Federal Aviation Administration

FAA Guide to
Ground Vehicle Operations

A Comprehensive Guide
to Safe Driving on the
Airport Surface

Traffic levels rise, airports expand, surface routes change, and you, the vehicle driver, are expected to understand how to safely move about the airport. Besides learning about the different movement areas on the airport, the added combination of changes in weather, time of day and amount of aircraft traffic makes the risk of error higher than ever.

Runway incursions are a serious safety concern and significantly impact safe operations at any airport. Incursions, which also can occur on taxiways although not considered runway incursions, have involved air carrier aircraft, military planes, general aviation aircraft, air traffic controllers, ground vehicles and pedestrians.

A Runway Incursion (RI) is defined 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 takeoff of aircraft. There are three types of RIs: Operational Errors (OE), Pilot Deviations (PD) and Vehicle/Pedestrian Deviations (V/PD).

Operational Errors involve air traffic control (ATC) and Pilot Deviations typically involve an airman's mistake. A V/PD occurs when a vehicle or pedestrian has entered the runway safety area without authorization from air traffic control. Annually, V/PD's comprise approximately 20% of total runway incursions.

The information presented in this brochure is focused on helping to inform and educate vehicle drivers about the various signs, lights, markings, phraseology and other procedures utilized in an airport environment. Listed below are some basic things to remember and practice before operating a vehicle on the airport:

✈ Review and understand airfield signage and markings.

✈ Review the most up-to-date airport diagram prior to moving the vehicle. Have the airport diagram out and available for immediate reference while driving in the operational area.

✈ Review current airfield information for any taxiway closures, runway closures, construction activity or other surface risks.

✈ Ensure appropriate vehicle lights (high beams, flashers, beacons and strobes) are operational prior to driving on the airport surface. Flashers and beacons help ATC, aircrews and other operators see vehicles in the movement area, especially during periods of reduced visibility and at night.

✈ Use service roads whenever possible to minimize time spent on taxiways and runways.

✈ During radio transmissions, use proper aviation phraseology and speak in a clear, concise manner.

✈ Copy your clearance and review the assigned route. Read back all clearances.

✈ If you do not understand an instruction, clarify with ATC before proceeding.

✈ While driving, refrain from using cell phone, texting or engaging in unnecessary conversation.

✈ Get as familiar as possible with the airport's roads, taxiways and runways before driving solo on the airfield. If possible, have someone who is very familiar with the airport accompany you until you are proficient at operating on the movement area.

The **FAA Guide to Ground Vehicle Operations** was created for you, the driver of a tug, fuel truck, baggage cart or other airport vehicle. This guide is not intended to provide comprehensive coverage of everything there is to know about surface safety. Rather, it focuses on five areas that are most important, as well as containing additional information and a chance for you to test your overall comprehension with a quiz.

Airport Basics

Airfield Signs, Markings and Lighting

Towered Airports

Non-Towered Airports

Aviation Phraseology

Additional Information

Self-Assessment

Each section identifies safety measures and information that will help you maintain situational awareness while on the airfield. "Situational awareness" is defined as being aware of your location on the airfield and how that location relates to your destination, other vehicles and aircraft. It can be maintained consistently by:

↣ Understanding and following Air Traffic Control (ATC) instructions and clearances.

↣ Using an airport diagram.

↣ Knowing the meaning of the visual aids available on the airport, such as airfield markings, signs and lights.

Maintaining situational awareness will help you avoid errors that lead to runway incursions. Runway incursions are a serious safety concern and it doesn't take much to be involved in one. Incursions and collisions have included all types of commercial, military and private aircraft as well as *GROUND VEHICLES*. Some have resulted in fatalities. All employees who operate vehicles or motorized equipment on airports have key responsibilities in these safety efforts, as this guide outlines.

AIRPORT BASICS

This section outlines the basic features of any airport. There may be important unique aspects to the airport on which you drive, such as dedicated vehicle lanes, areas not visible to controllers or nonstandard airport traffic patterns. Be aware and know the rules of your airport.

Runway Safety Area

The Runway Safety Area (RSA) is an area surrounding the runway, and is measured from the runway ends and centerline. Much like the shoulder area on a highway, the runway safety area is intended for use by aircraft in emergency situations, i.e., landing short of, veering off of, or overshooting the runway, and always should be free of vehicles, equipment and pedestrians any time aircraft are taxiing, taking off or landing. When the tower is in operation, vehicles and pedestrians are required to have clearance to access these areas. During periods when the tower is not operating or at a non-towered airport, extreme caution should be used.

The RSA can be identified by a hold line, also known as a holding position marking, which is painted in yellow on taxiway surfaces and collocated with a holding position sign. The holding position sign has a red background with white characters. The actual dimensions of the RSA will vary depending on the tail height and wing span of the largest aircraft authorized to utilize the airport. Its distance from the runway centerline may extend up to 280 feet across and as much as 1,000 feet beyond the runway ends.

Aprons/Ramps

Aprons, also called ramps, are the areas where aircraft park, load and unload. Your work may require you to drive on an apron. In addition to watching for moving aircraft on the apron, be careful to maintain a safe distance when working around parked aircraft. Aside from nicks and dents that are expensive to repair and can affect the airworthiness of the aircraft, you could get hurt and your vehicle damaged when an aircraft starts its engine. This hazard is called jet blast or prop wash. There have been several cases where vehicles have been overturned by jet blast. Drivers should be aware of the rotating red beacon(s) located on the aircraft's tail, and sometimes on its underside. The beacon is typically illuminated in conjunction with imminent engine start.

Runway Markings are WHITE

Runways have white numbers on each end, centerline stripes down the middle and may have white lines along the edges. Runways that are served by an instrument approach will have more elaborate markings such as those shown in Figure 1.1.
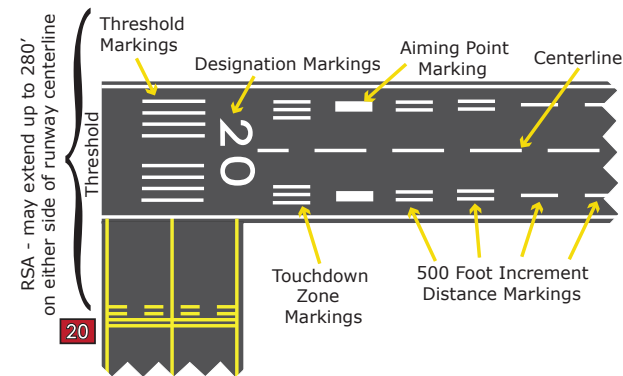

Figure 1.1 – Runway Markings (not to scale).

Taxiway Markings are Yellow

Taxiways are areas used by aircraft to get to and from the apron/ramp and the runway. Taxiways look similar to runways, but are usually not as wide. Instead of numbers, taxiways use letters or letter/number combinations for designators. See Figure 1.1

BEST PRACTICES FOR SAFE DRIVING

On the Movement Areas

✈ Together, runways and taxiways are known as the MOVEMENT AREAS of the airfield.

✈ Airport diagrams provide the layout and designations of runways and taxiways, show the location of major facilities and are essential to navigating the airfield surface. Always have a current airport diagram in your vehicle.

✈ If you are required to drive on or work in areas adjacent to runways, be aware that aircraft wings and engines may extend over these areas. ATC approval is typically required to operate in these areas.

✈ If you become uncertain of your location on the airport movement area, **STOP** and immediately contact ATC for help.

EXPLICIT RUNWAY CROSSING CLEARANCES: Never cross a holding position marking including hold lines for inactive or closed runways without explicit ATC instructions. Instructions to cross a runway will be issued one at a time. An aircraft or vehicle must have crossed the previous runway before another runway crossing is issued.

✈ Know your airfield markings, signs and lighting (as outlined in the next section). Be careful not to hit taxiway edge lights.

Around Aircraft

✈ Aircraft cockpit windows have a limited viewing area. It can be difficult or impossible for pilots to see vehicles and pedestrians, particularly behind the wings or under the nose of the aircraft.

✈ Always yield the right-of-way to moving aircraft. Do not assume the pilot will see you, especially in busy areas like aprons/ramps where pilots are busy with preflight checks.

✈ If a pilot is about to start the engine or the engine is running, the aircraft's red rotating beacon(s) should be turned on as well.
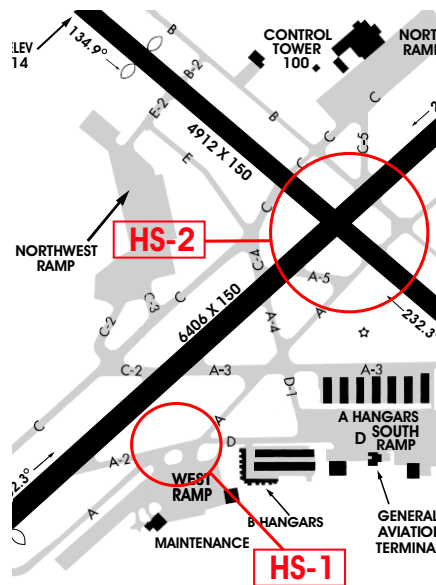
While Communicating with Air Traffic Control (ATC)

✈ Avoid distractions and focus on where other vehicles and/or aircraft are on the airfield, especially on your intended route.

✈ Always use standard aviation phraseology and proper communications procedures when contacting ATC in order to facilitate clear and concise communications.

✈ Write down taxi instructions, especially instructions that are complex. This can help reduce your vulnerability of forgetting part of the instruction.

✈ When in doubt, **STOP** and ask for help or clarification from ATC.

During Construction

→ Extra vigilance is necessary when driving on an airport during construction. Normal driving routes may be altered, runways and taxiways may be closed, runway thresholds may be displaced or relocated and hot spots may be identified. Therefore, remember to review your expected driving route against areas of construction, especially if you are operating a rescue vehicle.

Hot Spots

→ ICAO defines a hot spot as a location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary.

→ A hot spot is a runway safety related problem typically at a complex or confusing taxiway/taxiway or taxiway/runway intersection. As a vehicle driver, it is your responsibility to be familiar with these areas and use extreme caution when driving in, or near them. The airport diagram will usually, but not always point out designated hot spots. Be certain to use the most up-to-date diagram as hot spots will remain charted until such time the increased risk has been reduced or eliminated.

For more information on hot spots, refer to the Airport Diagrams chapter in the Airport Facility Directory (AFD). Also visit: www.faa.gov/airports/runway_safety/hotspots/hotspots_list

SIGNS AND MARKINGS

As a driver, it is important that you know the meanings of the signs and markings used on airports as navigational aids. Sometimes the information on the sign is also painted on the airport pavement. An overview of some of the most common signs and markings is described on the following pages. For more detailed information, see the FAA Aeronautical Information Manual (AIM).

Runway Holding Position Marking

Painted yellow on the taxiway pavement and collocated with the holding position sign, this is an airport version of a stop sign. As you approach the runway, you will see two solid yellow lines with two dash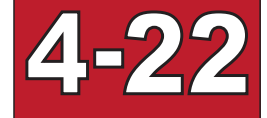ed lines. Prior to reaching the solid lines, it is imperative that you **STOP** and do not cross the lines until you have clearance from ATC. When the tower is closed or you are operating at a non-towered airport, you may cross only when the runway is clear of aircraft, and then cross with extreme caution. Always look both ways before you cross any runway!

When exiting a runway, you will see these same markings, except your vehicle will be approaching the dashed lines. Your vehicle must completely cross both the dashed and the solid lines to be clear of the runway.

Runway Holding Position Sign

May be seen as a sign and/or painted on the pavement, it has white characters on a red background. This sign/marking is collocated with the surface painted holding position markings on taxiway and runway intersections.

4-22

Do not drive past this sign or marking without a clearance from ATC. Doing so without clearance from the tower poses a hazard to yourself and others. When the tower is closed or you are operating at a non-towered airport, you may cross only when the runway is clear of aircraft, and then you should proceed with extreme caution.

Location Signs and Markings Black background with yellow letters and/ or numbers. These signs and surface-painted markings indicate your location. *REMEMBER: BLACK SQUARE, YOU'RE THERE. (See Figure 2.1)*

9 Runway **A** Taxiway

Taxiway Direction Signs and Markings These signs and markings with a yellow background and black characters indicate the direction toward a different taxiway leading off a runway or out of an intersection. *YELLOW ARRAY, LEADS THE WAY. (See Figures 2.1 and 2.2)*

J→

ILS Critical Area Holding Position Signs and Markings
May be seen as a sign (as shown here), and/or as a painted surface marking. These are utilized to show the boundary of the runway's ILS critical area. Hold short of this area when instructed to by ATC.
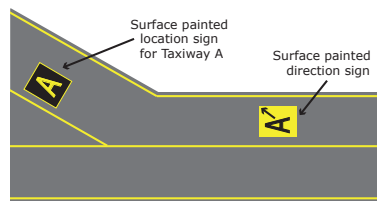
ILS

Surface painted location sign for Taxiway A
Surface painted direction sign

A
A

Figure 2.1 – Surface painted location and direction markings.

Alternative array of signs when location sign not installed.
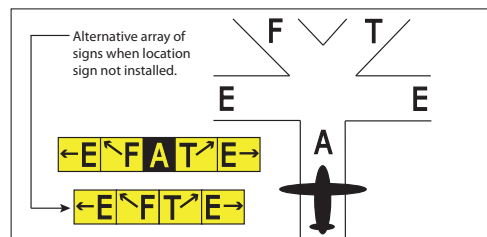
F T
E   E
←E↖FAT↗E→
←E↖FT↗E→
A

Figure 2.2 – Examples of taxiway sign arrays with and without current location on Taxiway Alpha.

Holding position markings for ILS critical areas appear on the pavement as a yellow horizontal ladder and extend across the width of the taxiway. An ILS holding position sign with white characters on a red background is typically situated adjacent to these ILS holding position markings. Hold short of this area when instructed to by ATC.

ILS Boundary Sign This sign identifies the boundary of the ILS critical area for pilots and vehicle operators exiting the runway. Pilots and vehicle operators must proceed beyond this sign to clear the ILS critical area when instructed to do so by ATC.
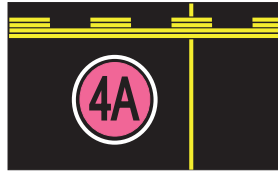
Non-Movement Area Boundary Markings
A single solid line along with single dashed yellow lines, this marking divides the movement and non-movement areas on the airfield. When you are positioned on the solid line side of the marking, or the non-movement area, ATC clearance is required for you to drive across into the movement area.

Runway Safety Area Boundary Sign Yellow sign with black markings. Visible only when exiting the runway. The sign is typically used on towered airports where a controller commonly requests a pilot to report clear of a runway, which occurs when this sign is passed.

Geographic Position Markings Pink with black and white. Some large airports use these markings in low visibility conditions as position points on the taxiway.

Helicopter Landing Area Marking Some airports have a designated helicopter landing pad. This area is depicted with an "H" inside of a square. Be especially careful when you drive near helipads. Look up for landing helicopters. As is the case for aircraft, yield the right-of-way to a helicopter.
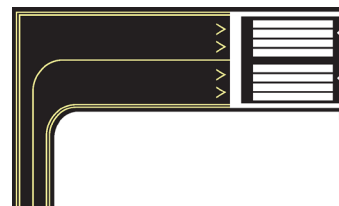

Destination Signs Yellow background with black letters. The taxiways at your airport may have these signs next to them to identify the direction to a specific destination, e.g. parking area.

Enhanced Taxiway Centerlines A dashed line painted on each side of the existing taxiway centerline extending up to 150' from the holding position marking. This is to further alert aircraft and vehicles that they are approaching a runway safety area.

Relocated Threshold A point on the runway other than the beginning of the full strength pavement, which is not available for the landing or takeoff of aircraft. Thus, a relocated threshold marks the end of the runway. The abandoned runway area may or may not be available for taxiing. Possible causes for threshold relocation include construction or other airport maintenance.
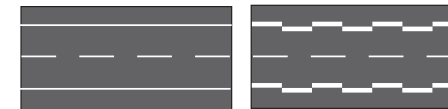

Chevrons Large yellow painted arrows that identify paved blast pads, stop areas, and EMAS (engineered materials arresting systems). A minimum of two chevrons will be painted and aligned with the runway end. The pavement marked by chevrons is not to be used, unless in conjunction with an EMAS when it may be used to help stop an aircraft overrun.

Aprons/Ramps
Aprons/Ramps have markings for aircraft parking and tie-downs. Some airport aprons/ramps also have special markings for vehicle operations. If there are vehicle or roadway markings, you should always drive your vehicle within those marked areas. In addition, taxiways may be marked on the apron to show aircraft routes to gates and parking areas.
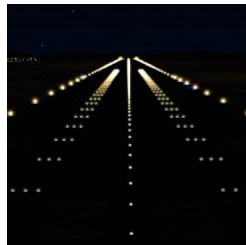

Examples of vehicle surface markings; roadways bounded by "zipper" markings are also used by aircraft.

When driving near navigational aids, stay out of the protected areas around them to avoid interfering with their signals. If a road or taxiway is close enough to an ILS to affect it, there should be an ILS holding position sign like the one depicted on page 12.
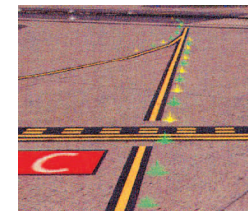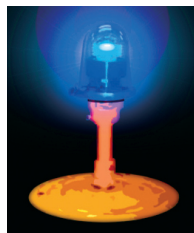
LIGHTING

There are many different lighting combinations that may be located on some airports, especially where aircraft operations are conducted in lower visibility ranges.

Runway Edge and Centerline Lights Runway edge lights are clear/white, except on instrument runways where yellow replaces white on the last 2,000 feet or half the runway length, whichever is less, to form a caution zone for landings. Centerline lights alternate red/white starting 3,000 feet from the end, and are solid red starting 1,000 feet from the end.

Taxiway Edge Lights or Reflectors are blue in color and used to outline the edges of taxiways during periods of darkness or restricted visibility conditions.

Taxiway Centerline Lights or Reflectors are green except for the lead-on and lead-off lights, which alternate yellow and green to indicate that you are entering or leaving the runway environment.

Runway Guard Lights are flashing yellow lights that can be in-pavement or elevated and are used to help identify a runway holding position.
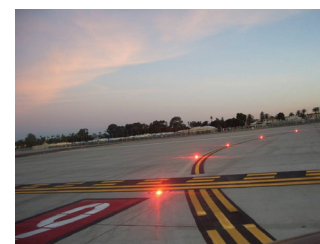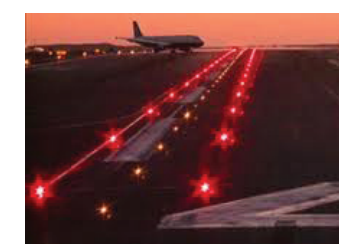
In-Pavement Runway Guard Light

Elevated Runway Guard Light

Runway Status Lights (RWSL) provide a visual warning to vehicle drivers and pilots that the runway is not safe to enter. RWSL consist of the following warning signals: runway entrance lights (REL) and runway intersection lights (RIL) for vehicles and aircraft crossing or entering a runway from intersecting taxiways or runways, and takeoff hold lights (THL) for aircraft awaiting takeoff. The system will be operational at 23 of the nation's major airports by the end of 2015.

Runway Entrance Lights

Takeoff Hold Lights

VEHICLE LIGHT GUN SIGNALS

Air traffic controllers have a backup system for communicating if radios fail. Controllers use a light gun that flashes different colors to tell pilots or vehicle drivers what to do. Even a failed radio is not an excuse for proceeding without a proper clearance. If you are ever working on a runway or taxiway and radio communication fails, you should:

✈ Turn your vehicle toward the tower.

✈ Flash your headlights.

✈ Wait for the controller to signal you with the light gun.

✈ Be patient! If the controller's attention is directed toward another part of the airport, it may take a few minutes.

✈ If still waiting, try a different radio frequency or call from a cell phone. Store the tower phone number in your cell phone for emergencies.

Light Gun Signals	
Steady Green Cleared to go; OK to cross runway or taxiway. **Flashing Green** Cleared to taxi. **DOES NOT APPLY TO VEHICLES!** **Alternating Red/Green** Exercise extreme caution. This warning signal can be followed by another light signal as circumstances permit.	**Steady Red** STOP! **Flashing Red** Clear the taxiway or runway IMMEDIATELY! **Flashing White** Return to starting point on airport.

TOWERED AIRPORTS

If your airport has an air traffic control (ATC) tower, it is a towered airport whenever the tower is operating. Pilots and vehicle drivers wanting to enter a runway or taxiway (movement areas) must first get permission from the tower.

As an operator of a vehicle, you must have authorization from ATC before you enter any part of the airport movement area. When the tower is in operation, you must utilize a two-way radio for communicating with and receiving instructions from air traffic control.

Radio Communications Procedures

✈ Ensure the availability of a radio capable of transmitting and receiving on the airport's ground control frequency. Perform a "radio check" to assess your radio's operability at the start of each shift.

✈ Each vehicle should be designated with an identifying call sign, and be marked and lighted appropriately.

✈ Know the standard Air Traffic Control (ATC) phraseology and never use Citizen's Band (CB) lingo or law enforcement 'ten' codes.

✈ Think about what you are going to say before calling the controller. Know your call sign, location on the airfield and where you intend to go.

✈ At most facilities, the above information can be included on the initial call as in the following example:

Driver: **Cincinnati ground, vehicle one at gate four would like to cross runway one eight right at taxiway alpha and proceed to the VOR.**

Controllers: **Vehicle one, Cincinnati ground, proceed via alpha, hold short of runway one eight right.**

Driver: **Roger, vehicle one, proceeding via alpha, will hold short of runway one eight right.**

✈ At larger facilities or when the controller is busy, it is best to simply call the tower with your identification and wait for the controller's response as in the following:

Driver: **Cincinnati ground, vehicle one.**

...time elapses...

Controllers: **Vehicle one, Cincinnati ground.**

Driver: **Vehicle one at gate four would like to cross runway one eight right at taxiway alpha and proceed to the VOR.**

✈ Read back of all runway holding instructions is required and must include the phrase "Hold Short", the runway's identifying number and your call sign.

The "Aviation Terminology" section on page 25 lists air traffic control terms and phrases with definitions. You should know what they mean before driving on an airfield.

With a little practice, radio communications are not difficult. If you are ever unsure about what the controller said, or if you don't understand an instruction, *ask the controller to repeat the communication by transmitting "SAY AGAIN" .*

A controller, even one who is extremely busy, would rather repeat and explain instructions than have a misunderstanding lead to a runway incursion. Don't proceed thinking that the instructions will become clear once you drive a little farther.

Advance Coordination

When you contact the tower before an operation, you will receive instructions on how to proceed. Be sure you understand your route, stopping points and holding positions. If you are not sure where you are going and would like turn-by-turn directions, ask the controller for "progressive" taxi instructions.

Use extreme caution when you hear the phraseology "go ahead". It is only meant for you to proceed with your message and is not to be used for any other purpose. It **NEVER** means to proceed in moving about, or to drive on the airfield.

NON-TOWERED AIRPORTS

When the control tower is closed or if there is no tower, the airport is referred to as non-towered. At a non-towered airport, you do not need controller permission before entering a runway or taxiway. Below are some best practices for operating on a non-towered airport:

✈ When you approach the runways and taxiways, STOP, LOOK both ways, and LISTEN for aircraft that are landing or taking off. Vehicle windows should be open to do this properly.

✈ Alert others when you are using a taxiway or runway by always making an announcement on the radio before you enter. Be specific with your location and intentions.

✈ Always yield the right-of-way to taxiing aircraft and give them plenty of room. If an aircraft is headed toward you on the same taxiway, move out of the aircraft's way.

✈ Always carry a radio tuned to the airport's Common Traffic Advisory Frequency (CTAF) or UNICOM.

✈ If an aircraft is about to land on a runway that you need to cross, stop well clear of the runway. Continue to yield to the aircraft until it has landed and taxied off of the runway.

✈ Be aware that some aircraft at non-towered airports are not equipped with radios.

✈ Before you cross a runway, ensure that no potentially conflicting aircraft are taxiing, landing or taking off. Be aware of aircraft at non-towered airports that frequently make touch-and-go landings (immediately after landing, full power is applied and the aircraft takes off again).

✈ If your vehicle has a rotating beacon, be sure to turn it on anytime you are on the airport surface. Turn on headlights as well, being careful not to blind any pilots in the area.

> **Example of a self-announcement by driver on UNICOM or CTAF:**
>
> **Driver: Millville traffic. Ops one vehicle entering runway 28 at approach end and proceeding full length to the end of the runway.**

Traffic Patterns

Aircraft approaching a runway for landing usually follow a standard landing pattern. Most runways are positioned so planes will take off and land into the wind. In most cases, the pattern is a rectangular box with the pilot making all turns to the left, as shown in Figure 3.1. In a few cases, airports will use right traffic patterns. However, don't assume all aircraft will always be flying in the standard pattern - it is not required, only recommended - so keep a visual look out to the sky just

> **Pilot: Millville traffic. Cherokee two zero niner zero whiskey, entering left downwind runway one zero, Millville.**

in case a pilot decides to fly a 'straight in' approach and doesn't enter the standard traffic pattern. Similarly, if a pilot announces "short final", expect that aircraft's landing to be imminent.

Pilots announce their position on the Common Traffic Advisory Frequency (CTAF)/Unicom using the names of the segments of the traffic pattern: Upwind, Crosswind, Downwind, Base and Final. See Figure 3.1

Extra vigilance is essential at non-towered airports, or when the control tower is not operating. While there may be CTAF or UNICOM frequencies available, pilots are not required to communicate or announce their position in the traffic pattern or on the surface. As a result, a driver can be lulled into complacency because the airport is not very busy. Nevertheless, always remain alert for the unexpected, even when aircraft traffic levels are light.

Another factor involves the runway angle or slope, which makes it difficult or impossible to see the entire length of the runway. As a result, an aircraft can suddenly appear on a runway when you are crossing. Generally, it is good practice to cross runways at their ends. If one is available, a perimeter road or taxiway is the recommended route for crossing a runway at a non-towered airfield.
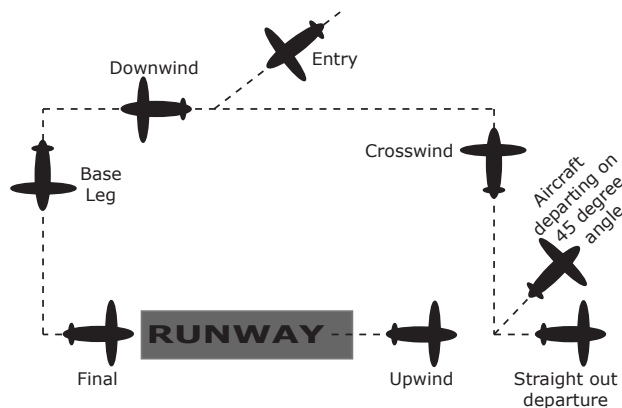

Figure 3.1 – Diagram of airport traffic pattern operations.

AVIATION TERMINOLOGY

This section contains a glossary of terms commonly used in ground or surface operations. For a complete listing of all ATC phraseology, consult the FAA Aeronautical Information Manual (AIM), which can be accessed at: http://www.faa.gov/air_traffic/publications/atpubs/aim/

Acknowledge - Let me know that you have received and understood this message.

Advise Intentions - Tell me what you plan to do.

Affirmative - Yes.

Confirm - My understanding of your transmission is _____ : Is that correct?

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

Final - Commonly used to mean that an aircraft is on the final approach course or is aligned with a landing area.

Go Ahead - Proceed with your message. Not to be used for any other purpose.

Hold or Hold Position - Stay in place where you are currently located.

Hold Short of… - Proceed to, but hold short of a specific point and maintain appropriate distance to avoid interfering with other traffic. With respect to runways, always stop at the runway

holding position marking unless otherwise directed by ATC. A read back confirmation to ATC is required anytime a "hold short" instruction is given.

Line Up and Wait (LUAW) - This phrase has replaced the "Position and Hold" instruction by a controller to direct a pilot to enter the runway and await takeoff clearance.

Negative - No; Permission not granted; 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 your last transmission; but not to be used to answer a question requiring a "yes" or "no" response (see Affirmative, Negative).

Say Again - Repeat what you just said.

Stand By - Wait for further information, as in "stand by for clearance".

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

Verify - Request confirmation of information.

Without Delay - Follow instructions expeditiously, specifically and safely.

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

AVIATION PHONETICS

Because some letters and numbers may sound similar, the following list will reduce confusion. For example, Taxiway B would be referred to as Taxiway Bravo, and Runway 29 is Runway Two Niner. As a vehicle driver, commit this phonetic alphabet to memory.

A Alpha	M Mike	Y Yankee
B Bravo	N November	Z Zulu
C Charlie	O Oscar	0 Zero
D Delta	P Papa	1 One
E Echo	Q Quebec	2 Two
F Foxtrot	R Romeo	3 Three
G Golf	S Sierra	4 Four
H Hotel	T Tango	5 Five
I India	U Uniform	6 Six
J Juliet	V Victor	7 Seven
K Kilo	W Whiskey	8 Eight
L Lima	X X-ray	9 Niner

ADDITIONAL INFORMATION

In addition to all the information provided to you in this publication, there are other things to be aware of while operating a vehicle on the airport.

Foreign Object Debris (FOD)

Trash or rocks sucked into a jet engine can shred parts of the engine in seconds. A rock caught by a propeller can damage the propeller, as well as become a deadly projectile. Make your airport a safer place by putting all trash in a covered container that won't be blown over. Get in the habit of picking up any trash and debris that you notice while driving around the airport. Avoid tracking mud and rocks onto taxiway and runway surfaces.

Reporting Accidents

If you are involved in an accident, report it immediately. If a collision occurred between you and an aircraft, it's critical that the aircraft not be flown until the damage can be inspected and repaired.

Aircraft Rescue and Fire Fighting (ARFF)

Just as when you are in highway traffic, if you see an airport emergency vehicle with its lights on, do not proceed until it has cleared. Always stay alert for any type of emergency activity and accompanying vehicles.

All vehicles operating at a towered airport, including ARFF and police, are required to receive explicit runway crossing instructions from ATC. This applies to all runways encountered: active, inactive and closed, regardless of the type of emergency!

Security

Depending on the type of airport you work on, the security system may be as simple as a fence or it may include items as complicated as computer controlled automatic gates with television screen monitors. At large air carrier airports, security will be provided by the airport's police department or local law enforcement. At smaller airports, the airport manager or the fixed-base operator may be responsible for security.

If you see a gate left open, close it, and then report it to the airport security office. Never let someone follow you through a gate. If you see a strange person or vehicle that appears lost, stop and offer assistance. Or, if your airport has a security department, contact them for help. If you work at an air carrier airport, the airport manager has a complete security plan of the airport with detailed procedures for specific situations. Be sure you know what your responsibilities are and ask your supervisor if there is anything about which you are unsure.

Nighttime or Bad Weather Driving

If you are required to drive on the airport at night, on your first couple of trips take someone along who is very familiar with the airfield. Things look different at night. The same applies if you are driving in bad weather. In both cases, allow yourself extra travel time and drive slower than you would normally. Remember, your vehicle's rotating beacon and headlights will provide additional visibility and help to identify your vehicle to others.

During winter conditions, signs and markings may be obscured by snow. Snow equipment may be operating in low visibility conditions and may not see your vehicle. Use caution; remember there are extra risks present.

This guide has covered the basics of how to safely drive on an airport. Remember to be courteous to your fellow drivers, pay attention, drive carefully, follow instructions, avoid distractions, obey the rules and regulations and set a good example. Eventually, with experience, you will attain a comfortable working knowledge of how to safely move around.

If there is something you don't understand, seek clarification before proceeding, especially when you are at a towered airport with an operating ATC tower. With experience, you will attain a comfortable working knowledge of moving about the airport surface safely. Always maintain situational awareness and contact ATC if you are unsure, lost or unclear of an instruction.

For more information:

Office of Runway Safety
www.faa.gov/go/runwaysafety

Aeronautical Information Manual (AIM)
http://www.faa.gov/air_traffic/publications/atpubs/aim/

Aeronautical Navigation Services Group (AeroNav) Airport Diagrams
www.faa.gov/airports/runway_safety/diagrams

Airport Security - TSA Part 1542
www.tsa.gov/research/laws/regs/editorial_1785.shtm

Runway Safety - Vehicle Drivers
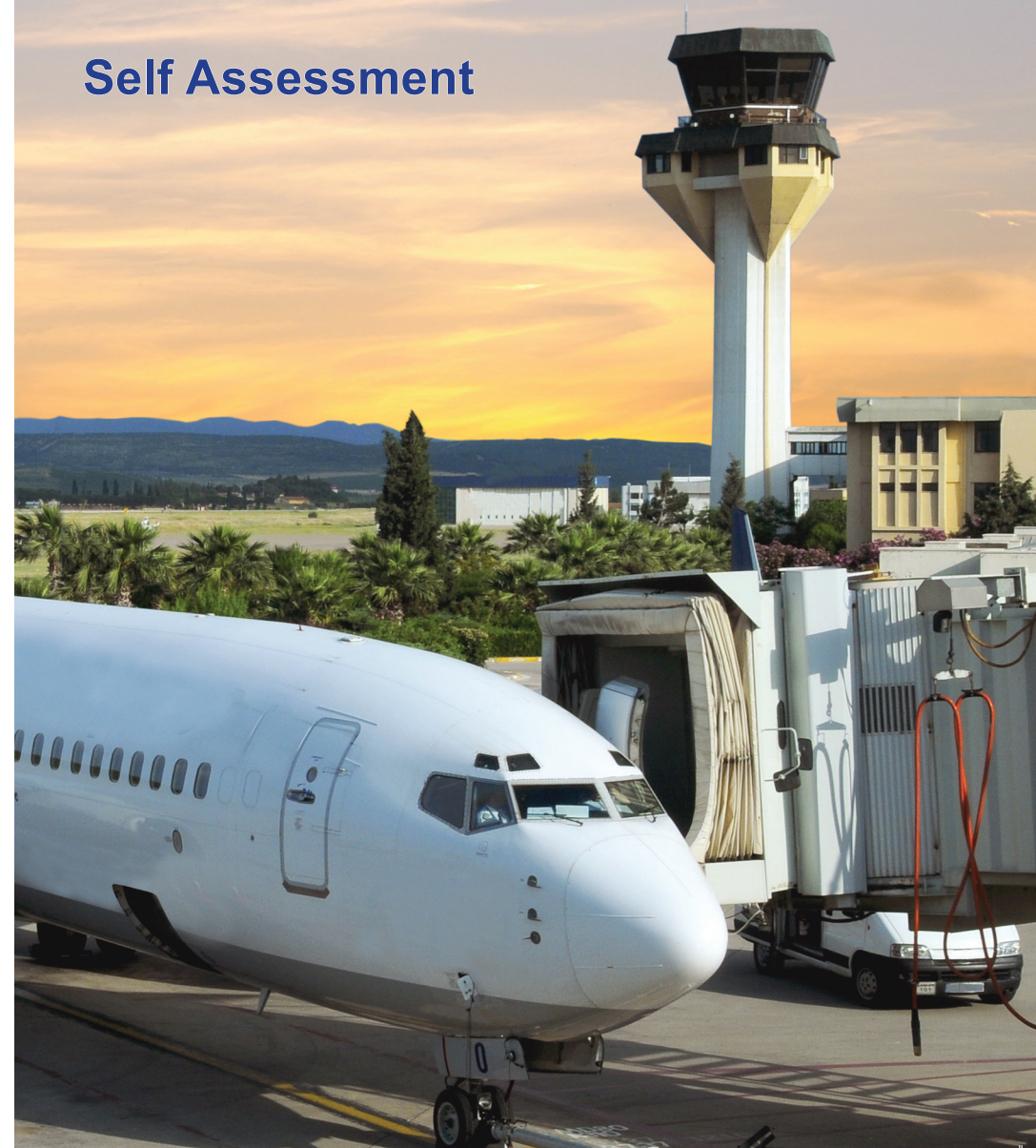www.faa.gov/airports/runway_safety/vehicle

Runway Safety - Hot Spots List
www.faa.gov/airports/runway_safety/hotspots/hotspots_list

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Federal Aviation Administration

FAA Guide to Ground Vehicle Operations
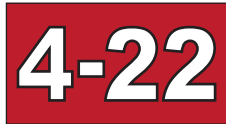
Self Assessment

1. **A controller who says, "Go ahead" means:**

   A. Proceed as requested.

   B. Continue straight ahead.

   C. State your message.

2. **The red and white sign next to the taxiway is called a runway holding position sign. This sign indicates:**

   4-22

   A. Runway 4/22 is ahead. This sign is collocated with surface painted holding position markings and indicates that you must have clearance from ATC to proceed.

   B. That you should follow the sign to get to the parking apron.

   C. Nothing to me, it's only there for the pilot's use.

3. **Two solid yellow lines with two dashed yellow lines represent the marking for a runway holding position. All aircraft, vehicles and pedestrians approaching the runway are required to have a clearance from ATC before proceeding beyond the two solid yellow lines.**

   A. True

   B. False

4. **Runway markings are:**

   A. White

   B. Yellow

   C. Red

5. **Taxiway markings are:**

   A. White

   B. Yellow

   C. Red

6. **As you are on your way to a construction site on the airfield, you are approaching a runway and have not received a specific instruction to cross the runway. What will you do?**

   A. Drive to the edge of the runway to see if it is clear of landing or departing aircraft, and then proceed.

   B. Stop prior to crossing the holding position marking and contact ATC for clearance.

   C. Use your cell phone to call someone at the construction site and ask if it is ok to cross the runway.

   D. Nothing, since vehicle drivers are not required to obtain clearance to cross runways.

7. **You are driving in a vehicle designated OPS-1 awaiting clearance to cross runway 19, and you hear ATC clear OPS-4 across runway 19. What will you do?**

   A. Proceed across runway 19 since you know that ATC meant to say "OPS-1".

   B. Contact OPS-4 on the radio to advise they are cleared to cross runway 19.

   C. Call ATC to clarify if the clearance to cross runway 19 was for OPS-1.

   D. Turn around and return to Operations because your shift is ending.

8. **A Runway Incursion is defined 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 takeoff of aircraft.**

   A. True

   B. False

9. **What does "Explicit Runway Crossing Clearance" mean?**

   A. A "taxi to" clearance will allow you to cross multiple runways.

   B. Typically, instructions to cross a runway will be issued individually for each runway encountered.

   C. It replaces "Position and Hold".

   D. It's a trick question, no such instruction exists.

10. **On a runway you see this sign. What does it mean?**

    A. You are approaching runway 22.

    B. You are on runway 22.

    C. It is an informational sign only.

    D. There are 2,200 feet remaining to the end of the runway.

11. **At night what color lights/reflectors mark taxiways?**

    A. White

    B. Blue

    C. Red

    D. Yellow

12. **When driving in the area immediately behind a large jet aircraft with its engines running, a driver should:**

    A. Not be concerned about danger from the jet blast because a typical car/van is too heavy to be affected.

    B. Stop or stay well back, and do not proceed too closely behind the aircraft.

    C. Cross the area of jet blast at a perpendicular angle to minimize the hazard.

    D. None of the above.

13. **Unless contrary instructions have been received from air traffic control, a vehicle should always yield to an aircraft.**

    A. True

    B. False
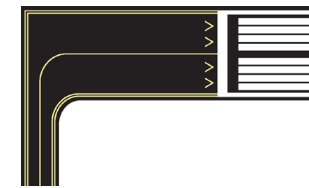
14. **This sign on a taxiway indicates:**

FBO ↘ 22•33➔

A. You must have clearance by ATC to taxi past these signs.

B. Distance to FBO is 2,333 feet to the right.

C. FBO is southeast and runway 22/33 is east of your location.

D. The direction towards location of the FBO & runways 22/33.

15. **If, at a non-towered airport, you see an aircraft approaching the runway to land when you are waiting to cross the same runway, you should:**

A. Hold short of the runway until the aircraft is past the point at which you will cross the runway, then proceed when it is safe.

B. Proceed across if the aircraft has not announced its position on the CTAF or UNICOM frequency.

C. Contact the pilot by radio and see if he or she intends to make a touch and go landing.

D. Flash your headlights at the aircraft.

16. **You are driving at a non-towered airport. An aircraft that has announced its position on the UNICOM frequency as 'downwind' is flying:**

A. Perpendicular to the runway after initial climb and turn.

B. Parallel to the runway in the direction opposite landing.

C. An approach to land with the wind instead of into the wind.

D. Any of the above.

17. **If an air traffic controller directs you to do something that you believe is unsafe:**

A. You must comply or face disciplinary action.

B. You should comply and then call your supervisor as soon as possible.

C. You should ask the controller for clarification before complying with the instruction.

D. Flash your headlights and then proceed.

18. **The yellow painted marking at the beginning of this runway indicates:**

A. The pavement can be used for takeoff only.

B. The pavement can be used for landing only.

C. The runway threshold has been relocated.

D. Does not apply to vehicles.

19. **This sign is located on a taxiway. What does it mean?**

A. You must have clearance from ATC to taxi past this sign.

B. Taxiway Bravo is west of your location on the airport.

C. It is a directional sign informing you that taxiway Bravo is the next left turn.
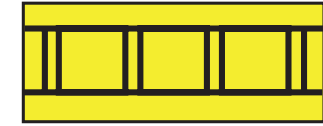
D. None of the above.

20. **If radio contact is lost and the tower signals with a flashing red light, I should:**

A. Stop.

B. Clear the runway or taxiway.

C. Ignore the signal.

D. Return to my point of origin on the airport.

21. **You are driving on a non-towered airport. An aircraft that has announced its position on the UNICOM frequency as "base leg" is flying.**

A. Perpendicular to the runway after initial climb and turn.

B. Parallel to the runway in the direction opposite landing.

C. Perpendicular to the runway about to turn final and land.

D. None of the above.

22. **What does this sign indicate?**

A. This sign next to a taxiway identifies the ILS Critical Area, which you must drive beyond when exiting the runway as directed by ATC.

B. You should be directed by ATC before proceeding beyond this sign.

C. Indicates that you are at a runway threshold.

D. Both A and B.

23. **What do the chevrons at the end of a runway indicate?**

A. The pavement is to be used for takeoff only.

B. The pavement is to be used for landing only.

C. The pavement is not to be used.

D. Indicates the current wind direction.

24. **What is the procedure when you approach these painted markings from the solid line side?**

A. Proceed with caution.

B. No permission needed prior to crossing.

C. You must always have permission from air traffic control prior to crossing.

D. No procedure required.

25. What does this surface painted marking mean?

A. Since it is a single solid & single dashed line, it does not apply to ground vehicles.

B. Divides movement area from non-movement area; crossing solid line requires ATC authorization.

C. It defines the taxiway edge.

D. You can pass other vehicles when you are on the dashed side.

1.	C		16.	B
2.	A		17.	C
3.	A		18.	C
4.	A		19.	C
5.	B		20.	B
6.	B		21.	C
7.	C		22.	D
8.	A		23.	C
9.	B		24.	C
10.	B		25.	B
11.	B			
12.	B			
13.	A			
14.	D			
15.	A			