

GROUND OPERATIONS MANUAL

2023

**Spirit Of St. Louis Airport (SUS)
Chesterfield, MO**



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GROUND VEHICLE OPERATIONS MANUAL

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SPIRIT OF ST. LOUIS AIRPORT

GROUND VEHICLE OPERATIONS MANUAL

INTRODUCTION

PURPOSE

Every year there are many accidents and incidents involving aircraft and ground equipment on airport grounds that can result in property damage, personal injury and sometimes, death. Most of these accidents and incidents could have been prevented.

In an effort to enhance safety of ground vehicle operations on Spirit of St. Louis Airport, we have developed an Air Operations Area (AOA) Driver's Training Program for all airport employees, tenant employees, FBO's and contractors with an official need to drive on the AOA.

GENERAL

Runway incursions are the end product of human error. This manual is intended to give its users basic background knowledge of operating motor vehicles – such as maintenance vehicles, emergency equipment, snow removal equipment, fuel trucks, and tugs – in a safe and standard manner.

The contents of the Ground Operations Manual contain information for both Movement and Non-Movement Areas, communication terminology and examples, as well as standard operating procedures.

Remember, this Ground Operations Manual is to be used as a guide.

PROCEDURES

A. In order to be eligible for a SUS Airport AOA driver's license, all applicants must possess a current valid state issued operators license to operate a motor vehicle, complete security training and successfully complete airfield drivers training.

B. No person shall operate any motor vehicle on the AOA without a Spirit of St. Louis Airport approved **Red** or **Blue Badge**.

Continued on next page

SPIRIT OF ST. LOUIS AIRPORT GROUND VEHICLE OPERATIONS MANUAL

PROCEDURES CONTINUED

D. After the applicants have successfully completed their Driving Training Program, they will present a copy of their Badge Application Form to Airport Administration, where the appropriate badge will be made for them. This badge must be worn at all times while on the AOA.

E. Contractors working for tenants on the non-movement area of the AOA will be trained and tested by the appropriate party and given a copy of the Rules for Airport Construction which is available at the Airport Administration office. The contractors will be issued temporary badges by Airport Administration for the duration of their job. If the contractor refuses formal training the tenant must arrange for the contractor to have escorts by someone who is authorized to drive on the AOA.

F. Contractors hired to work on the movement areas, whether hired by a tenant or Airport Administration, will always be trained and tested by Airport Administration and trained in accordance with Rules for Airport Construction.

SECTION I

DEFINITIONS

- 1. Accident**—a collision between an aircraft or vehicle and another aircraft, vehicle, person, or object that results in property damage, personal injury, or death.
- 3. Airside**—those areas of an airport that support aircraft activities.
- 4. Airport Traffic Control Tower (ATCT)**— Refers to the FAA owned and operated tower, located on Spirit of St. Louis Airport, used to direct the movement in the air within the vicinity of the airport and on the ground within the Movement Area and associated safety areas. Ground Control, Tower, SUS ATCT are terms used throughout this manual that have the same meaning.
- 5. Aircraft**—a device that is used or intended to be used for flight in the air.
- 6. Airport**—Spirit of St. Louis Airport Facility, owned and operated by St. Louis County including all improvements and equipment existing or to be developed.
- 7. Apron or Ramp**—a defined area on an airport or heliport intended to accommodate aircraft for the purposes of loading and unloading passengers or cargo, refueling, or maintenance also intended for aircraft parking
- 8. Common Traffic Advisory Frequency (CTAF)**—radio frequency designed for the purpose of carrying out airport advisory practices while operating to or from an airport without an operating ATCT or when the tower is closed. During the hours of 1100pm – 0600am at SUS the CTAF is 124.75.
- 9. 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 the sale and dispensing of fuel, line services, aircraft parking and tie-down, pilot and passenger facilities, airframe and power plant maintenance, aircraft sales and rental, and pilot instruction. At Spirit of St. Louis Airport, there are five FBO's: Executive Beechcraft, Signature, Million Air, Aero Charter and Midwest Aviation Center.
- 10. Flight Service Station (FSS)**—air traffic facilities that provide pilot briefings, en route communications, and visual flight rules, search and rescue services; assist lost aircraft and aircraft in emergency situations; relay air traffic control clearances; originate Notices to Airmen; broadcast aviation weather and National Airspace System information; receive and process instrument flight rules flight plans; and monitor NAVAIDS. In addition, at selected locations, FSSs provide En Route Flight Advisory Service (Flight Watch), take weather observations, issue airport advisories, and advise Customs and Immigration of transborder flights.
- 11. Foreign Object Debris (FOD)**—debris that can cause damage to aircraft engines, tires, or skin from rocks, trash, or the actual debris found on runways, taxiways, and aprons.

12. General Aviation (GA)—that portion of civil aviation that encompasses all facets of aviation except military and air carriers holding a certificate of public convenience and necessity.

13. Ground Vehicle—all conveyances, except aircraft, used on the ground to transport persons, cargo, fuel, or equipment.

14. 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.

15. Jet Blast—jet engine exhaust or propeller wash (thrust stream turbulence).

16. Law Enforcement Officer (LEO)—any person vested with police power of arrest under Federal, state, county, or city authority and identifiable by uniform, badge, and other indication of authority. Airport Police.

17. Light Gun—a hand-held, directional light-signaling device that emits a bright narrow beam of white, green, or red light, as selected by the tower controller. The color and type of light transmitted can be used to approve or disapprove anticipated pilot or vehicle actions where radio communication is not available. The light gun is used for controlling traffic operating in the vicinity of the airport and on the airport movement area.

18. Mobile Fueler—a vehicle owned and/or operated by authorized agents to pump and dispense Jet A and 100 LL fuel at (AIRPORT). This may include fuel tankers, in-to-plane fueling pumpers, and hydrant carts.

19. Movement Area—the runways, taxiways, and other areas of an airport that aircraft use for taxiing, takeoff, and landing, exclusive of loading ramps and parking areas, and that are under the control of an air traffic control tower. At Spirit of St. Louis Airport while there is an operating ATCT, *specific approval* for entry onto the movement area must be obtained from ATC.

20. Non-movement Areas—taxiways, aprons, and other areas not under the control of air traffic or at airports without an operating airport traffic control tower.

21. Operator—any person who is in actual physical control of an aircraft or a motor vehicle.

22. Owner—a person who holds the legal title of an aircraft or a motor vehicle.

23. Restricted Areas—areas of the airport posted to prohibit or limit entry or access by the general public. All areas other than public areas.

24. Runway—a defined rectangular area on a land airport prepared for the landing and takeoff run of aircraft along its length.

25. Runway in Use or Active Runway—any runway or runways currently being used for takeoff or landing. When multiple runways are used, they are all considered active runways.

26. Taxiways—those parts of the airside designated for the surface maneuvering of aircraft to and from the runways and aircraft parking areas.

27. Tie Down Area—an area used for securing aircraft to the ground.

28. Uncontrolled Airport—an airport without an operating airport traffic control tower or when airport traffic control tower is not operating.

29. UNICOM—a non-Federal communication facility that may provide airport information at certain airports. Locations and frequencies of UNICOMs are shown on aeronautical charts and publications.

31. Wake Turbulence—phenomenon resulting from the passage of an aircraft through the atmosphere. The term includes vortices, thrust stream turbulence, jet blast, jet wash, propeller wash, and rotor wash both on the ground and in the air.

32. AIM-Aeronautical Information Manual

33. Airport Operations Area (AOA)-The portion of Spirit of St. Louis Airport which encompasses the landing, take off, taxiing and parking areas for aircraft.

34. Air Traffic Control (ATC)-A service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic.

35. ALS-Approach Landing System

36. Approved Vehicle- Refers to a vehicle that has been approved by the Director of Aviation to operate within Non-Movement Areas.

37. Authorized Vehicle- Refers to a vehicle that has been approved by the Director of Aviation to operate within all Movement Areas.

38. ARFF-Air Rescue and Fire Fighting equipment.

39. Blind Spot-In regards to the airport environment, an area or portions of the airport not visible from the control tower. These areas include but are not limited to the entrance from Taxiway A-5 to Signature and parts of Taxiways Zulu and Bravo.

40. MFPD- Monarch Fire Protection District

41. Director of Aviation-Refers to the Director of the Department of Aviation for the St. Louis County and/or designated representative(s).

42. Escort -A person(s) responsible for controlling the movements of individual(s), vehicles and/or equipment within the AOA. The individual(s) that provide the escort must meet the requirements outlined within this document.

43. Federal Aviation Administration (FAA) -The government organization that governs the safe and efficient use of the nation’s airspace, by military as well as civilian aviation, and promotes civil aeronautics and commercial aviation.

44. ILS-Instrument Landing System

45. LOA-Letter Of Agreement

46. MALSR-Medium intensity Approach Lighting System with Runway alignment indicator lights. The access roads at the approach ends of runway 8R-26L are referred to as the MALSR Road.

47. Nighttime-The period of time from one (1) hour prior to local official sunset to one (1) hour after local official sunrise.

48. Safety Area-An area that is 250 feet from either side of the centerline (usually marked by the hold short lines) and 1000 feet from the threshold of the runway edge. These areas are intended to reduce the risk of damage to an aircraft inadvertently leaving the runway or taxiway.

49. Spirit of St. Louis Airport Administration-Within this manual, refers to the Office of the Director of Aviation and includes Spirit of St. Louis Airport Maintenance, hereafter referred to as “Spirit Maintenance.”

50. SUS-The common airport identifier for Spirit of St. Louis Airport. Also used in conjunction with ATCT (SUS ATCT).

51. Traffic Pattern-The traffic flow that is prescribed for aircraft landing at, taxiing on, or taking off from an airport. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach.

- a. *Upwind Leg* – A flight path parallel to the landing runway in the direction of landing.
- b. *Crosswind Leg* – A flight path at right angles to the landing runway off its upwind end.
- c. *Downwind Leg* – A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg.
- d. *Base Leg* – A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline.
- e. *Final Approach* – A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. An aircraft making a straight-in approach VFR is also considered to be on final approach.

FAA Runway Safety Program

The following information and terminology is in regards to runway incursions and is adopted from the FAA's Blueprint for Runway Safety. The FAA has defined the following to better understand the problem of runway incursions. This terminology includes the FAA definitions used to describe specific aspects of runway safety.

Runway Incursion (RI)

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.

Surface Incident (SI)

Any event where unauthorized or unapproved movement occurs within the movement area or an occurrence in the movement area associated with the operation of an aircraft that affects or could affect the safety of flight. SI's result from PD's, OE's, vehicle or pedestrian deviations (V/PD), or operational deviations. Driving or walking on an active taxiway without ATCT authorization is a surface incident.

Collision Hazard

Any condition, event, or circumstance that could induce an occurrence of a collision or surface accident or incident (e.g., a pilot takes an unplanned or evasive action to avoid an aircraft, vehicle, object, or person on the runway).

Loss of Separation

As defined in Order 7110.65, an occurrence or operation, which results in less than the prescribed separation between aircraft, vehicles, or objects.

Classifications of Runway Incursions (RI's)

Pilot Deviation (PD)

The actions of a pilot that result in the violation of Title 14 of the Code of Federal Regulations or a Federal Aviation Regulation.

Operational Error (OE)

The actions of an air traffic controller that causes a loss of separation as defined in Order 7210.56A.

Vehicle/Pedestrian Deviation (V/PD)

Any entry or movement on the runway movement area by a vehicle or pedestrian that has not been authorized by ATC (includes aircraft operated by non-pilots).

SECTION II

NON-MOVEMENT AREAS

By definition, the Non-Movement Areas shall mean the aircraft loading and parking areas not under control of the Spirit Control Tower. Anyone authorized to operate a motorized vehicle on the AOA may do so on the Non-Movement Areas without being in positive contact with the control tower. These areas include:

- a. All aircraft ramps
- b. All FBO ramps and cargo aprons

APRONS/RAMPS

The words mean the same thing. They are interchangeable. The aircraft aprons/ramps are where aircraft park (See exhibit A). The public ramps at Spirit of St. Louis Airport are Signature, Million Air, Aero Charter, Midwest Aviation Center, West Satellite, North Ramp, Edison Ramp, Avmats and Avmats East.

If your work requires you to drive on the ramps you must at all times be alert to aircraft movements. You must watch out for aircraft that are moving, backing, or preparing to back up and yield the right of way to them at all times. Don't ever forget that aircraft have the right of way at all times. An aircraft that is getting ready to move will almost always have its strobe and navigation lights on. This can be a good indicator to you that this aircraft may be moving shortly. Failure to yield to these aircraft could cause a surface incident.

SPEED LIMITS

It is a violation to exceed the speed limits set forth by the Director of Aviation on the AOA. The maximum speed limit of any vehicle within the **Non-Movement Areas** is **15 mph, and within 15 feet of aircraft the maximum speed must be reduced to maximum of 5 mph.** Authorized vehicles operating within the **Movement Areas** are restricted to a maximum speed of **35 mph.** Emergency vehicles responding to emergencies are exempt from this regulation.

REPORTING ACCIDENTS

If you are involved in an accident you **must** report it immediately to your supervisor and the Airport Police. If a collision occurs between you and an aircraft, it is critical that the aircraft not be flown until the damage can be inspected and repaired.

VEHICULAR SAFETY

Airports are different than any other place you have worked. The driving environment in the Air Operations Area is more demanding of your attention than any other situation you could encounter. The potential for injury is great, and safety must always be our first priority at Spirit of St. Louis Airport. One careless

mistake could result in death or injury to many. It is up to each of us to make sure we do everything we can to make the airport as safe as possible. We must be knowledgeable of our surroundings; be aware of the various activities that take place on the ramps; know the meaning of the different pavement markings and lighting, and recognize the hazards that can exist. Everyone must take personal responsibility in keeping the AOA safe and secure.

ESCORTING

Sometimes it will be necessary to escort a vehicle onto the AOA. When you are providing a positive vehicle escort, you should observe the following.

- A) Brief the driver on what is going to take place before you begin escorting them onto the AOA. When you pull through the gate instruct the follower to stay directly behind you and then stop and wait for the gate to fully close. You are responsible for ensuring no other vehicles tailgate and the gate closes securely. Instruct the person being escorted to stay close behind you and follow you to your destination.
- B) You may only escort up to two vehicles at one time. If you have additional vehicles to escort onto the AOA, you will need to either make additional trips or have more than one escort vehicle.
- C) Make sure you observe the speed limits set forth by the Director of Aviation at all times. Do not leave the person being escorted behind. You should maintain no more than a 20 foot distance between your vehicle and the one you are escorting. Remember, you are familiar with the AOA but the person you are escorting is not.
- D) At all times monitor the vehicle you are escorting especially in the close proximity of moving aircraft.
- E) When escorting a vehicle off of the AOA the escorted vehicle must merge in front of you so that you are the last vehicle through the gate. If you are staying on the AOA make sure the gate closes behind the escorted vehicle as they exit. **REMEMBER, YOU ARE RESPONSIBLE FOR THE PERSON AND VEHICLE YOU ESCORT ONTO THE AOA.**

ACTIVITIES

The activities that occur on the ramps are varied and well coordinated. Ninety percent of all activities on the ramp are centered around the aircraft. When an aircraft pulls onto the ramp many things may take place. Passengers may de-plane or board. Luggage may be loaded. The aircraft may be fueled or de-iced. All these activities in one way or another can be hazardous to personnel or the aircraft. Trucks approaching the aircraft can strike the aircraft making it unsafe for flight until it can be repaired. Fuel vapors from fueling operations can ignite caused by people smoking or from improperly maintained equipment. There is **NO SMOKING** on the AOA.

At all times personnel must be extremely cautious when driving around and in close proximity to aircraft. This one safety precaution cannot be overemphasized. Aircraft on

the ramp can move at anytime. Look for the red or white anti-collision lights flashing at the top or bottom of an aircraft. This is a good indication that the aircraft is preparing to leave the area.

FOD

Foreign Object Debris is waste and loose material, which is capable of causing damage to aircraft landing gear, propellers, jet engines, and can be found on runways, taxiways, and ramps. This debris can get sucked up into a jet engine and destroy it in matter of seconds. Debris can also puncture tires, jam into moveable parts, or dent or puncture the aircraft skin, which would make an aircraft unsafe for flight. A rock picked up by a propeller can damage the propeller as well as become a deadly projectile that can severely injure anyone standing nearby.

You can make the aprons and airport a safer place by using these basic rules:

- a) Put all of your trash in a covered container that won't be knocked over.
- b) Pick up all trash or rock lying around on the ground if you happen to see any.
- c) Keep an eye out for small metal pieces like nails or bolts that can puncture tires
- d) Always avoid tracking mud or rocks onto the paved surfaces.

EQUIPMENT

All motorized equipment and non-motorized equipment on the AOA must be marked and in general, lighted. It is the responsibility of the operator of any piece of equipment to ensure that the equipment is marked and lighted. If a piece of equipment is not in compliance and is stopped by the airport police or Airport Administrators the operator will be ordered to park the vehicle or remove it from the AOA until it is brought into compliance. This also applies to contractor vehicles.

SIGNS/MARKINGS

General

The following airport markings and signs are considered to be standard. These signs and markings are utilized in the interest of safety, regularity, and efficiency of aircraft and ground operations. These will be signs and markings you will find in the Non-Movement areas.

The **Non-Movement Area Boundary Marking** consists of two yellow lines (one solid and one dashed). The **solid line is located on the NON-MOVEMENT AREA side** while the **dashed yellow line is located on the MOVEMENT AREA side**. (See figures 1 and 2).



Figure 1. Non-Movement Area Boundary Marking



Figure 2. Position of vehicle on the Non-Movement Area side of the boundary.

This sign will also usually accompany the Non-Movement boundary marker. Only personnel that have been trained and authorized to operate on the Movement Area may proceed.

Figure 3. Aircraft Movement Area Sign



SECTION III

SPECIAL OPERATIONS

Special operations on the AOA involve set procedures, personnel and equipment that may be encountered from time to time.

AIRCRAFT EMERGENCIES

1. AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF)

This is unit of the Monarch Fire Department comprised of fire fighters specially trained in aircraft rescue and fire fighting. Anytime there is a declared aircraft emergency at Spirit of St. Louis Airport, whether on the ground or in the air, ARFF will respond. In addition to responding to aircraft emergencies, they are also trained to handle other types of emergencies, such as fuel spills, hazardous material incidents, medical emergencies and equipment fires.

The airports ARFF equipment is painted a lime-green color and labeled with a unit number and Spirit of St. Louis Airport. The Monarch Fire Protection District equipment is red. ARFF equipment responding to an emergency has the right of way over all other types of equipment except moving aircraft. If you observe an ARFF vehicle with its lights flashing and moving at a high rate of speed yield the right of way and stop until the emergency equipment has passed.

SNOW REMOVAL

During the winter months the airport may become involved in snow removal and/or ice control. It is the airports responsibility to keep the runways, taxiways, and some ramps usable to all aircraft during all weather conditions.

Snow removal is a highly complicated task that involves the efforts of many people and equipment. Other airport personnel can assist in these efforts by observing the following.

- a) Yield the right of way to snow removal equipment. This equipment is large and difficult to maneuver.
- b) When snow begins to fall, collect all wheel chocks from the ramp and place them in an accessible area to you, but out of the way of snow removal equipment.
- c) Keep all equipment up close to the FBO of governing agency.

AIRFIELD MAINTENANCE

The airport is responsible for maintaining the airfield pavement and lighting systems as well as the grounds. The field maintenance section has personnel detailed to maintain these facilities. You may see them patching holes, fixing lighting, or mowing grassy areas. Be vigilant when these operations are in progress.

SECTION IV

MOVEMENT AREAS

By definition, the Aircraft Movement Areas are those areas that encompass the **runways** and **taxiways** and associated safety areas. These areas are under positive control of the control tower and positive RADIO contact must be made with the tower and clearance given prior to entering and departing. (See **Exhibit B**)

NOTE- There is one exception to this rule.

1. Between the hours of 2300L and 0600L when Spirit of St. Louis Airport becomes an uncontrolled airfield, clearance is *not* required for vehicles to operate within the AOA on all taxiways. However, authorized vehicles need to *announce their intentions on CTAF 124.75/St. Louis Radio* and if operating on a runway they will also need to contact St. Louis Approach on 121.7. They must advise both St. Louis Approach and St. Louis Radio when the vehicle is *clear* of the runway.

TAXIWAYS

1. DESIGNATIONS

Taxiways are used by aircraft travel to and from the ramps and the runways. Taxiways look like runways but the lighting, signing, width, and pavement markings are different. Taxiways are designated by **letters** or by a **letter/number** combination such as **A, B, or A1**.

2. LIGHTING

Taxiways are always lighted with **blue** edge lighting. The taxiways at Spirit of St. Louis Airport do not have centerline lighting, only **blue** edge lighting.

3. SIGNS

The signs for taxiways are directional, location, and taxiway ending marker signs. The directional signs have **black lettering** with a **black directional arrow** on a **yellow background**. The location signs have **yellow** lettering on a **black background**. Taxiway ending marker signs have **yellow** diagonal lines on a **black background**. (See **exhibit D and E for examples and purpose of these and other airfield signs** and See **Exhibit G**). (See exhibit D and E for examples and purpose of these and other airfield signs.) See **figures 4 and 5**.

SIGNS ON TAXIWAYS AT SPIRIT



(Figure 4) Taxiway Location and Directional Signs at Spirit of St. Louis Airport



(Figure 5) Taxiway Ending Marking Sign

4. MARKINGS

Taxiways may be as long as runways but they are much narrower. Generally the taxiways at Spirit of St. Louis Airport are 35-50 feet wide. **All taxiways have yellow pavement markings.** The taxiway centerline, or nose gear line, is painted on all taxiways. On the edges of some taxiways there will be a double yellow line to distinguish between load bearing surfaces and non-load bearing surfaces. Across each taxiway that leads directly onto a runway are a solid double line and a broken double line. **These are called runway holding position markings. DO NOT CROSS THESE MARKINGS WITHOUT FIRST CONTACTING THE CONTROL TOWER AND GETTING CLEARANCE ONTO THE RUNWAY. (SEE FIGURE 6,7, 8 and 9 below)**



(Figure 6) Hold Short Lines and Taxiway Centerline



(Figure 7) Hold Short Lines



(Figure 8) Hold Short Lines



(Figure 9) Taxiway Edge Lines

All Taxiway intersections have the enhanced taxiway centerlines (See figure below). These Enhanced Taxiway Centerlines begin 150ft. Prior to a holding position and their purpose is to alert the vehicle driver or pilot that a mandatory holding position is up ahead.



Figure 8a : Enhanced Taxiway Centerline



Figure 8b : Enhanced Taxiway Centerline

All Holding Positions also have the Surface Painted Hold Position Sign (See Figures Below). These markings are replicas of the Lighted Hold Position Signs seen in figure 14. These surface painted markings are in place to enhance the visibility of the Holding Position Sign to the left of the intersection and increase safety. They mean the same thing the lighted signs mean which is you must call for clearance prior to passing this point.



Figure 8c : Surface Painted Hold Position Sign



Figure 8d : Surface Painted Hold Position Sign

PRECISION OBSTACLE FREE ZONE (POFZ)

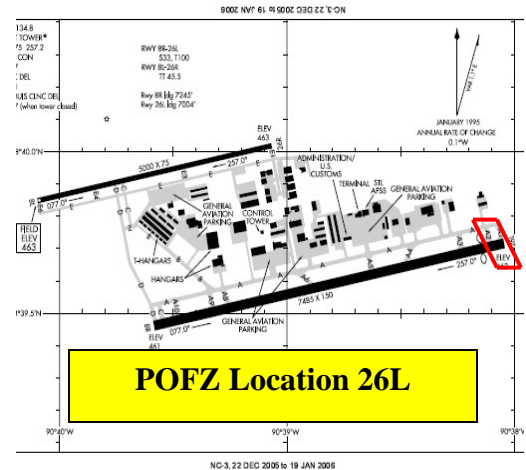
The POFZ is defined as a volume of airspace above an area beginning at the runway threshold, at the threshold elevation, and centered on the extended runway centerline, 200 feet long by 800 feet wide. Maintaining the POFZ clear during low ceiling/low visibility conditions protects both the landing aircraft and holding aircraft or vehicle.



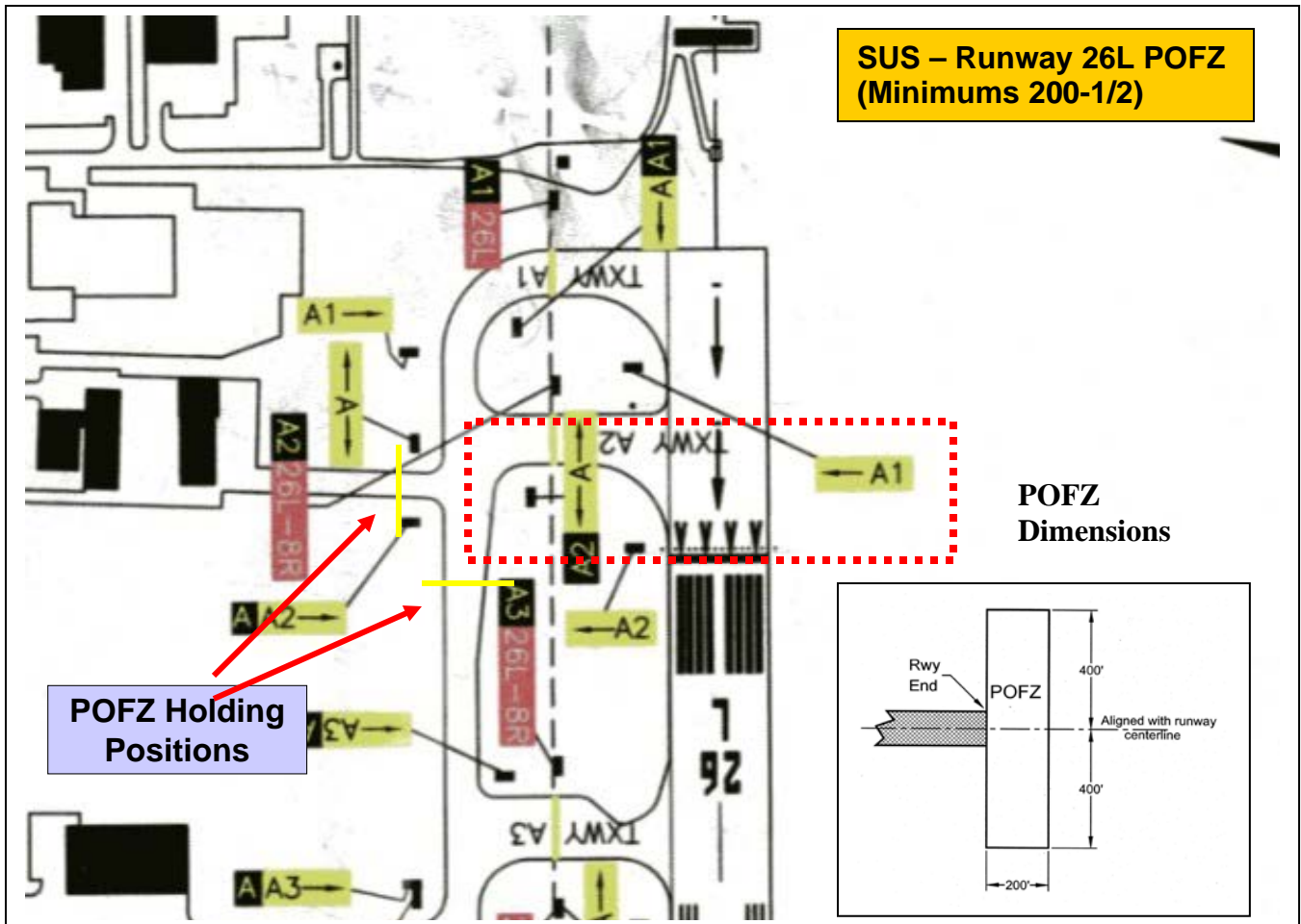
POFZ Hold Position Sign



POFZ Hold Position Marking



The POFZ is in effect for vertically guided approaches when the ceiling is below 800 feet and/or visibility less than 2 statute miles, and an aircraft is on final approach within two miles of the runway threshold.



POFZ Procedures

When the weather conditions warrant the activation of the POFZ clearance to enter this area must be received on 124.75 or 121.7 before you may enter with a vehicle or aircraft. The POFZ Hold Position Lines will be treated just like Runway Hold Position Markings; you cannot cross these markings unless you have received clearance from the SUS ATCT.

RUNWAYS

1. DESIGNATION

Runways are areas where aircraft land and take-off. Runways look like taxiways except the lighting, signing, width, pavement, and pavement markings are very different. Runways are always designated by a number. SUS has a set of parallel runways which include a letter designation also for either left or right. Runways at SUS are labeled 8R/26L, which is the big runway, and 8L/26R, which is the smaller runway. The number indicates the compass heading of the runway. An aircraft taking off from 26L is on the big runway heading 260 degrees or almost due west. (See Fig. 10 below)



(Figure 10) Runway Designator Numbers and Letters

2. LIGHTING

Runways are always lighted with a variety of colored lights.

- a) Runway edge lights are white until the last 2000 ft. of the runway when they become amber in color
- b) Centerline lights are white except for the last 3,000 ft. where they begin to alternate red and white. For the last 1000 ft. of runway the centerline lights are red.
- c) Runway end/threshold lights are at the ends of the runways. A split two-color lens (red/green) is used. The green half of the lens faces the aircraft in the air on landing, indicating the beginning of the usable runway. The red half of the lens faces the aircraft on the ground as it is taking off, indicating the end of the usable runway.

(See Fig. 11,12, and 13)



(Figure 11) Alternating Red and White Centerline lights



(Figure 12) Green Threshold Lights



(Figure 13) Runway Centerline Lights-White

3. SIGNS

Holding Position Signs for Runways are white **numbering/lettering** on a **red background**. These are located at each entrance to a runway and are located at the edge of the runway safety area. These signs indicate to pilots and ground personnel where to stop to get permission from the control tower to proceed onto the runway. These are used in conjunction with the hold short lines. **Do not proceed beyond these signs until clearance is given by the tower to enter onto the runway.** (See Fig. 14)



(Figure 14) Hold Short Sign

Runway Safety Area boundaries At Spirit of St. Louis Airport are marked by the Hold Short lines and Signs. By definition, the safety area is an area that is 250 feet from either side of the centerline and 1000 feet from the threshold of the runway. These areas are intended to reduce the risk of damage to an aircraft inadvertently leaving the runway or taxiway. The safety area is considered part of the paved runway surface and is therefore subject to the same permission and clearance requirement from SUS ATCT as a runway. The MALSR access roads located at the approach ends of Runway 8R-26L is a good example for when clearance is needed, since both access roads are in the safety area. Just as you would hold short of Runway 8R at Taxiway Delta, for instance, you would do the same thing to access the MALSR access road at the approach end of 8R (SEE Fig 15 & 16 and exhibit C)

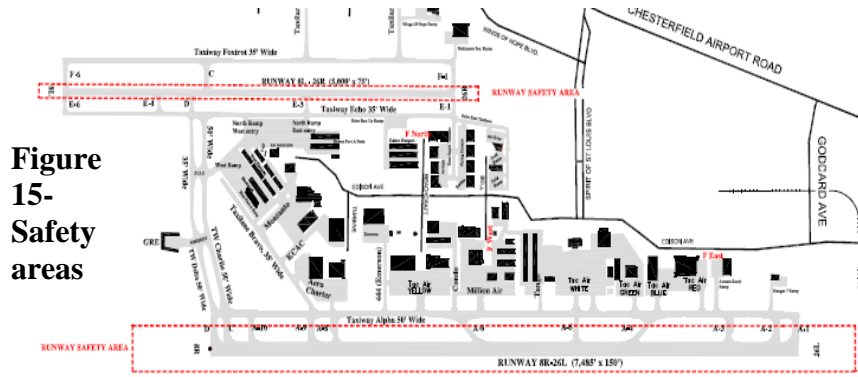
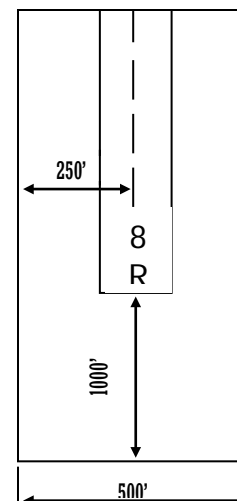


Figure 15- Safety areas



(Figure 16) Safety Area Dimensions

Runway Distance Remaining Signs: These signs are used to provide distance remaining information to pilots during take-off and landing operations. It has a white numbering on a black background. The number on the sign provides the remaining runway length in 1000 feet increments. (see fig 17)



(Figure 17) Runway Distance Remaining Sign

4. MARKINGS

PAVEMENT MARKINGS ON ANY RUNWAY ARE ALWAYS WHITE. On a runway there are white edge lines, threshold bars, touchdown zone bars, fixed distance marks, designation number and/or letter, and a centerline. The only non-white markings on the runway are the taxiway lead-in lines, which have a yellow centerline that extend out to the centerline of the runway. (See fig 18,19, and 20)



(Figure 18) Runway Centerline Markings



(Figure 19) Runway Edge line



(Figure 20) Taxiway Lead in lines
Centerline Extending to the Runway
Centerline

SAFETY

1. RUNWAY INCURSIONS

The official definition of a runway incursion is “**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 incursions are primarily caused by error in one or more of the following areas:

- **Breakdown in Communications**
 - Pilot Communications
 - Ground Vehicle Communications
 - Air Traffic Controller Communications
- **Lack of Airport Familiarity**
- **Loss of Situational Awareness**

A **SURFACE INCIDENT** means any event where unauthorized or unapproved movement occurs within the movement area or an occurrence in the movement area associated with the operation of an aircraft that affects or could affect the safety of flight.

When driving on the airfield always be aware of where you are at all times. When on the aprons and taxiways stay away and steer clear of aircraft. **Aircraft always have the right of way.**

2. COMMUNICATION

Any vehicle driving on the movement areas (runways and taxiways) must be in contact with the control tower. Always monitor your ground control radio, 121.70, when you are on the movement areas. Permission must be requested and clearance given prior to driving on the runway at Spirit of St. Louis Airport. A vehicle without a two-way radio may be escorted by a vehicle that is equipped with the proper radio.

3. TOWING OF AIRCRAFT

When towing and aircraft and/or taxiing an aircraft, by non-pilots on a movement area, the following must be observed.

- a) You must be approved by your company and Spirit of St. Louis Airport to perform this type of operation.
- b) Your vehicle/tug must be equipped with a VHF two-way radio that has the capability to be tuned to all frequencies established by the FAA for aircraft control at Spirit.
- c) Your vehicle/tug must be lighted with an operational amber flashing or rotating beacon mounted on the uppermost part of the vehicle.

- d) If you are taxiing the aircraft you must be in direct radio communication with ground control as well as in direct communication with any other support vehicles or equipment following the aircraft.
- e) If the aircraft is under tow and you are in the cockpit communicating via radio with ground control, you must also have means to communicate directly with the tug operator via radio.

4. RUNWAY SAFETY AREAS

Runway Safety areas extend 250 ft. to each side of the runway centerline and 1000 ft. from the runway threshold. All vehicles, equipment, and personnel must get clearance from the control tower to access this area and must remain in direct contact with the tower while in these areas. **See SIGNS part 3 , Fig 15 ,16 and exhibit C.**

5. NAVIGATIONAL AIDS

When driving near navigational aids, remain clear of the protected areas around them to avoid interfering with their signal.

SECTION V

COMMUNICATIONS

VHF COMMUNICATIONS

All vehicles, operating on the movement areas will be equipped with a VHF two-way radio. This radio will have the capability to be tuned to all frequencies established by the FAA for aircraft control at the Airport. Frequencies used at SUS Airport are:

Radio Frequencies

121.7	Spirit Ground
124.75	Spirit Tower
124.75	STL Radio/CTAF Between 2300L and 0600L
121.7	STL Approach between 2300L and 0600L
134.8	ATIS

NOTE- There is one exception to this rule.

1. Between the hours of 2300L and 0600L when Spirit of St. Louis Airport becomes an uncontrolled airfield, clearance is *not* required for vehicles to operate within the AOA on all taxiways, however all vehicles must announce their intentions on 124.75 (CTAF). Authorized vehicles need to *advise* both St. Louis Radio on 124.75 (CTAF) as well as St. Louis Approach on 121.7 when *intending* to drive on any runway and will advise both St. Louis Approach and St. Louis Radio when the vehicle is *clear* of the runway.

The ground control frequency is used by the FAA ground controller in the control tower to control all ground traffic, vehicle and aircraft, on the movement areas. This frequency will only be used to get clearance onto and off the movement areas and any other instructions incidental to safe movements on the runways and taxiways.

PHRASEOLOGY AND RADIO TECHNIQUE

It is required that the FAA ground controller be contacted prior to proceeding on or proceeding off of the movement area. (**See exceptions above**). When proceeding onto a Movement Area, you must tell the controller three things: WHO you are, WHERE you

are, and WHAT your intentions are. Always acknowledge all communications so that ground control and other persons know that you have received the message. Always give aircraft and ground control priority over your transmissions unless and emergency exists.

Listen before you transmit. If you hear someone else talking, the keying of your transmitter will be futile and you will probably jam their receivers causing them to repeat their call. *Think* before keying your transmitter. Know what you want to say. The microphone should be very close to your lips and after pressing the mike button, a slight pause may be necessary to be sure the first word is transmitted. Speak in a normal conversational tone.

People who have no aviation experience most likely will find that aviation communication is fast and may feel overwhelmed at first. This is normal. Talking within the ATC environment will eventually become easier, but it is recommended that when operating an authorized vehicle within Movement Areas, you should take someone more experienced with the radio. This will aide in your transition, as you can observe his or her technique, ask questions, and learn proper procedures and techniques.

Contact Procedures: Communications Procedures (0600L – 2300L)

The initial contact is your first call - depending on the situation - to SUS ATCT, St. Louis Radio, or St. Louis Approach. On your initial contact you should provide the following information:

	<u>Normal hours of operation (0600L – 2300L)</u>
Who you're talking to:	<i>"Spirit Ground"</i>
Who you are:	<i>"Thunder Tug"</i>
Where you are:	<i>"At Thunder West"</i>
What you want to do:	<i>"Request to tow aircraft from Thunder Terminal to Thunder East"</i>

Use discretion; do not overload the controller with unneeded information. On subsequent contact and responses you should use the same format as used on your initial contact. However, in order not to keep the frequency tied up any longer than is necessary, you should state your message or request with the call up in one transmission. Also, if the message requires an obvious reply and there is no possibility for misunderstandings, you may omit the ground station name. Using the preceding example, when Spirit Ground acknowledges the request and clears the tug to operate from Thunder West to Thunder East, his/her response could be as follows:

	<u>Response from Thunder Tug to Spirit Ground:</u>
Who you are:	<i>"Thunder Tug"</i>
What you are doing:	<i>"Proceeding from Thunder West to Thunder East"</i>

Communications Procedures After Hours (2300L – 0600L)

Communications at Spirit of St. Louis Airport from the hours of Midnight until 6 a.m. are much the same as they are when the tower is operational, with only a few variations. Instead of talking to Spirit Tower to operate a vehicle on the runway, you talk with St. Louis Radio. St. Louis Radio is the same thing as Flight Service (FSS); someone from FSS monitors 124.75 when the tower is closed.

If you want to drive on Runway 26L for instance, you would announce your intentions over 124.75 – the Common Traffic Advisory Frequency (CTAF).

Example (You): “St. Louis Radio, Spirit Maintenance Vehicle will be driving runway 26L.”

Usually what will happen after that, a specialist from Flight Service (FSS) who is monitoring 124.75 will verify what you just announced, or may even ask you to say again. At this point you are talking to the specialist, referred to as St. Louis Radio (not St. Louis Tower or Spirit Tower). Your reply would be as follows:

“St. Louis Radio, Spirit Maintenance. Will be driving 26 Left from Alpha One (or other intersection) for inspections/maintenance. Will advise when clear.”

Before driving on any runways, even when you’ve already announced your intentions, look for any traffic. Remember your traffic patterns, and be especially vigilant for traffic turning base or final for your runway you are about to drive on.

As you can see, it is much like talking to Spirit Tower. The only thing that really changes is whom you talk to. Remember, you need to announce your intentions over 124.75 so that any airplane in the area will hear you and know what you are doing, and where you are. **This does not relieve you of your responsibility for safety: ALWAYS look out for traffic in the vicinity of the airport, especially during all hours Spirit Tower is closed!!** The second part is basically to let Flight Service know what is going on so that they may adequately give traffic advisories at Spirit. Think of it as a common courtesy.

Remember, you still have the four main elements of communication in your transmissions:

	<u>Normal hours of operation</u>	<u>0000L – 2300L</u>
Who you’re talking to:	“Spirit Tower”	“St. Louis Radio”
Who you are:	“Spirit One-Four”	“Spirit Maintenance”
Where you are:	“At Alpha One”	“At Alpha One”
What you want to do:	“Request to drive 26 Left. Inspections”	“Will be driving 26 L for inspections”

St. Louis Approach

There are certain times that may require you to talk to St. Louis Approach. This is only done when Spirit Tower is closed, and is done on 121.7 – the ground frequency. Very

rarely, you will need to talk to Approach. Sometimes St. Louis Radio will ask you, before driving on any runway, if you have contacted St. Louis Approach. This is usually done to let St. Louis Approach know that there will be a vehicle on the runway at Spirit, and as for your benefit it is to let you know if there are any traffic inbound for the airport. In another instance, you might need to do a simple procedure like changing a runway centerline light on 26 L. In this instance, as well as other complex ones, the main reason for talking with St. Louis Approach is to know if there are any inbound aircraft; they can usually give you an answer as well as a time estimate because of their use of radar. This is useful in determining if you have enough time to change that light bulb for the centerline lights. Before calling Approach, listen to the frequency to see if it is clear to talk – don't "step" on anyone. This is why your initial call-up is short and to the point.

Example: You: *"St. Louis Approach, Spirit Maintenance."*
App: "Spirit Maintenance, St. Louis Approach, go ahead."
You: *"Yes sir (or ma'am). If you're able, can you please tell me if there are any inbound aircraft for Spirit?"*
At this point, they will look at their radar scopes and see if there any traffic inbound for Spirit.
App: "Spirit Maintenance, St. Louis Approach. There is a Hawker 1-0 miles to the South. Will be landing at Spirit shortly." (which usually means a few minutes)
You would then get back on the radio and say the following:
You: "Roger. I'll remain clear of the runway. Any other traffic after him?"
App: "Negative."
You: "Roger. Thanks for your help."

This is just an example, but from experience this is a typical conversation you would have with Approach. Talking with Approach is just like talking to Tower; they're people up there just like you and me.

After the traffic has landed and taxied off of the runway, you would then proceed to make you call on 124.75 as described earlier. While on the runway for any reason, whether it is for inspections or for maintenance (replacing centerline lights, for example), **ALWAYS** listen to 124.75 and keep a hand held tuned to 121.70 in order to monitor both frequencies.. Don't trust FSS to advise you of any traffic (they don't have radar), and especially don't trust pilots flying into the airport: some pilots never talk on the frequency and are not required to do so.

NOTE 1- If you are ever unsure what the controller said, or if you don't understand an instruction, ask the controller to repeat it. Good communication only occurs when each party knows and understands what the other is saying.

NOTE 2: At the Taxiway A-5/Non-Movement Area Boundary and at North entrance to the West Shade ports, SUS ATCT cannot make nor maintain visual contact with any vehicle or aircraft. This is due to a blind spot created by the Spirit of St. Louis Administration building at Taxiway A-5 and the blue Port-A-Ports along Taxiway Bravo.

COMMON USE PHRASES

****Remember to keep safety your number one priority while operating on an airport. Always use common sense.**

What is Said:

Acknowledge

Advise Intentions

Affirmative

Confirm

Correction

Go Ahead

Hold

Hold Short

How do you hear me?

Immediately or
Without delay

Negative

Out

Over

Proceed

Read Back

Roger

Say Again

Speak slower

Stand by

That is correct

Unable

Verify

Wilco

What is Means:

Let me know you have received and understand this message.

Let me know what you plan to do.

Yes

Verify my last transmission.

I made a mistake-this is what I should have said.

Continue speaking your message.

Stay where you are.

Stop at the hold short lines at the intersection of the taxiway and the runway. Do not cross the runway hold line and proceed onto the runway.

How well is the radio working?

RIGHT NOW!

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

The radio conversation has ended and no response is expected.

My radio transmission has ended and I expect a response.

You are authorized to begin or continue moving.

Repeat my message to me.

I have received all of your last transmission.

Repeat what you just said.

Speak slower.

Wait a moment, I will call you back.

The understanding you have is correct

I am unable to do it.

Request confirmation of information. Also, check and transmit correct information.

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

PHONETIC AVIATION ALPHABET






Because some letters have similar sounds, like B and P, the aviation industry uses the following words to reduce confusion. For example, Taxiway A would be referred to as Taxiway Alpha on the radio.

A	Alfa	AL-FAH
B	Bravo	BRAH-VOW
C	Charlie	CHAR-LEE or SHAR-LEE
D	Delta	DELL-TAH
E	Echo	ECK-OH
F	Foxtrot	FOKS-TROT
G	Golf	GOLF
H	Hotel	HOH-TEL
I	India	IN-DEE-AH
J	Juliet	JEW-LEE-ETT
K	Kilo	KEY-LOW
L	Lima	LEE-MAH
M	Mike	MIKE
N	November	NO-VEM-BER
O	Oscar	OSS-CAR
P	Papa	PAH-PAH
Q	Quebec	KEH-BECK
R	Romeo	ROW-ME-OH
S	Sierra	SEE-AIR-RAH
T	Tango	TANG-GO
U	Uniform	YOU-NEE-FORM
V	Victor	VIK-TER
W	Whiskey	WISS-KEY
X	Xray	ECKS-RAY
Y	Yankee	YANG-KEY
Z	Zulu	ZOO-LOO
1	One	WUN
2	Two	TOO
3	Three	TREE
4	Four	FOW-er
5	Five	FIFE
6	Six	SIX
7	Seven	SEV-en
8	Eight	AIT
9	Nine	NIN-er
0	Zero	ZEE-RO

CONTROL TOWER LIGHT GUN SIGNALS

The following procedures have been established and are used by ATCTs in the control of ground vehicles when radio contact has been lost, or when a ground vehicle, equipment, or personnel has “lost his/her radio.” If you have lost communications or think that you have, first make sure your radio is at an audible level, and that you are on the proper frequency. If you are ever on a runway or taxiway and your radio quits working, you should use a cell phone to contact the tower 314-890-7290 or if you have no telephone turn your vehicle toward the tower and start flashing your headlights and the controller will signal you with the light gun. If at anytime you see light gun signals directed to you from the tower, the tower is communicating with *you* and you *do have* a radio failure. When the tower directs light gun signals at you, you are to obey them. Most likely, the tower will direct you to return to a point of origin, i.e. a Non-Movement Area.

These signals, and what they mean are as follows:

Air Traffic Control Tower Light Gun Signals	
MEANING	
COLOR AND TYPE OF SIGNAL	MOVEMENT OF VEHICLES EQUIPMENT AND PERSONNEL
Steady Green 	Cleared to cross, proceed or go
Steady Red 	STOP
Flashing Red 	Clear taxiway/runway
Flashing White 	Return to starting point on airport
Alternating Red and Green 	Exercise extreme caution

A recommended option if loss of radio communication with ATCT occurs is to leave the Movement area as quickly and safely as possible and contact ATCT by another Radio or by phone, advising the air traffic controller of the situation.

SECTION VI

REGULATIONS AND PENALTIES

With safety and security being the two most important things at Spirit of St. Louis Airport, Airport Administration has established the following regulations and associated penalties for ground vehicle operations on the Air Operations Area.

REGULATIONS

These regulations have been established for the safety of all persons operating vehicles and aircraft on the AOA. To ensure the safety of aircraft and the people aboard them, these regulations control the operations of all ground vehicles. All vehicles, whether they are engaged in airfield service, aircraft support or a contractor, are subject to these regulations. Penalties have been established for all violations.

1. AOA Authorization Badge

No person shall operate any motor vehicle on the AOA without first completing the Driver training course, Security Training and obtaining a BLUE or RED Spirit of St. Louis Airport approved badge or is escorted by someone with these qualifications.

2. SPEED LIMITS

It is a violation to exceed the speed limits set forth by the Director of Aviation on the AOA. The maximum speed of any vehicle within any Non-Movement Areas is 15 mph, and within 15 feet of aircraft the maximum speed is reduced to a maximum of 5 mph. Authorized vehicles operating within Movement Areas are restricted to a maximum speed of 35 mph. Emergency equipment responding to emergencies are exempt from this regulation.

3. YIELD RIGHT-OF-WAY

It is a violation for failure to yield the right-of-way. At all times, aircraft have the right-of-way. All vehicles must yield to and keep clear of moving aircraft and aircraft preparing to depart their parking area to include aircraft under tow.

Another unique situation to consider is in regards to emergency vehicles. The Monarch Fire Protection District (MFPD) will respond anytime there is a declared aircraft emergency, whether on the ground or in the air. In addition to the MFPD, the airport ARFF truck may respond as well. All ARFF equipment has the right-of-way over all other types of equipment. Because ARFF equipment has the ability to move at high rates of speed, all vehicles must be prepared to immediately yield the right-of-way to ARFF equipment and stop until ARFF equipment has passed.

The MFPD - when responding to an emergency - will proceed to the appropriate staging area depending on which runway the emergency has occurred or will occur on. For

emergencies on Runway 8R-26L, the South Staging Area is on the Signature White Ramp, near the Spirit of St. Louis Airport Administration building. For Runway 8L-26R, the North Staging Area is at the North Satellite Ramp. Airport Police should respond to the appropriate staging to assist with the gate and provide scene security and may be assisted by the Chesterfield Police Department.

4. SURFACE INCIDENT

A surface incident is any event where unauthorized or unapproved movement occurs within the movement area or an occurrence in the movement area associated with the operation of an aircraft that affects or could affect the safety of flight. A surface incident would occur if a vehicle drove onto a taxiway or runway without authorization or clearance. Driving or walking on an active taxiway without ATCT authorization is a surface incident.

5. 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.

6. MOVEMENT AREA REQUIREMENTS

No vehicle shall proceed onto a taxiway or runway unless it has written approval, is in positive radio contact with SUS ATCT, has received clearance, and has an official need to be on the taxiway and/or runway. It is a violation to indiscriminately or mistakenly use the taxiways and runways for short cuts. It is a *federal offense* to maneuver on the movement area without permission and clearance from SUS ATCT. **Additionally, any individual involved in a runway or taxiway incursion will be required to receive remedial training given by the office of the Director of Aviation.**

7. VEHICLE MARKING AND LIGHTING

All vehicles operating within the AOA will be properly marked and lighted. Otherwise, that vehicle and operator is in violation of this regulation and will be denied access onto the AOA.

Marking- All vehicles operating on the AOA that are not Airport Administration vehicles must display company identification.

Lighting- Vehicles operating on the **Non-Movement Area** are required to have an operational amber flashing or rotating beacon on the uppermost part of the vehicle. When it is not possible or reasonable to equip a vehicle with such a light, the vehicle shall be equipped with operational headlights, tail-lights, and reflective material on both sides.

Vehicles operating on the **Movement Area** are required to have an operational amber flashing or rotating beacon mounted on the uppermost part of the vehicle and should have 360 degree coverage.

PENALTIES

At the discretion of the Director of Aviation, violations of these Regulations, depending upon the nature and severity, may result in:

1. A verbal and/or written warning.
2. The removal from the AOA of the individual(s), vehicle(s) and/or equipment that is/are in violation. Driving privileges will be **suspended**. The AOA violator will also have to undergo remedial training.
3. The issuance of an AOA violation citation. In addition to this, the violator's driving privileges on the AOA will be **revoked** for a length of time to be determined by the Director of Aviation. A copy of the AOA violation will be kept on file at the Spirit of St. Louis Airport Administration office.

Note: **Depending on the nature of the offense, any individual involved in a runway or taxiway incursion may be required to submit a report to the FAA, and could possibly face criminal charges.**

Non-Movement Areas at Spirit

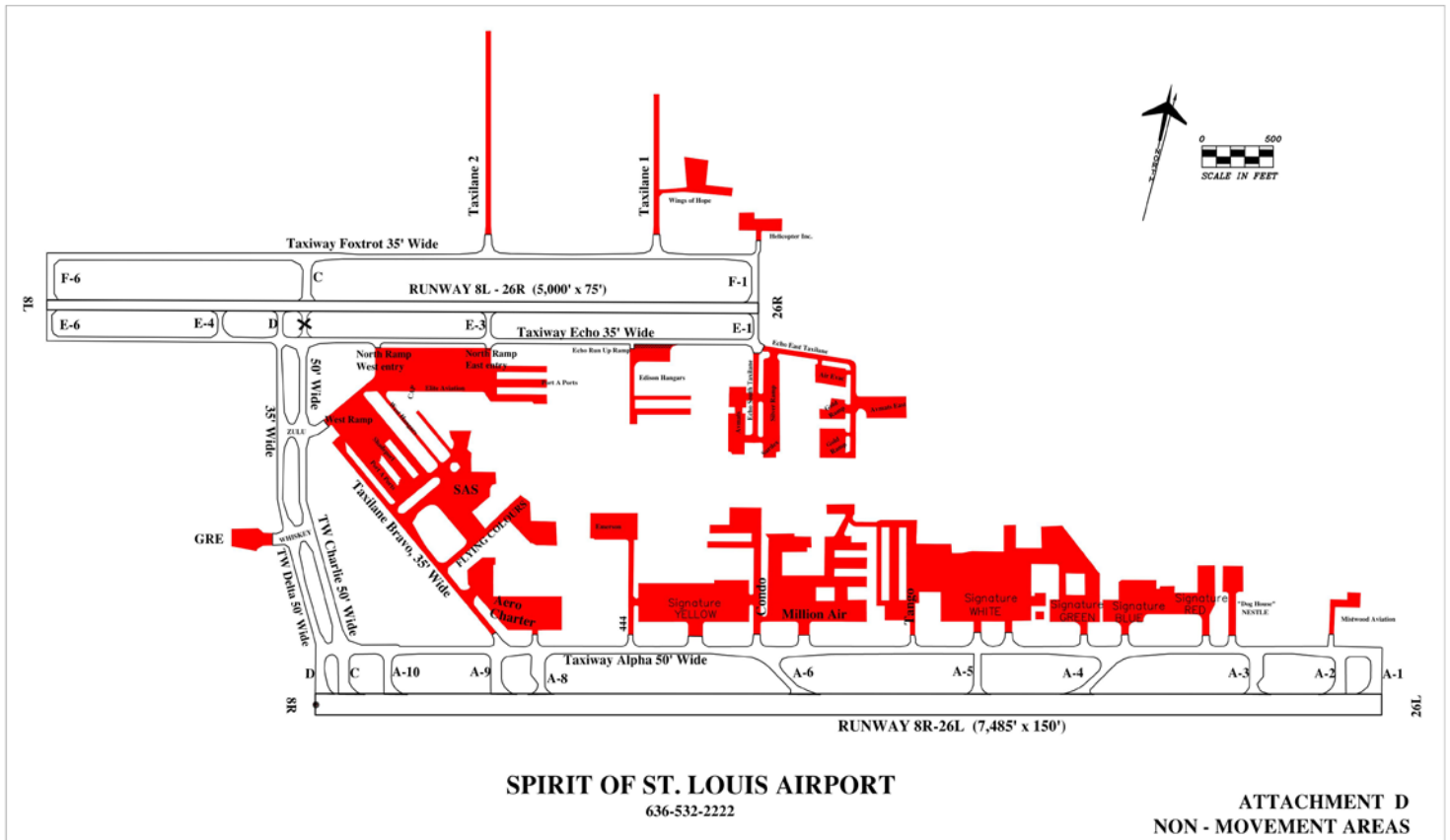


EXHIBIT A

Movement Areas at Spirit

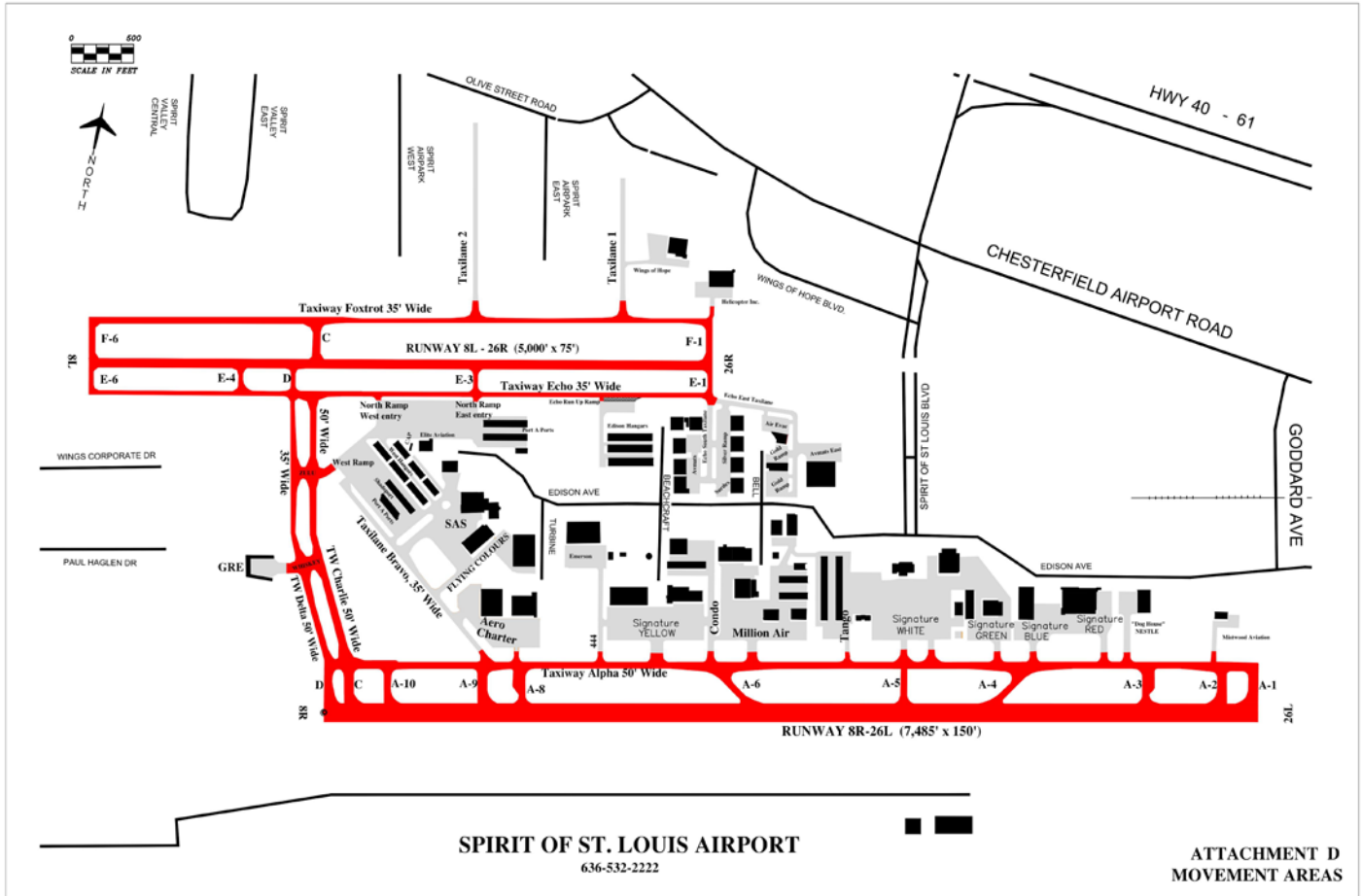


EXHIBIT B

Spirit Airport Layout

EXHIBIT D



Pilot Guide to Airport Signs and Markings

Airport Signs — Action or Purpose

4-22

TWY/RWY HOLD POSITION:
Hold Short of Runway on
Taxiway



RUNWAY BOUNDARY:
Exit Boundary of Rwy
Protected Areas

Also ...

RWY/RWY HOLD POSITION:
Hold Short of Intersecting
Runway



**ILS CRITICAL AREA
BOUNDARY:** Exit Boundary
of ILS Critical Area

8-APCH

RWY APCH HOLD POSITION:
Hold Short for A/cft on
Approach



RUNWAY EXIT: Defines
Direction & Designation of
Exit Twy from Rwy

ILS

ILS HOLD POSITION:
Hold Short of ILS Critical
Area

Also ...

TWY DIRECTION: Defines
Direction & Designation of
Intersecting Taxiway(s)



NO ENTRY: Identifies Paved
Areas Where Aircraft Entry
is Prohibited



OUTBOUND DESTINATION:
Defines Directions to
Take-Off Runways



TAXIWAY LOCATION:
Identifies Taxiway on Which
Aircraft is Located



INBOUND DESTINATION:
Defines Directions for
Arriving Aircraft



RUNWAY LOCATION:
Identifies Runway on Which
Aircraft is Located



TAXIWAY ENDING MARKER:
Indicates Twy Does Not
Continue



**RUNWAY DISTANCE
REMAINING:** Identifies
Runway Length Remaining



DIRECTION SIGN ARRAY:
Identifies Location in
Conjunction with Multiple
Intersecting Taxiways

If in
Doubt
Ask!

ATCT Light Gun Signals

Color and Type of Signal

Aircraft on the Ground

STEADY GREEN

Cleared for
Takeoff

FLASHING GREEN

Cleared to Taxi

STEADY RED

STOP

FLASHING RED

Taxi Clear of the
Runway in Use

FLASHING WHITE

Return to Starting
Point on Airport

ALTERNATING RED/GREEN

Exercise Extreme
Caution

Elevated
Guard Lights
Hold Short



In-Pavement
Guard Lights
Hold Short

Pilot Guide to Airport Signs and Markings

Airport Markings

Help Prevent
Runway Incursions

"READ BACK"
Your Air Traffic
Clearance!



HOLDING POSITION:
Hold Short of Intersecting Rwy
Also Land and Hold Short Marking



ILS CRITICAL AREA:
Hold Short During IMC
Conditions



TAXIWAY/TAXIWAY HOLDING POSITION: Hold Short of Intersecting Taxiway When Directed by ATC



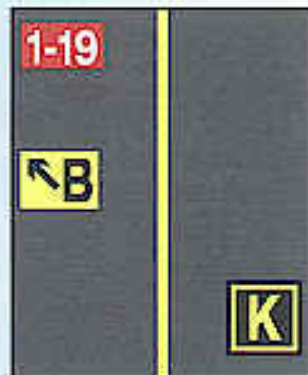
MOVEMENT AREA BOUNDARY:
Defines Boundary of Movement Area and Non-Movement Area



TAXIWAY EDGE: Defines Edge of Usable Full Strength Taxiway Pavement. Adjoining Pavement NOT Usable



DASHED TAXIWAY EDGE: Defines Edge Taxiway Where Adjoining Pavement or Apron IS Available for Taxi



SURFACE PAINTED HOLDING POSITION: Hold Short of Intersecting Runway on Twy

SURFACE PAINTED TAXIWAY DIRECTION: Direction & Designation of Intersecting Twy

SURFACE PAINTED TAXIWAY LOCATION: Identifies Twy on Which Aircraft is Located

EXHIBIT E

Airport Signs and Markings








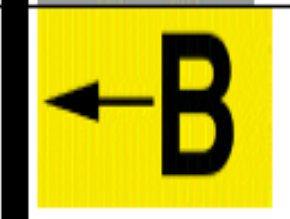






	<p>ILS critical area holding position sign: When the ILS is in use ATC may hold you short of this sign so your aircraft does not interfere with the ILS signal.</p>		<p>Runway boundary sign: This sign faces the runway and is visible to pilots exiting the runway. Taxi past this sign to be sure you are clear of the runway.</p>
	<p>Runway approach area holding position sign: You must hold at this sign until cleared to cross the runway, to avoid interference with runway operations.</p>		<p>Taxiway ending marker: This sign indicates the termination of the taxiway. It is located at the far end of the intersection.</p>
	<p>Taxiway location sign: This sign indicates which taxiway you're on. It may be posted next to direction or holding position signs.</p>		<p>Closed runway and taxiway marking: Located at both ends of permanently closed runways and at 1,000-foot intervals. It is also placed at taxiway entrances if they are permanently closed.</p>
	<p>Runway holding position sign: Until cleared onto the runway you must hold at this sign. In this example, the runway 15 threshold is to the left and the runway 33 threshold is to the right.</p>		<p>Direction sign for runway exit: This sign will indicate the approaching taxiway while on the runway. In this example, taxiway Bravo is approaching to the left.</p>
	<p>Destination signs and location sign: This sign indicates current position and direction to other taxiways. In this example, you are on taxiway Alpha. Taxiway Charlie passes from right to left and Alpha continues ahead to the right.</p>		<p>ILS critical area boundary sign: Indicates when you are safely clear of the ILS critical area. It is located directly beside the ILS holding position markings. While ILS approaches are in use, taxi past the sign before stopping on the taxiway.</p>
	<p>Outbound destination sign: This sign indicates directions to common taxi routes. In this example, runway 27 and 33 are to the right. The dot in the middle separates destinations identified on the sign.</p>		<p>Holding position and location signs: In this example you are on taxiway Alpha; runway 5-23 passes perpendicular to your position. Runway 9-27 passes at an angle starting ahead and left of your position to behind and right of your position.</p>
	<p>Inbound destination sign: This sign directs pilots to destinations on the airport. This example indicates that the military installation is to the right.</p>		<p>Runway location sign: This sign identifies the runway on which your aircraft is located.</p>

EXHIBIT F

Appendix 1.

I, _____, have read and
(printed name)
understand the contents of the publication Ground
Operations Manual on _____.
(date)

(signed)