

# Connections



Secretary of Defense Donald H. Rumsfeld climbs the steps into his Marine One helicopter, shown here parked in front of the Driscoll Terminal Building at Wings Field, for a flight back to the Pentagon.

## Why do all of those planes fly over my house?

If you step outside, look up into the sky, and watch for a minute or two, you are likely to see an aircraft flying overhead. Congratulations! Because you live in the northeastern United States, you are right smack in the middle of some of the busiest airspace in the world.

Most of the aircraft passing over Whipain and Plymouth townships are traveling to or from Philadelphia International Airport (PHL), the nation's 13th busiest airport. Only a small portion fly into Wings Field.

Three-thirds of the 500,000 aircraft operations at PHL this year will pass over Montgomery County. That's nearly 1,400 flights a day. A number of noisy military transports, patrol planes, A-10 fighters and troop helicopters also fly into nearby Willow Grove Naval Air Station each day.

In contrast, Wings Field averages only 107 take-offs and landings a day. Most of the aircraft using the field are small single-engine airplanes, but a typical day brings two small business jets, a few charter and corporate turboprop flights, a half dozen flights by corporate helicopters, and three missions by the PennStar medevac team.

Pilots coming into Wings follow the same three-dimensional, rectangular route that tens of thousands of aviators have flown throughout the 75 year history of the field. This route, known as a *traffic pattern*, is a safety convention that pilots all over the world learn and follow. These "rules of the road" let pilots know where to expect other aircraft in the airspace around an airport.

Airplanes take-off and land into the wind. Because the prevailing winds in the United States blow from the west, two out of three take-offs at Wings head southwest

(Continued on Page Five)

## Why do all of those planes fly over my house?

(Continued from Page One)

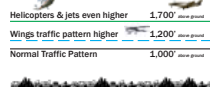
towards Plymouth Meeting Mall. When winds blow from the northeast, take-offs and landings go towards Ambler.

On days when wind conditions favor landings to the southwest on Runway 24, pilots fly a *downwind leg* that takes them at an altitude of about 800' above the ground, they turn left onto the *base leg* and head for Prophecy Creek Park. Approaching the lake and barn in the park, pilots have descended to about 500' above the ground (a 50 story building) as they turn left for the *final approach* to Runway 24. Keeping Shady Grove Elementary School and its playing fields to their right, pilots are about one-half mile from the end of the runway as they descend for landing.

When wind conditions favor landing to the northeast on Runway 6, pilots typically fly a *downwind leg* that takes them south-west-bound from Skippack Pike over Pennlyn Blue Bell Pike until about Germantown Pike. Here they turn left onto the *base leg* and head for Walton Road where they turn left again for the *final approach* into Wings.

To minimize the noise impact on residents, Wings has modified its 75 year-old traffic pattern. Wings is unusual in that the recommended altitude for entry into its traffic pattern is 200' higher (equal to a 20 story building) than most other airports in the United States, and 700' higher for business jets and helicopters. This lessens the overall noise burden on the neighbors who live around the airport.

To reduce noise, the Wings Field traffic pattern is higher than the FAA standard



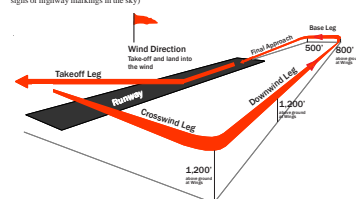
Here's the geography and the noise sensitive areas pilots try to avoid as they fly the traffic pattern at Wings Field.



Safety and the direction of prevailing winds dictate the placement of an airport's traffic pattern and, other than adjustments to its pattern altitude, traffic flow into and out of Runway 6/24 at Wings Field has changed little in 75 years. When Wings opened in 1930, it was surrounded by farms and open space. It was more than 25 years old when township and school district officials decided to build a new school across Skippack Pike near the final approach to Runway 24 and the Archdiocese of Philadelphia built a new school along Walton Road under the final approach to Runway 6. When Wings celebrated its 50th birthday in 1980, it was still surrounded mostly by open space - developers had yet to start construction on hundreds of homes in Whipain Farms, Blue Bell Woods, and Huntsman Lane. Today, Wings Field is an island in the middle of densely populated neighborhoods and office parks.

### Every airport has a traffic pattern

but these are only best practices and guidelines (there are no signs or highway markings in the sky)



## Wings Facts

### 2005 Vintage Aircraft and Classic Car Family FunFest

Thousands of families stopped by Wings Field on Saturday, September 10th, to enjoy the 16th annual event. In addition to the many new and unique vintage airplanes and classic cars (close to 100 on display), the FunFest added an all-new Family Stage featuring award-winning entertainers, strolling performers, children's rides, and hands-on activities.

Net proceeds from the annual event benefit Angel Flight East (AFE), a nonprofit organization of pilots and other volunteers dedicated to serving the community by arranging free private air transportation for medical patients who cannot afford to utilize normal commercial air transportation. AFE pilots also flew numerous missions to

support the Hurricane Katrina relief effort. The organization was founded in 1992 at Wings Field and its headquarters are now on the second floor of the Administration Building. AFE has grown to over 500 members, including 400 pilots who actively fly missions. The organization expects to coordinate over 2,000 missions in 2005, many donated by pilots at Wings Field.

### Whitpain grants building permit for snow equipment garage

Whitpain Township granted Wings Field a building permit on October 25, 2005, to construct a garage to store the airport's highly specialized snow removal equipment. The 40,000 square foot building, which will be located next to the aircraft maintenance hangar, will have four 25' bays. Among the airport's snow removal equipment are a Volvo front-end loader; a snow blower attachment unit; a New Holland bi-directional tractor with a plow blade and sweeper attachment; and an

International dump truck with a plow blade and spreader. No date has been set for the start of construction.



Wings Field's four bay snow removal equipment building will be located near the entrance of the field, next to the administration building (left) and the maintenance hangar (center). The small building on the right is the headquarters for the PennStar medevac unit.



Volvo front-end loader and dump trucks hold specialized equipment for keeping the airport's runway clear when snow storms strike.

## Airport Stuff

### AWOS-3



Wings' Automated Weather Observing System collects and processes weather data 24 hours a day. It then voice broadcasts the data to pilots in real-time via radio and telephone or digitally via the Internet. This data is an essential safety measure for pilots and includes: altimeter density altitude, temperature, dew point, wind speed, direction and gusts, cloud height, and sky conditions.

Whenever you pass by Wings Field you are sure to see a variety of structures and support equipment. Here is some information on three safety devices at the airport.

### Windsock



Landings and takeoffs are always made into the wind. Pilots, therefore, need a visual cue to indicate wind direction. Wind socks are made of flexible fabric and pivot freely to point downwind and show the direction of the wind. Pilots estimate wind velocity by noting whether the sock hangs limply or is stretched straight out. The Wings wind sock is located alongside the runway.

### Beacon



Most airports are equipped with rotating light beacons to make them easy to locate at night. At most civilian airports the rotating beacon alternately flashes green and white. Military airfields beacons like Willow Grove and McGuire flash white, white, green. They operate from dusk to dawn or when the weather has gone to instrument meteorological conditions.

## Famous visitors at Wings Field

You never know who might fly into Wings Field. On Wednesday, August 24th, Secretary of Defense Donald H. Rumsfeld flew into Wings on Marine One, the same type of Sikorsky VH-3D (Sea King) helicopter that transports the president. The secretary was in town for a private event in Lower Merion. According to the Marine One pilot, the Pentagon chose Wings because it was convenient, easily secured, and had necessary support services.

The secretary arrived at the field around 2:30 p.m. accompanied by a giant CH-46 Sea Knight support and troop helicopter. They were back in the air by 7:00 p.m. for the 1-1/2 hour flight back to Washington, D.C.

Wings Field is no stranger to celebrities looking for a convenient air transportation facility in suburban Philadelphia. In its 75 year history Wings has played host to presidents, governors, senators, generals, astronauts, movie stars and athletes. Government officials like Eisenhower, Nixon, Goldwater, Humphrey, McGovern, Heinz, Schweiker, Specter, Shapp, Scranton, Shafer, Thornburgh, Symington and Halsey have landed at Wings.

Celebrities like Bob Hope, Howard Hughes, Danny Kaye, Robert Cummings, Frank Sinatra, Elizabeth Taylor, Eddie Fisher, Cliff Robertson, Yul Brynner, Leonard Nimoy, and others were frequent visitors.

Golfers like Arnold Palmer and Jack Nicklaus flew their own airplanes into Wings when they played in the IVB Golf Classic at the Whitemarsh Country Club.

Who knows who might drop in. John Travolta, Harrison Ford, Angelina Jolie, Tom Cruise, and Dennis Quaid are all private pilots and aircraft owners.



Marine One, a Sikorsky VH-3D helicopter parked on the right, is flanked by a CH-46 Sea Knight support helicopter on the left.

## Issue in Focus About those jets

One of the most controversial issues surrounding Wings Field is the use of the airport by jet airplanes. Some members of the community want them banned. They say that "jets" are too big, too noisy, too polluting, and too dangerous. They also say that the community was never told that jets could use the airport. On the other hand, many others have no problems with "jets." In fact, one neighbor who lives directly under the final approach to Wings Field says that the business jets are quieter and more fun to watch than any other airplane on the field. So what's the real story?

Jets are not a new phenomena at Wings Field – they have been using the airport since 1967 when George Widener and his nephew, F. Eugene "Fitz" Dixon, started basing their Beech King Air 90 turboprop at the field. That same year the airport installed its first storage tank for Jet A, a kerosene-like fuel used to power turbine engines. By the 1980s, helicopters powered by turbine – i.e., jet – engines were regularly using the airport. Today, an average of two small business jets a day come into Wings.

But that's getting ahead of ourselves. Let's start with some definitions. What is a jet? To some, it is a type of *airplane* propelled by a jet or turbine engine. To others, it is a type of *propulsion* or engine.

Take a look at the photograph of the

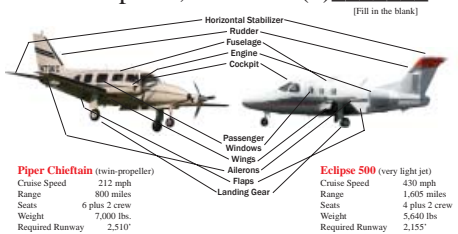
Eclipse 500 to the right, a revolutionary new very light jet. It has wings, a fuselage, rudder, horizontal stabilizer, cockpit, landing gear, flaps, ailerons, and two engines – just like the Piper Chieftain twin-piston engine airplane (pictured next to it) that's been based at Wings for years.

They both have engines, both burn fuel, both have propellers. The only difference is that one engine has pistons moving up and down in cylinders (just like your car motor) to turn a propeller that is mounted outside the engine while the other, the "jet," has a turbine whirling with hundreds of small propeller-like blades attached on a shaft inside the engine.

Both get the job done, it's just that the jet or turbine engine is simpler, has fewer moving parts, is more efficient, is safer, and represents newer technology. The major drawback is that jet engines are more expensive to own, operate, and maintain. But that is about to change.

In 1996, NASA, FAA, universities, and

## If it looks like an airplane and it flies like an airplane, then it's a(n)



the aviation industry formed a research partnership to develop a turbine engine for small general aviation aircraft. Their goal was to design a jet engine that is: environmentally compliant, reliable, user-friendly, simple with fewer moving parts, and reduce the price by 90%. The partnership succeeded in meeting these objectives, and the results will be coming off the assembly lines in coming years.

Technological advancements like these engines are designed to replace older, less efficient technologies. Remember when Mazda came out with its revolutionary Wankel rotary engine to power its automobiles instead of the traditional V8s? – that

was a technological advancement. So too are new technologies like antiscopy and lasers for surgeons instead of scalpels, computers instead of slide rules, microwaves instead of conventional ovens, or MP3s and iPods instead of cassettes and vinyl records.

Some people object to jets because "they are noisier than regular airplanes." This was certainly true in the 1970s and 1980s, but new engine technology has changed that, particularly for small- to medium-sized business jets. In fact, a noise demonstration for the Wings Community Advisory Committee (WCAC) on June 10, 2002, showed that noise levels for a business jet compared favorably with single- and twin-engine

propeller airplanes and noise levels produced by cars and trucks on a highway.

Fumes produced by jet-powered aircraft are another concern for some of the neighbors. Air quality studies conducted for the WCAC project in 2002 projected that over the next 20 years, even with jet activity far greater than any reasonable forecast, pollution levels would be far below any thresholds mandating further study and possible remediation.

In addition, fumes produced by the two business jets a day coming into Wings are only a drop in the bucket compared to the engine by-products produced by the diesel engines that power the Wissahickon School District's 80 school buses and the hundreds – even thousands – of diesel-powered automobiles and trucks that travel the township roads each day.

Airport neighbors were apprehensive when small business jets started flying over their houses after the runway was extended in 2001. With four years of experience, most of those jitters have gone away, but safety is still a concern for some.

Jet pilots are typically the most experienced and best-trained of the more than 600,000 active pilots flying in the USA. Because of the complexity and high costs of these airplanes, owners hire professional career pilots and spend tens of thousands of dollars each year assuring that their aircraft are properly maintained. With operating costs between \$1,000 to \$4,000 an hour, flying these airplanes is serious business. And with insurance costs for even the smallest jets ranging well into the five-figure levels, safety and risk aversion are foremost

in the operating handbooks of business jet owners. In fact, insurance requirements often dictate training and operations.

The other controversy concerning jets relates to allegations by some residents and Township officials that the owner of Wings Field did not alert the community to the likelihood that jets would operate in and out of the airport once the runway was extended in September 2001. That is not true.

On May 19, 1999, Wings officials widely circulated a flyer to the neighborhood that specifically said that jets would not be banned from the field. Township supervisors and the audience at two public hearings -- on June 15, 1999, and January 13, 2000 -- received a flyer that specifically said that jets would not be banned from the field and would most likely use the airport. A photograph of a Cessna Citation, the business jet most likely to use the airport, was submitted to the supervisors at one hearing. One of the owner's expert witnesses, a charter pilot, described the airplanes most likely to use the airport after the runway extension, and he testified that Cessna Citation jets could certainly be among them.

While some people would like limits on jet use of Wings, public airports like Wings, which are part of the federal transportation system (just like I-95, I-76, Pennsylvania Turnpike), must be open to the public without any limitations or any form of discrimination. It cannot deny access to the facility because it is a vital part of interstate commerce. An airport banning an airplane with jet engines (a type of propulsion system) would be like a hospital banning a laser or endoscope (types of surgical tools)

or a school banning a computer (type of learning tool). The FAA would consider a ban on jets to be discrimination, and they would vigorously prosecute Wings in the federal courts -- and win.

So, what does the future hold for jets at Wings Field? The bottom line is that airplanes with jet engines are here to stay. With new technology, turbine engines are quieter, cleaner, and safer. You can expect the volume of the small- to medium-sized business jets that currently use Wings to increase slightly. However, with the introduction of a new generation of very light jets like the Eclipse 500, small airplanes with jet engines will begin to appear with more regularity at general aviation airports around America like Wings.



Two of the revolutionary Eclipse 500 jets (left and center) are shown next to a typical propeller airplane, a Turbo Commander. Two of these small jet airplanes, which weigh less than an SUV, will be based at Wings in 2007.



Interior view of four passenger seats in the Eclipse 500 from the cockpit.



Interior view of the cockpit from the backseat of the Eclipse 600.

## Quiz: Which jets can land at Wings?

Only 14,701 of the 216,971 aircraft in the United States are jets, and most of them are too large to land on Wings Field's runway. Here are photographs and statistics on some of the better-known airliners, military, and business jets. Remember that Wings' only runway is 3,700' long. If a fully-loaded airplane requires more than 3,700', it cannot land at Wings.

 <b>Fairchild A-20A</b> Maximum Weight: 51,000 Seats: 1 crew Minimum Runway: 4,500' <b>No</b>	 <b>Cessna Citation 600</b> Maximum Weight: 11,450 Seats: 2 crew + 5 to 7 Minimum Runway: 5,280' <b>Yes</b>	 <b>Hawker Biplace HS-225</b> Maximum Weight: 24,800 Seats: 2 crew + up to 12 Minimum Runway: 5,800' <b>No</b>	 <b>Boeing 747</b> Maximum Weight: 833,000 Seats: 2 crew + 416 to 568 Minimum Runway: 11,745' <b>No</b>
 <b>Diamond Falcon 2000</b> Maximum Weight: 35,800 Seats: 2 crew + 8 Minimum Runway: 5,440' <b>No</b>	 <b>Learjet 45</b> Maximum Weight: 20,350 Seats: 2 crew + up to 12 Minimum Runway: 4,230' <b>Yes</b>	 <b>Boeing 737</b> Maximum Weight: 133,000 Seats: 2 crew + 126 to 149 Minimum Runway: 7,150' <b>No</b>	 <b>Learjet 31A</b> Maximum Weight: 16,500 Seats: 2 crew + up to 8 Minimum Runway: 3,280' <b>Yes</b>
 <b>Embraer ERJ-145LR</b> Maximum Weight: 45,145 Seats: 2 crew + 50 Minimum Runway: 5,645' <b>Yes</b>	 <b>Cessna Citation Excel</b> Maximum Weight: 20,200 Seats: 2 crew + up to 10 Minimum Runway: 5,900' <b>No</b>	 <b>Lockheed C-8</b> Maximum Weight: 840,000 Seats: 7 crew Minimum Runway: 8,280' <b>No</b>	 <b>Boeing 7/A-130</b> Maximum Weight: 51,900 Seats: 1 or 2 crew Minimum Runway: 4,500' <b>No</b>
 <b>Cessna Citation II/400</b> Maximum Weight: 14,800 Seats: 2 crew + 7 to 11 Minimum Runway: 5,600' <b>Yes</b>	 <b>Gulfstream G-IV</b> Maximum Weight: 41,888 Seats: 3 crew + 14 to 19 Minimum Runway: 5,280' <b>No</b>	 <b>Israel Westwind 2</b> Maximum Weight: 23,650 Seats: 2 crew + up to 10 Minimum Runway: 5,290' <b>No</b>	 <b>Boeingjet 400A</b> Maximum Weight: 16,100 Seats: 2 crew + 6 to 7 Minimum Runway: 3,800' <b>No</b>

## Runway length is a major factor in determining the size of airplanes that can land at an airport

Assuming the pilot applies full power at take-off, every airplane needs a minimum length of runway to accelerate from a dead stop to a speed fast enough to generate lift for take-off. It's a matter of physics, engineering, mathematics, and design.

The minimum runway length is different for each airplane and also varies with the weight of the airplane, the airport's height above sea level, weather conditions, type of runway, and other factors. Each airplane's *Pilot Operating Handbook* contains detailed tables and charts specifying these critical distances and conditions.

Pilots take these tables seriously -- their careers and lives depend on them.

Wings Field's 3,700' long runway is more than enough to safely handle single- and twin-engine, piston-powered propeller and turboprop airplanes. However, it's a different story for certain aircraft in the jet-powered fleet.

Don't ever expect to see at Wings airliners and regional commuter jets like those operating out of Philadelphia International. It's physically impossible. The runway is too short and it cannot be extended. It won't happen. The same is true for military aircraft -- don't expect to see

fighters, bombers, transports, and surveillance jets at Wings. Most of them need extra-long runways.

A study of the business jet market by Wings in 2003 showed that 35 of the 52 models of business jets -- names like Gulfstream, Falcon, Lear, Beech, Hawker, Westwind -- require runways longer than Wings' 3700'. Most of the 17 jet models that could use Wings are the small- to medium-sized business jets in the Cessna Citation series that have been specially designed to operate on short runways like Wings'. But they are the exception, not the rule. In fact, many operators of business

jets in the corporate and charter fleets -- even those with Citations -- will not consider any airport with a runway less than 4,000'.

How do pilots select an airport when they come into Philadelphia?

Their decision-making starts on the ground before take-off as they consider the proverbial real estate question . . . location, location, location. Wings is attractive to many corporate and charter pilots because it

is the closest airport to Philadelphia's suburban business, biotech, and commercial centers. For them, landing at Philadelphia International means another hour of driving time for a meeting in Blue Bell, Plymouth

Meeting, Ambler, Fort Washington, Chestnut Hill, King of Prussia, or the Main Line. But the landing decision is more complicated than convenience, and that's where Wings falls short. Pilots of larger aircraft will change their

minds about Wings when they see that its only runway is 3,700' long. If this is shorter than the design limit for their aircraft, pilots will look elsewhere for an airport with a longer runway -- Northeast

Philadelphia, Chester County, Trenton, Wilmington, or Philadelphia. Safety dictates everything in aviation, and the decision-making typically ends right there with Wings' short runway.

