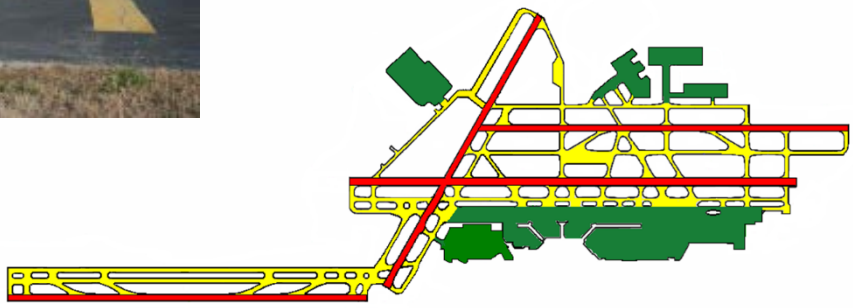
ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Movement Area Driver's Training



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Introduction

The primary concern at St. Louis Lambert International Airport (STL) is to operate a safe and efficient airfield. The purpose of this program is to help protect the drivers of vehicles and their passengers, as well as the flying public. This Driver Training Manual is a tool to familiarize you with the unique problems and safety requirements of working and driving a vehicle on the airport. The material is designed to help operators recognize and avoid conditions that may lead to a catastrophe. This manual will explain some of the things you will see and the rules you will have to follow while working on the airport.

SAFETY IS OUR FIRST PRIORITY!

To achieve this objective it is important that you understand several key elements about the airport environment.

1. Airport basics and definitions.
2. Laws, regulations, security, and local ordinances governing vehicular traffic.
3. Familiarization with the airport layout including the meanings of lights, signs, and markings.
4. Unique problem areas and safety hazards.
5. Proper use of ground control radios and phraseology.
6. Runway Incursions and their avoidance.
7. Emergency procedures and contacts.

A thorough understanding of these elements is the only thing that will keep you and others alive and safe.

All personnel having an official need to drive on the Airport Operations Area must complete this class and display knowledge of the information contained in this manual. All applicants must pass a mandatory written test with a grade of at least 92% before the driving privilege will be granted. Applicants who fail may retake the written test only after additional study and further understanding of the concepts have been displayed. The Airport Authority reserves the right to require any employee to take a practical driving exam with Airport Operations prior to receiving full authorization to drive on the airfield, regardless of exam score. This manual should be kept readily available for future review.

NOTE: Movement area access should only be given to those vehicle operators necessary to conduct airport/air carrier operations. Vehicle operators that only need infrequent access to the Movement Area should request an escort, in advance, through Airport Operations.

Class Pre-requisite

The STL requires any employee who will be responsible for taxiing aircraft to first provide written documentation of at least 4 hours of hands on taxi instruction by an authorized instructor selected by the airline prior to registering for the Movement Area class. The STL Airport Authority expects class attendees to have significant experience not only taxing the aircraft, but operating and communicating in the Movement Area with Air Traffic Control, and be well versed in runway incursion prevention. All class attendees must complete the STL Airport Authority Driver Training Log which is available with the training class schedule memo. Class attendees **must** present completed log to class administrator prior to beginning the Movement Area Driver's Training Class.

Airport Basics

All airports, regardless of whether they serve air carriers, general aviation or both, have common elements among them. It is important to remember that you and your vehicle are considered obstacles to the aircraft utilizing the airport, and you must operate within specific guidelines while on the airport.

Definitions

Airport Operations Area (AOA)—the area located within the perimeter fence that is used or intended to be used for landing, taking off or surface maneuvering of aircraft.

Apron/Ramp— area where aircraft are parked, unloaded, loaded, and refueled.

Escort—authorized person responsible for accompanying, monitoring, directing and controlling the actions of an individual(s) not in possession of a valid Airport Authority issued id badge.

Fixed-Based Operator (FBO)—a person, firm, or organization engaged in a business that provides a range of basic services to general aviation. Services may include fuel, line services, aircraft parking, pilot and passenger facilities, maintenance, etc.

Foreign Object Debris (FOD)—debris such as rocks or trash found on runways, taxiways and aprons that can cause damage to aircraft engines, tires, or skin.

Haul Road—roadway designed to allow vehicles to navigate around the movement area without crossing runways or taxiways.

Instrument Landing System (ILS)—navigation equipment designed to provide an approach path for alignment and descent of an aircraft to a runway.

ILS Critical Area— a designated area surrounding ground based Instrument Landing Systems (ILS) where all aircraft and vehicles must remain clear of to prevent signal interference with an inbound aircraft's ILS instruments.

Incursion—entering any open runway or associated safety area without positive clearance from the Air Traffic Control Tower.

Jet Blast—blast of air produced by an aircraft's engine that is strong enough to turn over a vehicle and/or cause severe burns to a person.

Light Gun Signals—beams of light used by Air Traffic Controllers to communicate with aircraft or vehicles that do not have operable communication radios.

Movement Area—areas where all surface movements are directly controlled by Air Traffic Control and are utilized by aircraft for taxiing, takeoffs and landings.

Non-movement Area—ramp and parking areas that are not under the control of Air Traffic Control.

Runway—a rectangular surface on which aircraft takeoff and land.

Runway Incursion—any occurrence at an airport 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 Safety Area—a defined surface surrounding a runway intended to reduce the risk of damage to an aircraft inadvertently leaving the runway.

Security Identification Display Area (SIDA) — area secured by the Transportation Security Administration where you must display a proper identification badge in an easily viewable area above the waist.

Surface Movement Guidance and Control Systems (SMGCS)—a system of special signage, lighting and markings installed within the movement area to enhance the taxiing or driving capabilities of aircraft or vehicles during low visibility conditions.

Taxiway-surface designed to provide access for aircraft to and from the runways to other areas of the airport including the ramp/apron area.

Vehicle Service Road—any portion of the AOA marked by two white parallel lines designed primarily for the safe and orderly movement of ground vehicles.

St. Louis Lambert International Airport is divided into two distinct areas, the Movement Area, and the Non-Movement Area. A single yellow dashed line with a single yellow solid line painted on the pavement marks the boundary of the Movement/Non-movement Areas. The dashed line will be on the Movement Area side and the solid line will be on the Non-movement Area side.

Movement / Non-movement Line

Non-movement Area

The Non-movement area consists of the airline apron and ramp areas. Anyone authorized to operate a vehicle in this area may do so without being under positive radio contact with Air Traffic Control.

Apron / Ramp Areas

Aprons and ramps are the areas where the aircraft park to be loaded and serviced. Although they vary in size, these areas are extremely busy and can present limited space for vehicular traffic.

You must exercise extreme caution and give your undivided attention to your surroundings while operating a vehicle or walking in these areas. Never drive your vehicle under any part of an aircraft. Additionally, **aircraft under tow or taxiing have the right-of-way over all other vehicles**. Do not assume that the pilots can see you from the cockpit; their visibility downward and to the sides is very limited. Additionally, the pilots' attention may be focused inside the cockpit with before take-off or after-landing checklists instead of watching for vehicular traffic.

Special consideration should be given to aircraft propellers, engine intakes and exhaust outlets. Rotating propellers, even at very low RPM's, can cause severe injury. Never walk through a stopped propeller's arc of rotation. Although you may see airline personnel do this, it is very dangerous.

Jet engine intakes and exhaust outlets should be avoided at all times. At idle power settings there is enough suction at the intake to pick up a human. Exhaust outlets emit jet blast that can exceed 100 miles per hour at temperatures high enough to cause severe burns. Jet blast is quite capable of overturning **any** motor vehicle operating on the ramp. **ALWAYS ASSUME THAT ENGINES CAN START UP AT <u>ANYTIME!</u>**

Movement Area

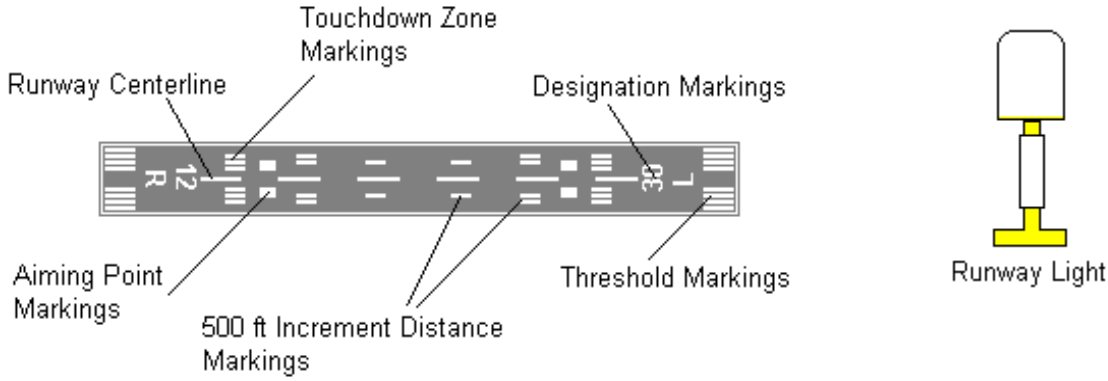
This area includes all of the runways, taxiways, and perimeter access roads within the Airport Operations Area (AOA). The configuration of the runways, taxiways, signage, marking and lighting were designed for aircraft, not vehicles. Because of this, driving on the movement area is considerably different from driving on streets. Finding your way around can be difficult, unless you are familiar with the meaning of markings and signage.

Under no circumstances is any vehicle permitted to operate in the movement area unless the vehicle is properly equipped with both STL ground frequencies and an operable beacon, and the driver is certified in the proper operating procedures by the Airport Authority.

To ensure safety, positive control of all vehicles in the movement area must be maintained at all times. The vehicle operator must establish and maintain direct communications with the ground controller in the control tower and receive clearance to enter the Movement Area. The vehicle operator has the sole responsibility to be aware of his or her exact location with respect to runways and taxiways at all times and to follow the controller's instructions exactly as given.

Runways

Runways are the areas where aircraft land and take off. The most important thing to remember about runways is that they are meant for the exclusive use of aircraft. You should never walk or drive on a runway unless you, specifically, are authorized to do so by the ground controller in the air traffic control tower (ATCT).



Runways are named or designated with numbers relating to the magnetic compass direction with which they are aligned. These designation numbers are marked in white paint and are located at each end of the appropriate runway. For example, a runway facing west corresponds with a compass heading of 270 degrees. By omitting the zero at the end, the runway is designated Runway 27. Consequently, the opposite end of the runway, facing east, has a magnetic compass heading of 90 degrees and is designated Runway 9. Remember, the Air Traffic Control Tower always refers to a runway by the end from which the aircraft are landing and taking off regardless of the direction **you** may be traveling on the runway.

Some airports have runways that are aligned with each other; in this case they are designated as parallel runways. In these cases the runways share the same numeric designation but are differentiated by using left, center, or right; e.g. 12R/30L, 12L/30R. The numeric designations and an "L", "C", or "R" are painted at the appropriate runway end.

Runways are marked with white painted stripes. The stripes are solid white along both edges of the pavement and a dashed white stripe down the center. Additional markings may include white threshold stripes located at both ends of the runway and white touchdown zone and aiming point markings that are located at various points along the entire length of the runway. For night or low visibility operations the runway is highlighted with white lights along the edges and along the centerline. Additional lighting may include amber edge lights with red centerline lights that denote the last thousand feet of the runway, white touchdown zone lights and red/green threshold lights.

The signs associated with runways are the Runway Distance Remaining Signs. These signs have white numbering on a black background. They provide pilots with information about distance of runway remaining in 1,000 foot increments.

Runway Distance Remaining Sign

Runway Safety Areas

Runways are surrounded by safety areas that are designed to provide an increased level of safety for aircraft landing and taking off. The runway safety area extends 250 feet either side of the runway centerline and 1,000 feet beyond each end of the runway.

The purpose of the runway safety area is to minimize injury to persons and damage to aircraft if they inadvertently leave the runway. Federal Regulations require that no objects be in the runway safety areas except those that are frangible and fixed by function. This means signage, lighting, and Navaids, not personnel, vehicles or equipment. For that reason, a runway safety area must be kept sterile.

The red and white runway hold position signs are accompanied by double solid and double dashed yellow pavement stripes with a black background. Together these markings and signs form the protective box or boundary around the runway called the Runway Safety Area.

Runway Hold Position Sign

Runway Hold Position Marking

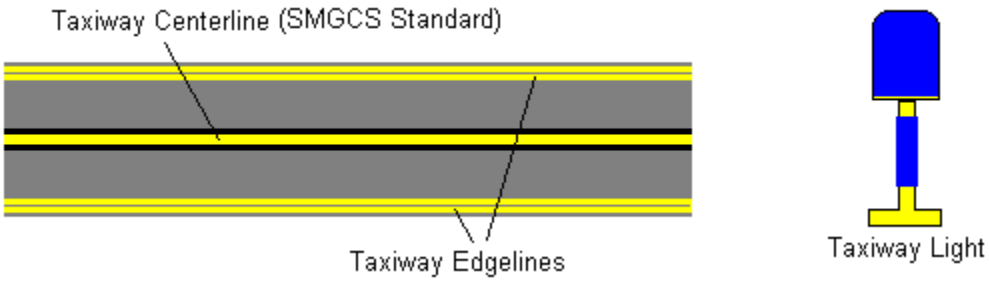
To increase safety, airports have installed elevated runway guard lights (commonly referred to as “wig-wags”), to accompany the runway hold position marking and signs at runway/taxiway intersections. These are designed to help pilots and vehicle operators recognize the boundary of the Runway Safety Area.

These signs, markings and lighting should be treated as stop signs. They indicate to pilots and ground vehicles where to stop prior to getting permission from the control tower to proceed onto a runway. **No vehicle or person may enter the runway safety area unless the runway is closed. People and vehicles are not allowed inside the runway safety area while aircraft are landing and departing.**

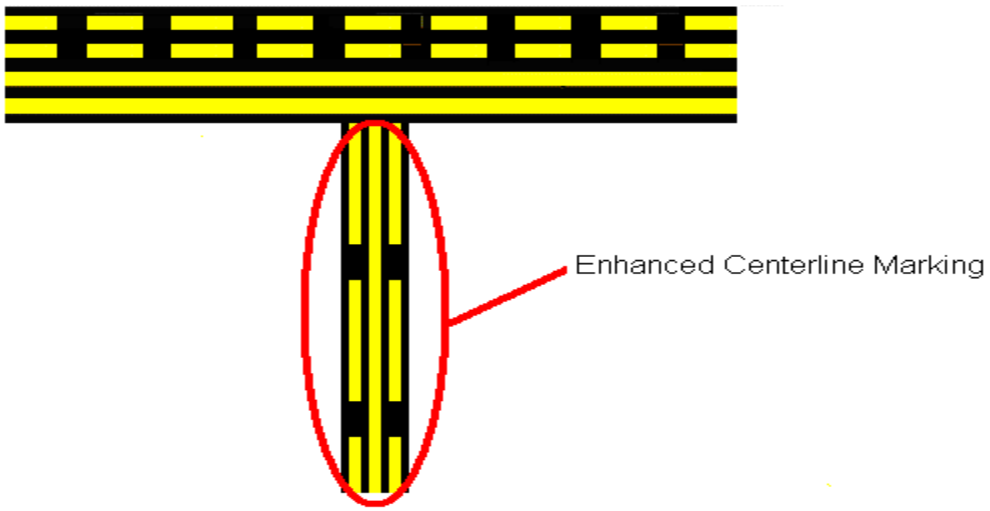
At times the tower may require you to move your vehicle out of the way for aircraft exiting a runway. When you approach the runway safety area, stop your vehicle well short of the actual markings and signs in order to give yourself enough room to maneuver **without** going over the line. Likewise, when you are exiting a runway, make certain your vehicle is **completely** past the runway hold position markings before reporting clear of the runway.

Taxiways

Taxiways are used by aircraft to move to and from gates and parking areas to the runways and vice versa. As with runways, you should never walk or drive on taxiways unless you are authorized to do so by the ground controllers in the Air Traffic Control Tower.

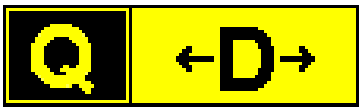


Taxiways are marked with double solid yellow edge stripes and a solid yellow centerline. At STL, the solid yellow centerlines are enhanced on either side with yellow dashed lines (Enhanced Taxiway Centerline Marking) leading up to the runway hold position markings. This is to better define runway safety area during low visibility operations. For night operations, taxiways are marked along the edge with blue lights and may be equipped with green centerline lights.



Taxiways are designated with alphabetic or alpha-numeric identifiers such as A, B, or B-1 and so on. These designations are placed on signage mounted at intersections adjacent to the corresponding taxiway. Different types of signs associated with taxiways include location signs, direction signs, and hold position signs.

Location signs have yellow letters on a black background and tell you what taxiway you are currently on. Direction signs have black letters on yellow backgrounds. Direction signs will also have an arrow or arrows to show you the approximate direction you will need to turn to get to that taxiway.



Taxiway Location
& Direction Sign

Taxiway location and direction signs may also be grouped in clusters at complex intersections. In this case, the location sign may be in the middle of the cluster with all direction signs for taxiways requiring a left turn mounted to the left side of the location sign. Likewise, all direction signs for taxiways requiring a right turn will be mounted to the right side of the location sign.

Taxiway Location and Direction Sign
(Complex Intersection)

Hold position signs are utilized to mark areas that require you to receive further clearance in order to enter. Examples are runway hold position signs and ILS critical-area hold position signs. These signs are made up of white letters on a red background. Treat these types of signs as you would an ordinary stop sign. However, **in order to proceed past these signs you must first have clearance from the ground controller.**

Runway Hold Position Sign

ILS Hold Position Sign

Likewise, a solid yellow “ladder” type pavement marking accompanies the ILS Hold Position sign. This sign and pavement marking combination denotes the boundaries of the ILS Critical Area.

ILS Hold Position Marking & Sign

In general, these areas are the places that all vehicles must remain clear of when the Instrument Landing System (ILS) is in use. Vehicles and radios in these areas can cause errors in the signal being transmitted to an aircraft on short final for landing. **The critical areas are in effect anytime the ceiling (clouds) is less than or equal to 800 feet and/or the visibility is less than or equal to 2 miles. You must receive clearance from the Air Traffic Control Tower to enter the critical areas under these conditions.** To determine if the critical areas are in effect, you can call the St. Louis Airport Authority Operations Center at 314-426-8040. The IS critical areas are depicted by the red shaded areas at the ends of each runway on the airfield map provided with your class materials.

In addition to the ILS critical areas, an intermediate hold position marking is in place on Taxiway Charlie and on Taxiway Delta near Taxiway Victor, marking the boundary of the Precision Obstacle Free Zone (POFZ) for Runway 12R. The intermediate hold position marking is characterized by a dashed yellow line outlined in black running the full width of the taxiway. This marking denotes the boundary of an area designed to protect aircraft flying a precision approach, from ground vehicles and other aircraft during poor weather. **In general, the POFZ is in effect anytime the ILS critical areas are being protected (see above).**

Intermediate Hold Posiiton Marking

Service Roads / Perimeter Access Roads / Haul Roads

Perimeter access roads or haul roads allow vehicle operators the ability to navigate around the movement area without crossing runways or taxiways. Runway safety areas and/or ILS critical areas overlap the perimeter access roads at the ends of the runways. When the weather is above 800 foot ceilings and greater than 2 miles visibility vehicles may drive around the approach/departure ends of the runways. However, if there is an aircraft on final approach for landing, or beginning its take-off roll, you must stop at the stop sign and wait for the arriving/departing aircraft to pass before proceeding. When weather conditions are at or below 800 foot ceilings and/ or 2 miles visibility, you may not use the perimeter access roads without clearance from ATC.

Many portions of the service roads that you will encounter on the airfield, enter into a taxilane, taxiway, or even into a runway safety area. All of these roads have signage with instructions that must be followed. The following are signs that you will come across on service roads:

Vehicle Road entering a Taxilane. Stop and Give Way to Aircraft Before continuing.

Vehicle Road entering a Runway or a Runway Safety Area. Stop and get further clearance from ATC before Proceeding.

Vehicle Road entering a taxiway.

Security

The Security Identification Display Area(SIDA) requires everyone to have an airport approved identification badge displayed at all times. The two exceptions to this are 1) flight crew personnel who must have airline badges displayed and may only be in the shadow of the aircraft they are assigned to and 2) passengers boarding flights are not required to have SIDA badges. SIDA badges are color coded to the area the person has permission to be in. At every SIDA door or gate, each person entering must use their ID badge and enter a pin number for access. If someone has access to the non-movement area, and needs to have access to the movement area, they must be escorted by someone with movement area privileges. SIDA badges must be displayed at all times regardless of job duties. The SIDA badge must be displayed below the neck and above the belt. All SIDA badge holders are responsible for challenging a person without a SIDA badge displayed. If a person does not have a SIDA badge they must be escorted by someone with a SIDA badge having appropriate access to that area. Anyone violating these requirements **will have their access revoked**. No person with an airport approved SIDA badge may be escorted into an area they have access to. For example, if a person forgets their badge at home or they lose their badge, they may not be escorted into the SIDA area. Any person/persons caught ‘sharing’ badges will lose access privileges. With cooperation from all SIDA badge holders we make the airport environment a safe place.

Escorting

Any person that needs to work in the SIDA that does not have a SIDA ID badge must be escorted. An escort is responsible for all actions of the individual being escorted while on Airport property. A person escorting cannot authorize access to areas above his/her own clearance. Pedestrians being escorted should never be left unattended in the SIDA; the escort should be able to see, talk to and hear persons under escort. All persons under escort must be logged in by security personnel, and also logged out by security personnel at original access point. All groups under escort must be within reasonable size for the person escorting to be responsible for.

Vehicles may also be escorted into the SIDA through specific manned access points. Personnel authorized to escort must display their Airport ID badge. Visitors must display a government issued photo ID, such as a driver's license. Also, escorts must log in and out with security personnel at manned entry/exit points. The escort does not need to ride in the escorted vehicle but must stay within reasonable distance to prevent the escorted vehicle from veering off course. When escorting a vehicle you are responsible for the safety of that vehicle! Ensure that the people/vehicle that you are escorting understand to follow your exact direction while on the AOA at all times. **You must brief the people/vehicles being escorted about these procedures**.

Anyone that needs an escort from the St. Louis Airport Authority must schedule it a minimum of 24 hours in advance. Any emergency type of event may supersede availability to give an escort.

Vehicle Requirements / Operating Rules

A high percentage of accidents in aviation occur on the ground. Failure to observe safety rules is certain to cause problems. Observance of common sense rules is generally sufficient, but there is little chance that anyone will comply with rules, however reasonable, if they are not sincerely concerned with safety.

The most important action you can take to help ensure your safety and the safety of others is to learn the layout and configuration of the airport. Take time to review the airfield maps and materials that are given to you. The time to learn which taxiway is where or what runway it is near, is in the comfort of a chair, not in the middle of trying to interpret the tower's instructions. The airport is constantly changing and expanding, so make sure you have current maps and information.

Vehicle operators are responsible for ensuring their vehicles are in safe working order. Before operating, conduct a walk around inspection. Check the operation of all lights, including the operation of the rotating or flashing beacon. Check the loading of the vehicle for any loose objects. Know the height of your vehicle as well as the areas under which your vehicle will not clear.

St. Louis County Ordinance Sec. 721 only allows for vehicles authorized by the Airport Authority to be on the AOA. **Unauthorized entrance of bicycles, hover boards, segways, and other private motorized vehicles on Airport property is prohibited** and in violation of this county ordinance.

The following rules shall be followed while operating a vehicle on the AOA:

- ✈ No vehicle shall be operated in a careless or negligent manner.

- Rotating/Flashing amber beacon must be located on the upper-most portion of the vehicle (if driving in the Movement Area)
- Use of a cell phone while operating a vehicle on the AOA is strictly prohibited.
- Vehicle drivers must yield to all aircraft. Moving aircraft and passengers enplaning and deplaning aircraft shall have the right-of-way at all times over all vehicles, including emergency vehicles.
- Speed limits shall be obeyed at all times on the ramp.
- Vehicles shall not deviate from the vehicle roadway unless it is blocked by aircraft or for an operational necessity.
- Vehicles are not to be driven under any portion of an aircraft unless servicing that aircraft.
- Vehicles are not to be driven or parked under a loading bridge at any time.
- When parking a vehicle, do not block a driveway, gate, aircraft or fire lane. Only park in authorized areas.
- Do not use headphones/earbuds while operating a vehicle on the AOA.
- All other Federal, State and local laws apply while operating a vehicle on the AOA.
- All vehicles on the AOA must have identifying placards on them.
- When inside the secured area, vehicles **must be** parked at least 4 feet away from the AOA perimeter fence.

For night and low visibility operations, all vehicles must have working headlights and taillights.

Before driving on the movement area, it is a best practice to obtain the current airfield conditions. You are required to know the following **prior to** driving on the movement area:

- Runway configuration
- Weather conditions

These basic pieces of information can be found on the Automatic Terminal Information System (ATIS). You can access the ATIS by phone at 314-890-4777 or via your ATC radio on 125.025.

Knowing this information prior to driving on the movement area will greatly help you to navigate around the airfield.

You can also review the most up-to-date **Airfield Condition Report** online at www.flystl.com/acr to learn about any closures, conditions, and Notices to Airmen (NOTAMs).

Working on the AOA

STL Airport Operations **must be notified prior** to any scheduled or unscheduled work being conducted on the AOA. Any work that requires a closure of some portion of the AOA must be requested **at least** 48 hours in advance to allow for proper coordination. Work zones on the movement area must be barricaded to prevent inadvertent entry by aircraft and to define the limits of the work zone to personnel working. Personnel working in the Movement Area must maintain radio communication capabilities with the Air Traffic Control Tower **at all times**.

Surface Movement Guidance and Control Systems (SMGCS)

The acronym “SMGCS” stands for Surface Movement Guidance and Control Systems. The SMGCS policies were derived by a St. Louis working group, so that air traffic control (ATC) can safely direct aircraft and ground vehicles during inclement weather. According to Federal Aviation Administration Advisory Circular 120-57, U.S. airports with air carriers must use SMGCS when the visibility is low. To be exact, the SMGCS plan goes into effect when the visibility is less than 1,200 feet runway visual range (RVR). The SMGCS plan requires ATC to have strict control procedures and the airport to implement enhanced visual aids. All of these aids must be in proper working order. All of the vehicle’s lights and beacons must be in proper working order as well when SMGCS is in effect. **It is the operator’s responsibility to ensure their vehicle is in proper working order.** Personnel should only consider being on the airfield in emergency situations when the SMGCS plan is in effect. When operating a vehicle on the Airport Operations Area (AOA) during low visibility, it is imperative to always use EXTREME caution and to never get complacent. The most important aspect to remember is that the purpose of the SMGCS plan is to keep the aircrafts’ take-off and landing operations running smoothly and safely.

Foreign Object Debris (FOD)

Sharing the responsibility

Foreign Object Debris is anything an aircraft engine can ingest and cause damage to its internal components. Debris can also puncture tires, jam into moveable parts or dent or puncture the aircraft skin. A rock picked up by a propeller can damage the propeller as well as become a deadly projectile.

FOD is everyone’s responsibility!

You can help make the airport a safer place by following these basic rules:

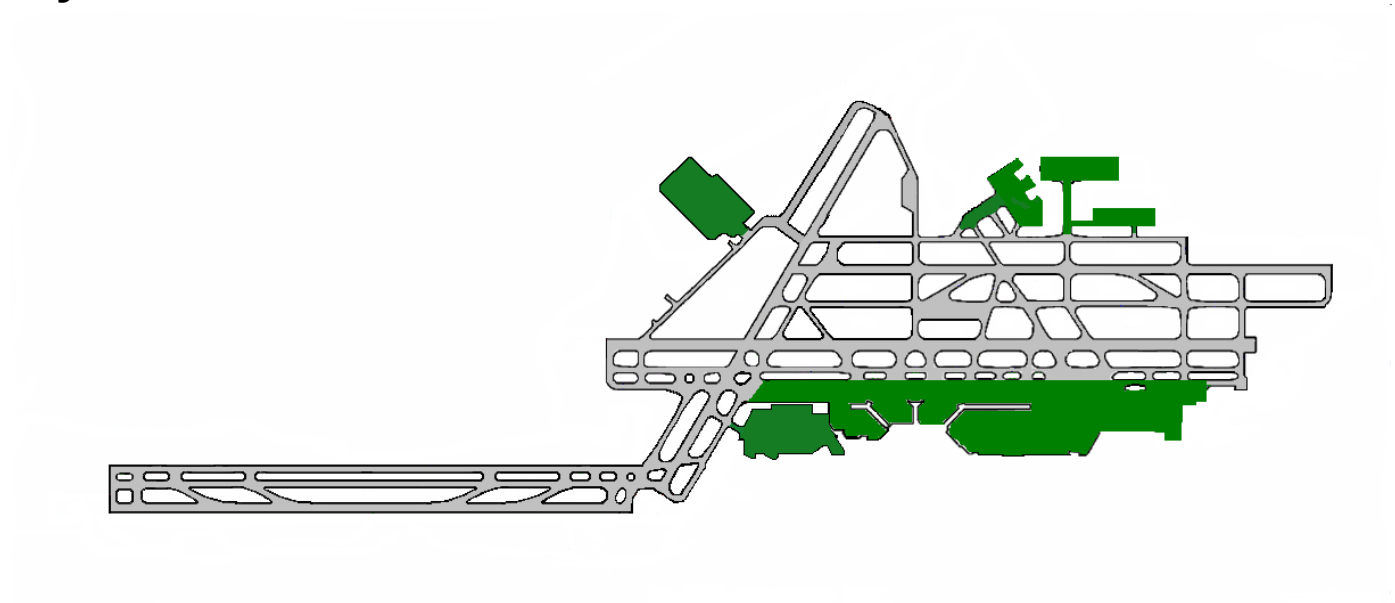
- Get in the habit of picking up all trash or rocks lying around on the ground.
- Keep an eye out for nails, bolts and other small metal pieces that can puncture tires or be picked up by an engine.
- Pick up plastic bags and paper instead of letting them blow across the field.
- Keep track of all tools or equipment that are used while on the AOA.
- Always try to avoid tracking mud and rocks onto the paved surfaces.
- Put all trash in a covered container that will not be blown over.

Hazardous Materials (HAZMAT) Spills

When a spill occurs (regardless of size/amount), clean up procedures need to be started immediately to decrease the spread of spilled material. Extra caution needs to be given to spills that are near drainage systems so that the spill can be directed away from it or blocked properly. Per Federal Aviation Regulations Part 139, all spills need to be reported to the Airport Operations Center as soon as safely possible.

Spills must be cleaned up and waste must be disposed of properly keeping in mind all Federal, State, and local regulations.

Familiarization with St. Louis Lambert International Airport Layout



At STL, the Non-movement Area is comprised of the aircraft apron and ramp areas located along the north side of the terminal/concourse complex, the south side of Signature Aviation, the Haith cargo facility, the Boeing ramp and the ATS Jet Center. It is not necessary to establish any communication with the tower or to receive any clearance to operate a vehicle in these areas.
Although these areas are within the fenced boundaries of the airport, they are considered St. Louis County roads.

Speed limits have been established and are enforced by the Airport Police and Airport Operations. The speed limits are as follows:

Ramp area:	15 mph
Baggage Tunnels:	5 mph
Gate areas:	walking speed

Drivers of vehicles on the ramp areas are required to use the vehicle roadways that are painted on the pavement.

Special consideration should be given to the following areas of the Non-movement area:

1) **Vehicle roadways.**
The vehicle roadways can be dangerous because of their close proximity to the airfield and to the aircraft parked along the concourses. Beware of aircraft entering the ramp from the airfield. Anytime you are crossing one of the intersections, make certain to look behind you to make sure an aircraft is not turning in your direction. **An aircraft always has the right-of-way!** In addition, beware of jet blast from aircraft pulling up to the gates or beginning to taxi to the runways. Watch for flashing red anti-collision lights on the top and bottom of the fuselage of the aircraft. These lights are illuminated whenever the engines are running or when ground personnel are performing

maintenance checks. They will also be illuminated when maintenance personnel perform work that requires the wing flaps, slats, and landing gear doors to be operated.

The vehicle roadway on the Charlie Pad has been relocated to the North side of the pad. The nose of aircraft that park on the pad abuts the vehicle roadway and aircraft will be taxiing on the North side of the vehicle roadway. Vehicle operators should use extreme caution for aircraft wingtips that are taxiing on Taxilane C and aircraft entering and exiting the Charlie pad. The roadway also runs next to the Movement/Non-Movement line on the West end of the pad. This line cannot be crossed without permission from the Air Traffic Control Tower.

Aircraft holding spots are also located along the vehicle roadways on the ramp. These spots are painted on the pavement and consist of a 5 feet diameter yellow circle spot and a numeric identifier. The numeric identifiers begin with 1 (one) on the East end of the airline ramp and count up, moving West, ending with 19 (nineteen) near the Charlie Pad. Pilots use these as reference points for their location on the ramp when contacting the ground controllers for taxi clearances. Try to avoid staying in the area of these spots for an extended period of time since aircraft tend to concentrate at these locations.

2) **Ramp area around gates C5 & C7.**
Cape Air and Air Choice One operate smaller propeller driven aircraft in this area. These aircraft can be difficult to see at night or during periods of low visibility. Once the aircraft are clear of the airfield, many of the pilots turn off their taxi lights, further decreasing your ability to see them clearly. This, accompanied with a high rate of speed, can easily result in a dangerous situation.

Also, if your work requires you to access the gate area immediately around the C concourse next to gates C5 & C7, be aware that the jet bridges at this location are not in use. Because of this, passengers are required to walk along the ramp to enter or exit the C concourse. Remember: **Never Drive Through A Line Of Passengers!** You must wait until the last passenger has passed before proceeding.

3) **Terminal 2 (East Terminal).**
This portion of the Airline Ramp sees a lot of traffic. Be cautious in this area as Southwest Airlines controls their own pushbacks and you will not hear them pushing back over the Ground Frequency. Due to high activity of flights, there is also a high number of ground service equipment moving in/around this area. Southwest Airline pilots are also notorious for taxiing at high rates of speed.

4) **Area between C and D concourses (the "Back Alley").**
This area can be extremely tight. A vehicle road runs along each concourse near two taxi lanes putting you and your vehicle in close proximity to wing tips, and jet blast. The most dangerous aspect of this area is the aircraft traffic executing tight, high power turns to and from the gates. In addition, there is equally dense vehicle traffic traveling from gate to gate. Always use extreme caution while driving in this area.

5) **A, B, and C concourse bridges**
These are located along the north side of the Terminal 1 (Main Terminal) at each concourse. Clearance limits are as follows:

A-concourse	7 feet, 6 inches
B-concourse	7 feet, 10 inches
C-concourse	7 feet, 8 inches

Ensure your vehicle can clear the heights of the concourse bridges **before** driving under them.

6) **Terminal 1 and Terminal 2 (Main and East) bag rooms.**
The bag rooms, under Terminal 1 and Terminal 2, present problems with both low clearance and narrow drive lanes. If your vehicle is larger than a small pick-up truck, it is not recommended that you drive in the bag rooms. You will need to park outside on the ramp and walk into the area.

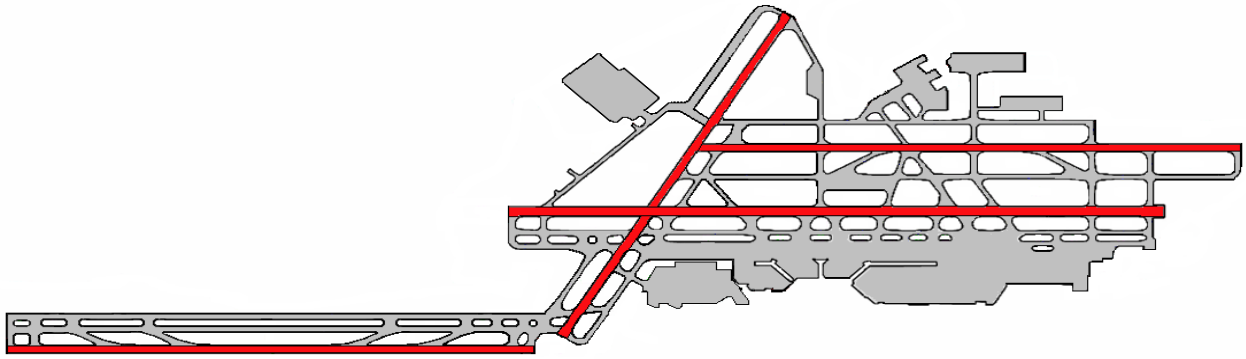
If you do enter the bag rooms with your vehicle make sure that any roof mounted lights or antennas will clear the overheads. Park your vehicle in designated areas only, as space is very limited. Do not block any drive lanes, baggage conveyors or doors.

7) Lima Pad (Between the End of C- Concourse and Terminal 2).
Driving a vehicle across the Lima Pad is strictly prohibited. To ensure the safety of vehicles and aircraft, all vehicles must use the vehicle roads that are located north and west of the Lima Pad.

The Movement area at STL consists of the runways, a complex taxiway system, and the perimeter access roads located within the perimeter fencing.

St. Louis Lambert International Airport has 4 runways that are identified as follows:

1.	12 Right-30 Left	11,019 ft x 200 ft
2.	12 Left-30 Right	9,003 ft x 150 ft
3.	11-29	9,001 ft x 150 ft
4.	6-24	7,602 ft x 150 ft



The dimensions of the safety areas for the runways are 500 feet wide, centered on the runway centerline, extending 1000 feet from each end.
There are additional areas in the movement area that require special attention on your part.

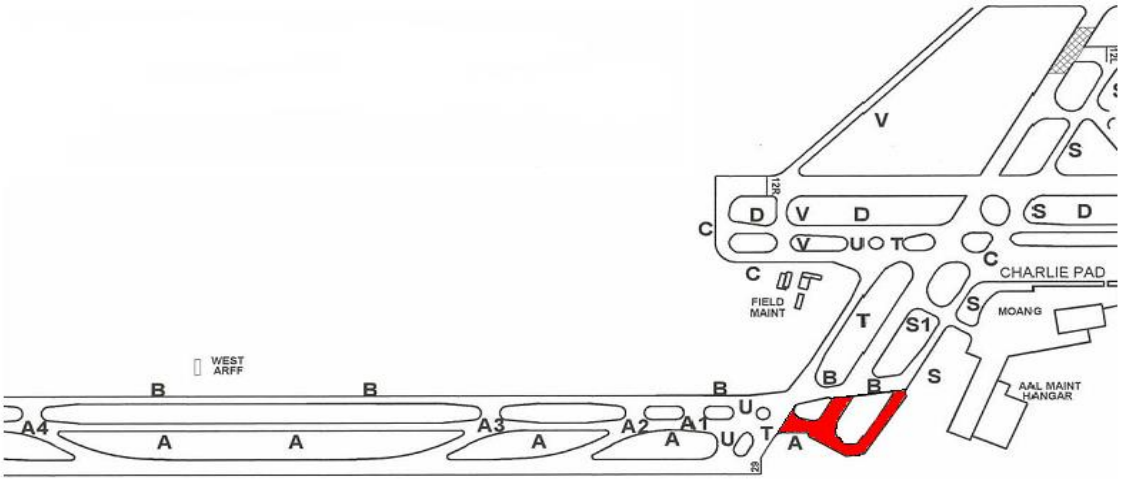
1) Taxiways A2, A3, A4, A5, E1 & E2.

These taxiways are called acute angle or high-speed taxiways. They are designed to allow landing aircraft to exit the runway at higher speeds than normal taxiways would permit. Taxiways A2, A3, A4 & A5 are located along runway 11-29. Taxiways E1 & E2 are located on the south side of runway 12L-30R. **These taxiways are to be treated as runways. You must receive specific clearance from the tower to drive on them.** As a reminder, these taxiways have red and white "Do Not Enter" signs located at the beginning of each taxiway. **Do not** drive past these signs without permission.

2) Papa Pad and Echo Pad.

When certain types of maintenance activities are performed on aircraft, the operator of that aircraft must test the engine prior to the next flight to ensure all systems are working properly. This type of test is known as an engine run-up or engine run. An engine run consists of a stationary aircraft powering up its engines, sometimes to maximum power, while the systems are monitored for the proper readings. When these tests are conducted, the aircraft can produce large amounts of jet blast for extended periods of time. At St. Louis Lambert International Airport, engine run-ups are conducted on the Papa Pad during daylight hours (6:00 a.m. – 11:00 p.m.) and on the Echo Pad during nighttime hours (11:00 p.m. – 6:00 a.m.). As with any aircraft, the jet blast from an aircraft running up its engines can be dangerous to vehicles and personnel; use extreme caution when operating in the vicinity of an aircraft when they are parked in either of these areas.

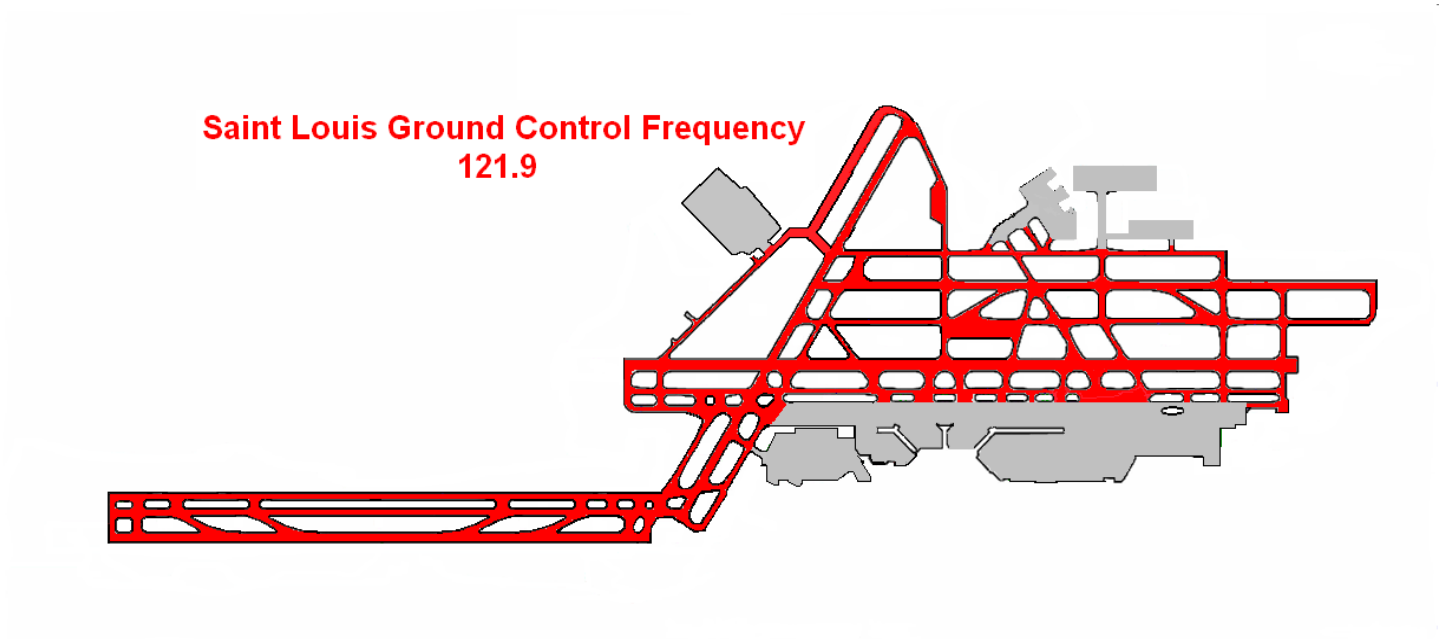
3) Runway 11-29 Extended Centerline



Vehicles operators must obtain approval from ATC prior to entering the shaded area depicted. This area is considered a runway safety area and, it must remain sterile during aircraft operations on runway 11-29.

Radio Communications and Phraseology

As a potential driver on the AOA, your job duties require you to communicate with the Air Traffic Control Tower (ATCT) and the Airport Operations Center. Ground Control frequencies are used by ATCT to communicate with aircraft and vehicles that are in the movement area on the AOA. Vehicles that enter and exit the movement area must establish and maintain two-way radio communications using the ground control frequencies. At STL, the ground control frequency used is 121.9.



You are required to know and use standard aviation phraseology and communications techniques when communicating with ATC ground radio. Good phraseology enhances safety and is a mark of a professional. Slang, chatter and police "ten" codes have no place in ATC communication. Quality communication can only occur when each party knows and understands what the other is saying.

Because some letters can sound alike over the radio such as: "B", "C", "D", etc. you are required to use the aviation phonetic alphabet to reduce the chances of confusion.

A – Alpha
B – Bravo
C – Charlie
D – Delta
E – Echo
F – Foxtrot
G – Golf
H – Hotel
I – India
J – Juliet
K – Kilo
L – Lima
M – Mike
N – November
O – Oscar
P – Papa
Q – Quebec
R – Romeo
S – Sierra
T – Tango
U – Uniform
V – Victor
W – Whiskey
X – X-ray
Y – Yankee
Z – Zulu

You are required to contact the FAA ground controller each and every time you enter and exit the movement area. All communications will have at least four components.

1) State who you are calling.
2) State who you are.
3) State where you are.
4) State what you want to do.

When entering the movement area, you must relay to STL Ground Control what portions of the movement area you need to drive. For example: “Request permission to drive the West Airfield taxiways” or “Taxiway Delta”. **Blanket clearances for the entire movement area or all taxiways are not authorized.**

Before you begin talking on the radio think about what you are going to say. Wait at least 5 seconds before speaking to ensure you do not “step” on another radio transmission. It is essential that you are brief and to the point when talking on the ground radio.

Listen and be prepared to provide the ground controller with additional information about the work you will be performing and the amount of time it will take you to complete the work if asked. Always acknowledge all communications so that the ground controller knows that you have received the message.

The controller will approve, deny, or issue special instructions for your request using the following phraseology:

Acknowledge – Let me know you have received and understand this message.
Advise Intentions – Tell me what you plan to do.
Affirmative – Yes
Off – No longer located on or in something (Off of runway 6/24; the movement area).
Confirm – My version is…is that correct?
Go ahead – State your request (Never means “proceed”).
Hold – Stop where you are.
Hold short of – Proceed to but hold short of a specific point.
Negative – No, or permission 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 and understand all of your last transmission (NOT to 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 – Inability to comply with a specific request, instruction or clearance. I cannot do it.
Verify – Request confirmation of information.
Wilco – I have received your message, understand it, and will comply.
Without delay or Expedite – Proceed with approved instructions in a rapid, but safe manner.

If the controller issues any **holding** instructions, **you are required to read back the holding instructions word-for-word.** You are also required to read back any instruction given to you by ATC. The following are examples of typical communications between vehicle and the ATCT:

An example of a request to enter the movement area is as follows:

You: Ground control, truck 307, request permission to enter the movement area at Taxiway Charlie and Quebec to work on taxiway lights along Taxiway Charlie.

GC: Truck 307, ground, proceed as requested, remain clear of Runway 30 left at all times.

*You: P*roceeding as requested, and will remain clear of Runway 30 left, truck 307.

An example of a request to cross runway 12R at Taxiway Romeo is as follows:

You: Ground control, Truck 106, at Taxiway Romeo to cross Runway 12 right.

GC: Truck 106, Ground Control, cross Runway 12 right at Taxiway Romeo

You: Crossing Runway 12 right at Taxiway Romeo, Truck 106.

Or

You: Ground control, truck 106, at Taxiway Romeo to cross Runway 12 right.

GC: Truck 106, ground control, hold short Runway 12 right at Taxiway Romeo, traffic on short final.

You: Hold short Runway 12 right at Taxiway Romeo, truck 106.

****All runway crossings or runway access require advance permission from Air Traffic Control, regardless of whether or not the runway is open or closed.****

The following is an example of communications needed to drive on to runway 30 right to retrieve FOD, then clear the runway.

You: Ground, Ops 17, holding short of Runway 30 right at Taxiway Juliet to retrieve FOD on Runway 30 right.

GC: Ops 17, ground control, proceed on Runway 30 right, traffic 5 miles out, report when clear of the runway.

You: Proceeding on Runway 30 right, will report clear of the runway, Ops 17.

(After retrieving FOD and clearing the runway)

You: Ground control, Ops 17 is off of Runway 30 right.

GC: Ops 17, ground control, roger.

An example of multiple vehicles crossing a runway or driving in the movement area:

You: Ground Control, Ops 17 ***plus 4 vehicles,*** *on Taxiway Delta to cross Runway 24.*

GC: Ops 17 plus 4, Ground Control, cross Runway 24 on Taxiway Delta.

You: Crossing Runway 24 on Taxiway Delta, Ops 17 plus 4.

** ***If there are multiple vehicles with you, you must indicate the number of vehicles to ground control by stating your call sign then the word "plus" followed by the number of vehicles with you. You must be accountable for all of those vehicles. The old "and company" (Ops 17 and company) terminology is no longer acceptable.*** **

Note for crossing runways: Drivers should avoid crossing runways unless it is operationally necessary. The procedure of crossing a runway to get to a destination should never be used as a shortcut. When it is necessary to cross a runway, you should avoid "high energy/traffic" intersections i.e. intersections with a lot of congestion or activity.

These examples represent only a small fraction of the possible scenarios you will be encountering in your day-to-day communications with the tower. Use them as guidelines to help with your specific situations. Most importantly, think before you speak. If you ever get confusing or conflicting instructions, **get clarification from the tower.** Do not cross or travel on any part of the movement area unless you are absolutely certain you have received specific permission. **DO NOT ASSUME ANYTHING.**

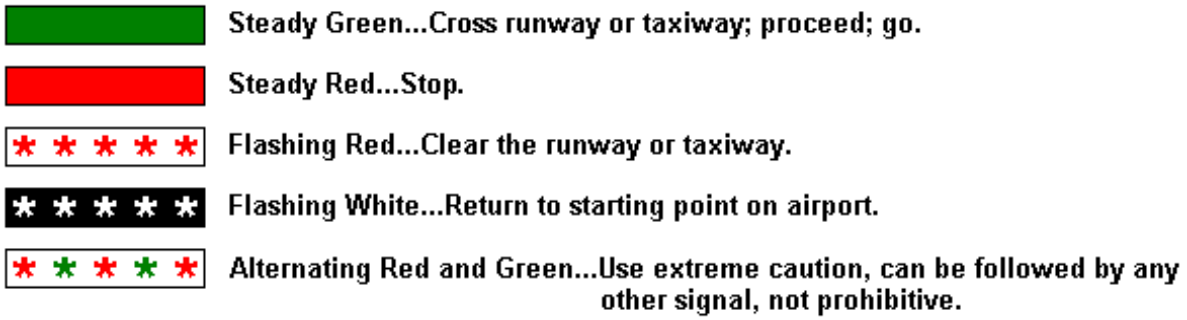
If at any time you need to step outside your vehicle while in the movement area, you *must* contact Ground Control and notify them of your location and intentions. They may either approve or deny your request.

Finally, we will address the procedures you are to use should you experience radio failure while you are in the movement area. Be alert to the sound or lack of sounds in your receiver. Check your volume, recheck your frequency and make sure that your microphone is not stuck in the transmit position.

You should try to exit the movement area **without crossing any runways.** Many areas of the airfield give you access to the perimeter/service road. If this is not possible, try to contact the Airport Authority Operations Center by using either the Airport Authority radio or mobile phone. Someone will be dispatched in a vehicle to escort you off of the field.

Should you be unable to receive help in this manner, turn your vehicle toward the Control Tower and flash your headlights. The controller in the tower will respond with instructions using a color-coded spot light, also known as a light gun. You should never use this procedure while located on a runway. **Always clear a runway in the event of a radio failure**.

Light gun signals are to be interpreted as follows:



After receiving a light gun signal, acknowledge the instructions by flashing your headlights. If you have forgotten the signals or do not understand them, drive your vehicle into the adjacent grass area and wait for an escort vehicle to assist you.

Runway Incursions

A runway incursion is defined by the FAA as a*ny occurrence at an airport 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.*

Incursions are classified into three groups:

1) Controller Operational Errors
2) Pilot Deviations
3) Vehicle/Pedestrian Deviations

The main factors that lead to runway incursions involving vehicles are from misunderstood controller instructions, confusion, disorientation and complacency. Fatigue and lack of sleep can increase your risk while driving on a large complex airfield, especially at night. These human factors are completely controllable by every individual working in the aviation environment.

Although most runway incursions do not result in an accident, the potential is always there, especially in low visibility situations. As you have read throughout this manual, it is **your** responsibility to be aware of your surrounding environment and the impact **you** could potentially have.

If working on an airport is new to you, learn from experienced coworkers about your work area and the potential hazards around you. Knowing your location, the correct procedures for accessing the work site, and how to communicate properly is the best defense against your creating an incursion.

Some other important ideas that will help reduce the likelihood of runway incursions and accidents are:

- ✈ Ensure your radio's volume is set at an audible level
- ✈ If working outside or away from your vehicle:
    i. Use an external speaker or portable/handheld ATCT transceiver so can still communicate with the ATCT.
- ✈ Avoid using cellular phones while operating in the movement area
- ✈ Avoid unnecessary conversations within the vehicle
- ✈ Keep a good look outside for aircraft operating within the vicinity
- ✈ Use your vehicle lighting to make you as visible as possible to aircraft and vehicles

Even, if you are celebrating two years or two decades of safely working in the airport environment, **DO NOT GROW COMPLACENT!** Several incursions over the past few years have occurred where experienced employees who thought they knew where they were and what they were doing only to hear the dreaded words from the controller, "Give the tower a call when you clear the field". Worse yet, these individuals could have been the cause of many fatalities, including their own.

A runway incursion is a Federal offence. The FAA and the St. Louis Airport Authority will take appropriate enforcement action based on the severity of each offence. The Airport Authority reserves the right to impose any or all penalties it deems necessary.
The minute you start to feel comfortable driving on the airfield, you are dangerous!

STAY ALERT!!!

Best Practices for Airfield Safety - Vehicle Drivers

- Review and understand airfield signage and markings.
- Review the 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 in the operational area. Flashers and beacons help ATC, aircrew and other vehicle operators see vehicles in the operational 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 correct terminology and proper voice cadence.
- Copy your clearance and review the assigned route. Read back all clearances.
- Eliminate distractions while driving in the operational area. Do not use cell phones while driving in the operational area.
- Focus attention and have your "eyes out" of the vehicle.
- Maintain appropriate speed.
- Be alert to similar aircraft and vehicle call signs operating on the field.
- STOP the vehicle on the taxiway and request ATC clarification if there is confusion regarding your position or your clearance.
- When cleared to cross any runway or taxiway, first visually check to ensure there is no conflicting traffic. If there is any doubt that the runway is clear, reconfirm crossing clearance with ATC
- Note that if you see an aircraft in take-off position on a runway with take-off/landing lights ON, that aircraft has most likely received its take-off clearance and will be departing immediately.

SMS – SAFETY MANAGEMENT SYSTEM

"Don't Ignore It – Report it"

A Safety Management System (SMS) is a proactive business-like approach to managing safety risk and mitigating potential hazards within the organization to improve safety performance.

STL is leading the way to implement a Safety Management System that enables all of us, Airport Authority, airlines, tenants and other business partners to operate in a safer environment.

SMS Hazard Reporting Website: https://sms.flystl.com/

Airport Authority Only: SMS website link on LambertZone.

The SMS form is not intended for emergencies. For emergencies, contact the Airport Operations Center or the Airport Police Department immediately.

With your active participation, accidents may be prevented and the airport's overall safety will be improved.

Non-Compliance

Drivers that have been granted driving privileges on the AOA must follow the Airport's rules and regulations or risk having their driving privileges revoked. The Airport is required by the Federal Aviation Administration to enforce the rules and regulations and document their enforcement. For this reason, the Airport Police Department and the Airport Operations Center monitor the AOA and will stop any vehicles found to be violation of any established rule.

Failure to comply with AOA rules and regulations will subject you to the following graduated penalties:

1. Receipt of 1 violation in any 12-month period will automatically result in a recorded warning on the your badge's permanent record.
2. Receipt of 2 violations in any 12-month period will automatically require you to attend the Airport Operations Department's Non-Movement Area Ramp Driver Class within 30 days. Failure to attend re-training within 30 days will result in the suspension of your Airport ID.
3. Receipt of 3 violations in any 12-month period will automatically result in at least a 7 day suspension of driving privileges and mandatory recurrent training attendance with Airport Operations within 30 days of the 3rd violation.
4. Receipt of 4 violations in any 12-month period will automatically result in at least a 1 year or more permanent revocation or airside driving privileges as well as mandatory recurrent training attendance with Airport Operations prior to your driving privileges being restored.

Based on an evaluation of the circumstances or the severity of a particular incident or incidents, the Airport reserves the exclusive right to assess any penalty, including citations from Airport Police, it deems appropriate at any time to any individual authorized to operate a vehicle on the AOA without regard to prior operating history.

Emergency Procedures and Contact Numbers

If you are involved in any accident with your vehicle anywhere on the movement or non-movement areas, you are required to report the accident to the Airport Police and the Airport Authority Operations Center immediately.

The following list of phone numbers is to be used to report any emergency, suspicious activity, or abnormality. These numbers are manned 24 hours per day.

Airport Operations Center	426-8040, 41, 42
Airport Fire Department	**426-8133 (Emergency line)** 426-8136 (North House) 426-8005 (West House)
Airport Police/Security/EMS	426-8100

Notes: