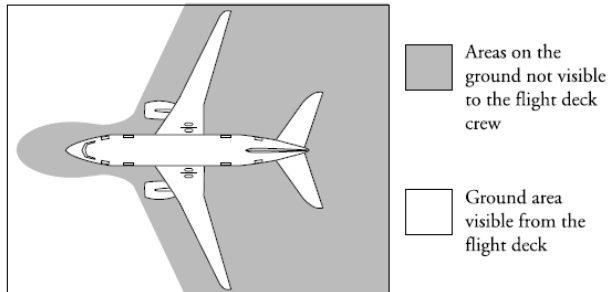


Figure 3: Aircraft Blind Spots

- Avoid jet blast or prop wash, which can blow debris or overturn vehicles. Parked aircraft may still have their engines running, so be aware of the hazards of jet blast or prop wash. Before an aircraft engine is started, the aircraft's red flashing beacons should be on.
- Be aware and avoid moving propellers that can cause damage, injury, or death. In some instances, propellers and engine spinners are marked to indicate when the engine is operating.
- Be aware of other vehicle movements—you may not hear them approaching due to aircraft engine noise.
- Yield to aircraft, pedestrians, and emergency vehicles, which ALWAYS have the right-of-way on any portion of the airport.
- Remain vigilant of their surroundings and operating boundaries.
- Use the service roads wherever possible.
- Conform to the speed limit if posted.
- Wear protective hearing equipment such as earplugs or earphones to prevent the reduction (or even loss) of hearing ability. It is very critical to note that aircraft taking off or taxiing are not necessarily the only time it is generating excessive noise; it may also generate excessive noise when simply parked on the apron if its auxiliary power unit (APU) is running.

Driving on the Movement Areas

The FAA defines the movement area as “*runways, taxiways, and other areas of an airport that are used for taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and aircraft parking areas.*” The movement area is the portion of the airport under the complete control of ATCT, including runways, taxiways, and other areas of the airport that are used for taxiing, hover taxiing, air taxiing, and takeoff and landing of aircraft. All authorized and trained personnel who must operate in the movement area **are required to be in constant radio communication at all times** as mandated by the FAA, which is to ensure the safety and security for all passengers and crews. More on radio communications will be discussed in greater detail later in this manual.

Driving on the movement area requires more training and vigilance as there are additional dangers associated with this area that are not present on non-movement areas. In addition to the principles for driving on the non-movement area, drivers who have access to the movement area must be cognizant of the meaning of airfield signs, markings, and lighting. To minimize the risk of collisions, only those vehicles necessary for airport operations may enter a movement area. Therefore, fuel trucks, tugs, personal vehicles, and other nonessential vehicles are not permitted to enter these areas without authorization and training.

Taxiways

Taxiways are pavement used by aircraft to get to and from the apron and the runway. Taxiways that are on non-movement areas are called *taxilanes*.

Taxiway Identification

Taxiways are identified by letters or letter/number combinations.

Taxiway Markings

Taxiway markings are yellow. They have a solid yellow centerline stripe and may also have solid or dashed double edge lines.

Taxiway Lights

Taxiway edge lights are blue. The stretches of Taxiway B that interface with the non-movement area do not have edge lights. Some taxiways at DTO have green reflectors along its centerlines.



Figure 4: Taxiway Edge Lights

Taxiway Hold Line and Enhanced Centerline

Each taxiway that intersects a runway will have the *hold position marking* also called “hold short lines” represented by a parallel set of double-dashed line and a double-solid line. When approaching the runway, you should stop behind the double solid lines to remain clear of the runway; only proceed across the hold short line when cleared by the ATCT to do so.

Taxiway center lines may be enhanced when approaching the hold line with dashed lines painted on both sides of the solid center line. These markings extend 150 feet from the hold line.



Figure 5: Hold Short marking and Enhanced Centerline marking

Runways

Runways are long, paved surfaces designed for the landing and takeoff of airplanes. Only drive on runways when necessary for airport operations. Do not enter or cross a runway unless you have authorization from airport management and permission from ATC.

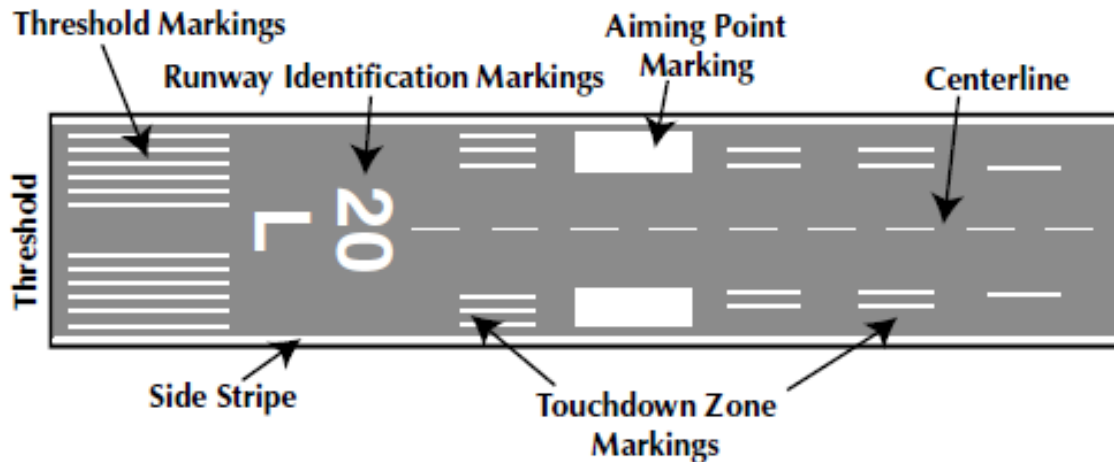


Figure 6: Markings on the Runway

Runway Identifications

Runways are numbered from 1 to 36 based on their magnetic direction rounded off to the nearest 10 degrees. For example, a runway aligned to the magnetic heading of 180 degrees would be Runway 18. Each runway will have two identifications based upon the direction of travel. At DTO, one end of the runway is numbered “18,” and the other end is numbered “36”.

Runway Markings

Runway markings are white. The runway has a centerline and a runway identification marking located at each end, as well as other markings such as side stripes, thresholds, aiming points, and touchdown zone markings.

Runway Lights

Edge lights on the runways are white but change to yellow for the last 2,000 feet. Threshold lights are located at the runway end; these are green on the approach side and red on the runway side.

Airfield Signs

There are four types of signs that you may encounter on the movement area—mandatory instruction signs, location signs, direction signs, and runway distance remaining (RDR) signs. These signs are color-coded for easy recognition and are located along the runways and taxiways.

Mandatory Instruction Signs

A **white inscription** on a **red background** is a mandatory instruction sign—**do not** proceed past one of these signs without explicit clearance from ATC. The most common form of this sign is the **runway hold position**. Both runway identifications are usually included on the sign with the numbers arranged to indicate the direction of each threshold. For example, 36-18 indicates that the threshold for runway 36 is to the left, and the threshold for runway 18 is to the right. These signs are also known as “aviation stop signs.”



Figure 7: Mandatory Instruction Sign

Location Signs

A **yellow inscription** on a **black background** is a location sign, which identifies the taxiway or runway that you are on. For example, in Figure 8, the sign tells you that you are on Taxiway A.



Figure 8: Location Sign

Direction Signs

A **black inscription** on a **yellow background** is a direction sign. These signs always have arrows that show the direction to turn onto the indicated taxiway. Direction signs may also indicate a direction to a destination on the airport such as a runway or terminal building. In Figure 9, the sign displays the directions of Taxiway B.



Figure 9: Direction Sign

Array Signs

Sometimes multiple signs will be co-located at an intersection of taxiways. These signs are referred as *arrays*. Arrays are a combination of location and direction signs. Figure 10 shows a couple of arrays found on the airport. The one on the left tells you that you are located on Taxiway A4 while indicating which way Taxiway A runs; the one on the right tells you that you are on Taxiway A while indicating the directions of B and A3.



Figure 10: Signs lined up in an array

Runway Distance Remaining (RDR) Signs

A **white inscription** on a **black background** is a runway distance remaining sign. These signs are found exclusively on runways, indicating the amount of runway pavement ahead. The number on the sign represents the distance left ahead in thousands of feet. For example, in Figure 11, the '6' means there is 6,000 feet of runway left ahead.



Figure 11: Runway Distance Remaining sign

Communications

Any vehicle driving on the movement areas (runways and taxiways) must be in contact with the ATCT or capable of monitoring and transmitting on the Common Traffic Advisory Frequency (CTAF). Vehicle operators must always monitor the appropriate radio frequency when in the movement areas. Permission must be requested and clearance given prior to driving on a movement area.

The ATCT controller may use separate or common radio frequency to control all ground traffic, vehicle and aircraft, on the movement areas. The frequency is only to be used to get clearance onto and off the movement areas. There are two frequencies used to communicate with the tower as shown in the table below.

123.95	Ground Frequency	To obtain clearance to enter the movement area and navigating the taxiway during ATCT operating hours.
119.95	Tower/CTAF Frequency	To obtain clearance for driving on the runway during ATCT operating hours, or anytime the ATCT is closed.

Vehicle operators must tell the controller three things: **WHO you are, WHERE you are, and WHAT your intentions are.** Vehicle operators must always acknowledge all communications so that ground control and other persons know that the message was received. **Vehicle operators must always give aircraft and ground control transmissions priority unless an emergency exists.** Very high frequencies are for the primary use of aircraft and ATCT personnel. For example, a complete statement you might transmit to the tower could go something like:

Driver: *“Denton Ground, this is Tug 2 located on Taxiway Golf. Tug 2 is requesting clearance to proceed northbound on Taxiway Bravo, and then northbound on Taxiway Alpha to get to Taxiway Alpha 1.”*

Although technically this statement does correctly conform to standard radio protocol, there is a better way to communicate by reducing your statement by eliminating excess wording, especially the words ‘runway’ and ‘taxiway’. A better way, indeed recommended way, of stating the previous statement would go something like this:

Driver: *“Denton Ground, Tug 2 is at Golf; request to proceed north on Bravo-Alpha to Alpha 1.”*

The latter statement, though shorter, is understood by the ATCT exactly the same as the former statement but is stated more concisely.

Reply transmissions could go something like:

ATCT: *“Tug 2, proceed as requested.”*

Driver: *“Roger (that), Tug 2 (proceeding as requested).”*

In that last statement by the driver, adding the parts enclosed in parenthesis is optional and can be omitted, and still within protocol. In some cases, it is not required to read back ATCT’s transmission. You are still (at a minimum) required to acknowledge their reply by saying ‘roger’ followed by your call sign. However, in situations where you are instructed by the ATCT to hold short of the runway or any taxiway, you **are required** to read back their instruction.

Driver: *“Denton Ground, Tug 2 is at (Taxiway) Hotel; request clearance to (runway) 1-8.”*

ATCT: *“Tug 2, proceed north on Bravo-Alpha and **hold short** (runway) 1-8.”*

Driver: *“Roger that, Tug 2 will hold short at 1-8.”*

When approaching the runway, you are to switch to the Tower frequency (119.95).

Driver: *“Denton Tower, Tug 2 is on Alpha 1; requests clearance to proceed southbound on 18 to tow a disabled aircraft.”*

ATCT: *“Tug 2, proceed southbound on 1-8.”*

Driver: *“Roger, Tug 2; proceed southbound on 1-8.”*

Upon exiting the runway, always alert the tower that you are clear of the runway.

Driver: *“Denton Tower, Tug 2 is clear of the runway.”*

NOTE: If you are unsure what the controller has said, or if you don’t understand an instruction, ask the controller to repeat it. Good communication only occurs when each party knows and understands what the other is saying.

As a courtesy to the tower, it is always good practice to announce when you have cleared the movement area:

Driver: *“Airport 2 is clear of the movement area.”*

Escort Procedures

All vehicles without a UNICOM radio that need to operate in the movement area, must be escorted by a vehicle equipped with one. In this case, to communicate with the ATCT, the driver in a radio equipped vehicle must indicate to the tower their intention of escorting another driver who has no means of talking to the ATCT. To do this, always identify exactly how many vehicles will follow you.

An example radio transmission of an escort driver goes something like this:

Driver: *“Denton Ground, this is Airport 1 plus one at Taxiway Golf.”*

In the above statement, the escorting driver identified one other vehicle that intends to follow the escort. If you intend to escort two other vehicles on the movement area, add the phrase “plus two” and so on. Airport management recommends escorting no more than two other vehicles per authorized driver.

CTAF Communication

Between the hours of 10 p.m. and 6 a.m., the ATCT is closed, and the airport is “uncontrolled.” The risk of a collision increases significantly; it is therefore even more critical to communicate effectively via radio. When needing to operate in the movement area during these hours, the CTAF frequency (also 119.95) should also be used. In this case, you are talking directly to the pilots themselves, who are flying in the vicinity and may want to land at your airport. Although you can drive onto the movement area at will (without ATCT clearance), you must always announce your identification, location, and intentions (just as you would to an ATCT controller) to alert other pilots of your presence on the airfield. If you intend to approach the runway or drive on it, you must also announce your intention to do so.

An example transmission over CTAF would go something like this:

Driver: *“Attention all Denton traffic, this is Airport 1 on Taxiway Hotel; Airport 1 is moving to Runway 18-36 via Taxiways Bravo and Alpha 5.”*

Driver: “Attention Denton traffic, Airport 1 is on Taxiway Alpha 5 holding short of Runway 18-36; Airport 1 is moving onto Runway 18-36 and exiting the Runway 18-36 at Taxiway Alpha 3.

Aviation Phraseology

When operating on the airport and communicating with ATCT, it is important to understand the phraseology that controllers, pilots, and personnel all use on the radios. The list below outlines the meaning of the different words and phrases that you will need to know, and it is followed by the phonetic alphabet, which is also used in aviation.

Acknowledge — Let me know you have received and understand this message.

Advise intentions — Tell me what you plan to do.

Affirmative — Yes.

Confirm — My version is... is that correct?

Correction — An error has been made in the transmission, and the correct version follows.

Go ahead — State your message (**never means “proceed”**).

Hold — Stop where you are.

Hold short of... — Proceed to, but stop at that point.

Negative — No, or permission is not granted, or that is not correct.

Proceed — You are authorized to begin or continue moving.

Read back — Repeat my message back to me.

Roger — I have received all of your last transmission. (It should not be used to answer a yes or no question.)

Say again — Repeat what you just said.

Standby — Wait... I will get back to you. (Standby is not an approval or denial. The caller should reestablish contact if the delay is lengthy.)

Unable — Indicates inability to comply with a specific instruction, request, or clearance.

Verify — Request confirmation of information.

Wilco — I have received your message, understand it, and will comply.

Using the Phonetic Alphabet

In aviation, the phonetic alphabet is important to memorize, understand, and use whenever speaking on the radio. It allows Air Traffic Controllers, pilots, and other personnel to understand each other more clearly without the need for repetition. The phonetic alphabet is a list of words corresponding to each letter of the alphabet, and whenever someone needs to say a letter over the radio, that person should use the word that matches with the letter instead.

Table 1: List of Phonetic Alphabet and Numbers

The Aviation Alphabet

The following is the International Civil Aviation Organization (ICAO) phonetic alphabet that is used in radio communications. Use the words in place of letters to reduce confusion. For example, Taxiway B would be referred to as Taxiway Bravo.



A	Alpha	AL-FAH	N	November	NO-VEM-BER
B	Bravo	BRAH-VOH	O	Oscar	OSS-KAH
C	Charlie	CHAR-LEE	P	Papa	PAH-PAH
D	Delta	DELL-TAH	Q	Quebec	KEH-BECK
E	Echo	ECK-OH	R	Romeo	ROW-ME-OH
F	Foxtrot	FOKS-TROT	S	Sierra	SEE-AIR-RAH
G	Golf	GOLF	T	Tango	TANG-GO
H	Hotel	HOH-TEL	U	Uniform	YOU-NEE-FORM
I	India	IN-DEE-AH	V	Victor	VIK-TEH
J	Juliett	JEW-LEE-ETT	W	Whiskey	WISS-KEY
K	Kilo	KEY-LOH	X	X-ray	ECKS-RAY
L	Lima	LEE-MAH	Y	Yankee	YANG-KEY
M	Mike	MIKE	Z	Zulu	ZOO-LOO

1	One	WUN	6	Six	SIX
2	Two	TOO	7	Seven	SEV-EN
3	Three	TREE	8	Eight	AIT
4	Four	FOW-ER	9	Nine	NIN-ER
5	Five	FIFE	0	Zero	ZEE-RO

ATCT Light Gun Signals

Air traffic controllers have a backup system for communicating with aircraft or ground vehicles if their radios stop working. The controller has a light gun in the tower that can send out colored lights to tell the pilot or driver what to do. If a vehicle operator experiences a radio failure on a runway or taxiway, the operator should vacate the runway as quickly and safely as possible and contact the ATCT by other means, such as a cellular telephone, to advise the ATCT of the situation. If this is not practical, then the driver, after vacating the runway, should turn the vehicle toward the tower and start flashing the vehicle headlights and wait for the controller to signal with the light gun. Light gun signals, and their meanings, are as follows:

Table 2: ATC Light Signals

Air Traffic Control Light Signals				
Color and type of signal		Aircraft on the ground	Aircraft in flight	Movement of vehicles, equipment and personnel
Steady green		Cleared for takeoff	Cleared to land	Cleared to cross, proceed, or go
Flashing green		Cleared to taxi	Return for landing (followed by steady green)	Not applicable
Steady red		Stop	Give way to other aircraft and continue circling	Stop
Flashing red		Taxi clear of the runway in use	Airport unsafe, do not land	Clear the taxiway/runway
Flashing white		Return to starting point on airport	Not applicable	Return to starting point on airport
Alternating red and green		Exercise extreme caution	Exercise extreme caution	Exercise extreme caution

Operating When the Control Tower is Closed

At DTO, the control tower does not operate on a 24-hour basis. The rules for driving on the AOA are basically the same as when the control tower is open. The major difference is in radio communication. When the control tower is closed, the CTAF is the same as the tower frequency. It is not necessary to get a controller's permission before driving on a runway or taxiway. If you need to drive on taxiways or runways, carry a radio tuned to the CTAF. Monitor radio transmissions on this frequency to maintain the location of aircraft relative to your location. Before entering and while driving on runways and taxiways, always announce your intentions on the CTAF. This allows both you and pilots operating on the airfield to maintain situational awareness. Remember, the pilot may not be making radio position reports. Therefore, **always** consider **all** runways to be active in both directions. When you get near runways and taxiways, **SLOW DOWN!** Look both ways, and then look up for aircraft landing or taking off. **Always yield the right-of-way to aircraft.**

Driving on Taxiways

Give taxiing aircraft plenty of room. If an aircraft is on the same taxiway, move out of the aircraft's way.

Crossing Runways

If an aircraft is about to land on a runway that you need to cross, stop and yield to the aircraft. Be aware that many pilots use the airport for training purposes and may be executing a "touch and go" landing, in which the pilot applies full power and takes off again immediately after landing. Do not enter the runway until the aircraft has landed and either exited the runway or passed the point on the runway where you wish to cross. Then proceed. The runway gradient makes it impossible to see the entire length of the runway, and an aircraft can suddenly appear as you are crossing. For this reason, it is best to cross at the end of the runway. For both pilots and vehicle operators, extra vigilance is the key when operating at airports while the control tower is closed. Your eyes and ears are two of the most important safety features that you have. Although the airport may not be busy at times, do not be lulled into complacency. Just because there is very little traffic, do not assume that this is always the case. Always use your vehicle's rotating beacon, if equipped, anytime you are moving about the airport surface.

Figure 12 shows the typical pattern of an aircraft on approach getting ready to land.

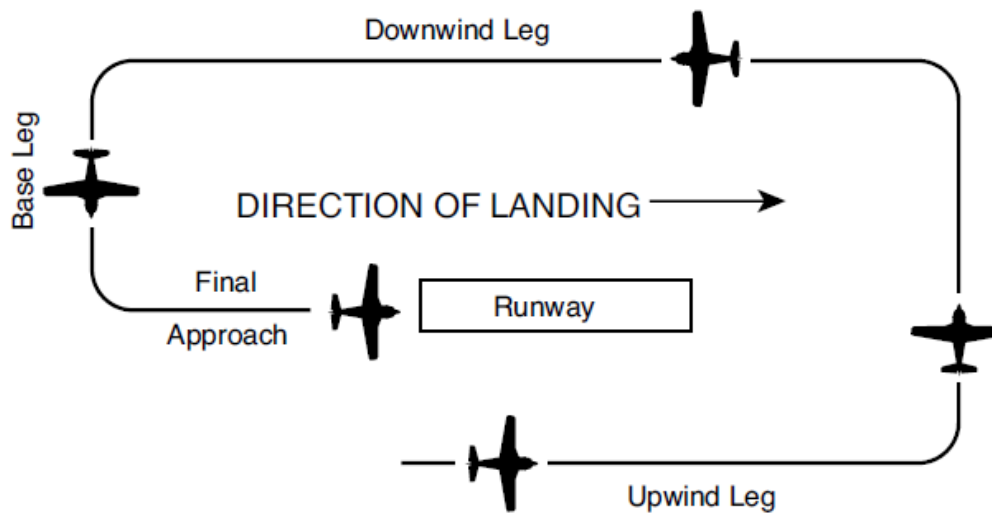


Figure 12

Runway Incursions and Surface Incidents

A Vehicle-Pedestrian Deviation (VPD) is any unauthorized action by a pedestrian or ground vehicle operator without proper clearance from the ATCT. There are two types of VPDs: Surface Incident and Runway Incursion.

A **Surface Incident** is an incident where an unauthorized person or vehicle movement occurs within the AOA, or an occurrence in the AOA associated with the operations of an aircraft that affects or could affect the safety of that flight. An example of a surface incident would be a ground vehicle crossing the boundary as shown in Figure 13 into the movement area without contacting the ATCT. Regardless of whether or not a collision with an aircraft is imminent or has occurred, crossing the movement area line without clearance from the ATCT is a **federal offense!**

All individuals who are unwilling or unable to communicate with the ATCT are to stay on the non-movement side.



Figure 13

The International Civil Aviation Organization (ICAO) defines **runway incursion** as: “Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and take-off of aircraft.

Runway incursions are a particularly dangerous and potentially deadly situation because of the risk of collision with aircraft taking-off, landing, or intending to takeoff or land, and at those speeds, the consequences of colliding with an aircraft are extremely severe and life-threatening. Primary causes of runway incursion are miscommunications between the ATCT and either the pilot or ground vehicle driver, unfamiliarity with the airport, lack of situational awareness, or any combination thereof. An example of an incursion is a vehicle at an airport with an operating ATCT straying onto a runway in front of an aircraft causing the pilot to take an evasive action to avoid a collision.

When driving on the airfield, vehicle operators need to always be aware of their location and the meaning of all pavement markings, lights, and signs. When on the AOA, stay away and steer clear of aircraft. **Aircraft always have the right-of-way!**

Any individual involved in a runway incursion or a surface incident will receive remedial ground vehicle training and may result in loss of movement area access privileges. In addition, all such offenders – regardless of position or experience – will be questioned by Airport Management and the FAA and possibly face legal action accordingly.

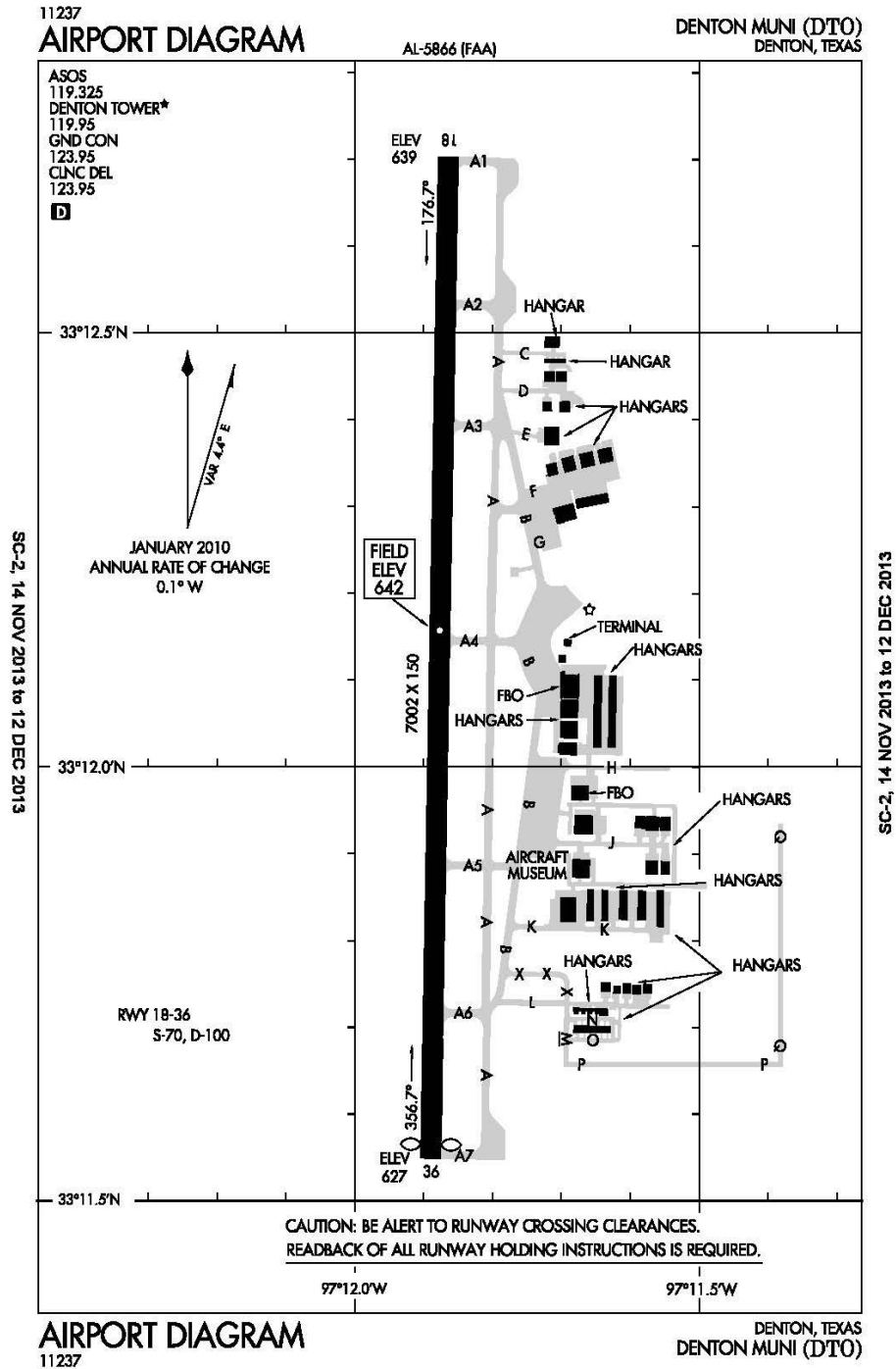


Figure 14: FAA Diagram of DTO

Airport Movement and Non-Movement Area Diagram



Figure 15