12 Bad Health Effects of Air Travel you should know about

By Captain Les,
Airline Pilot

Contents

Health Effects of Air Travel:

Passenger's Guide to

Health and Air Travel

In order to become a better-informed air traveler, the physiological health effects on our bodies when we fly as passengers are explained here. Also covered is how to best protect yourself against these adverse health effects.

Airplanes are built to protect us from health hazards

Air travel physiology deals with the physical and mental effects of flight on passengers, flight attendants and pilots alike. Some flying related health hazards can be reduced, while others cannot.

Humans were created to live on the surface as creatures of the ground. Once we discovered how to travel inside fast and high flying jets our bodies had to deal with a whole new set of harsh bodily exposure.

Airlines are competing to allow you to travel with safety, comfort, and style.

Informing passengers about the negative health effects, or physiological aspects of air travel, however, is something airlines have no interest in broadcasting.

Of course, most things we do in life carries a risk. This guide teaches you what you should *really* know about the bad health effects on flying.

Just as we're not going to stop driving cars because of risk exposures we are not going to stop flying airplanes. Air travel is fun and extremely safe, and it's a great way to travel fast and efficiently.

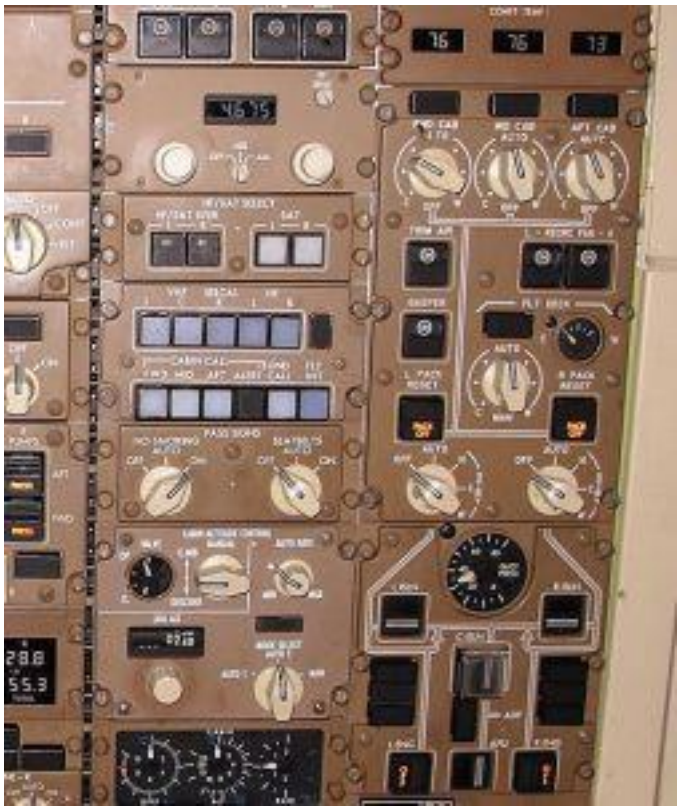
As an airline pilot I happily share information about the great and extremely safe benefits of flying. But I also give honest and realistic answers to the lesser known aspects of air travel, when asked.

How the airplane protects us

Without physical aids, we would not be able to function inside a jet flying thousands of feet above sea level. Pressurized airplane cabins, with its associated air conditioning systems, are such aids.

If it wasn't for pressurized cabins we would not have protection against the rapidly changing pressure of gases (air) and extreme temperatures outside the airplane. The altitude (height) of the air outside the airplane is simply too "thin" to be able to breathe if it wasn't for our pressurized cabins.

The higher you fly the less dense the air molecules are. From about 10,000 feet sea level altitude our ability to breathe comfortably begins to diminish. If the airplane did not protect us at higher altitudes our minds and bodies would seize to function normally.



Cabin pressurization and air conditioning are controlled by your pilots.
Picture: Captain Les

How the pressurization system works - a simple explanation

Airplane cabin pressurization is made possible by the engines creating compressed air. This compressed air is called “bleed air”.

The bleed air is further condensed, conditioned, processed and temperature/airflow regulated. Next it is delivered into the cabin for us to breathe.

The altitude that the airplane maintains inside the cabin is called “cabin altitude”.

Cabin altitude will always be kept at a comfortable level where you can easily breathe (typically below a maximum cabin altitude of 8,000 feet). This while the airplane’s physical altitude may be as high as i.e. 39,000 feet.

In new generation airplanes, such as the Boeing 787, technology has improved the cabin altitude to be much lower. This means much-improved air to breathe for the occupants.

Improved moisture levels in the cabin, as well as quieter engines, are other innovations.
Cabin pressurization is actually the one airplane system responsible for most of the different types of health effects we are exposed to when we fly.

The ultra-modern Boeing 787. Credit: Boeing.

Health Effect #1: Hypoxia

Hypoxia is oxygen deprivation or deficiency in the blood, tissues, and cells to the point where the deficiency causes impairment of body functions. This is described as being in a hypoxic state. The type of hypoxia encountered in an airplane at high altitude is called hypoxic hypoxia. This as a result of oxygen flow interruption to the lungs.

The signs of being in a hypoxic state are many: Rapid breathing, blueing of the skin, lethargy, poor coordination, and exercising poor judgment. Symptoms include euphoria, nausea, fatigue, air hunger, dizziness, headache, hot and cold flashes, tingling and visual impairment.

Inflight hypoxia is treated using onboard portable oxygen bottles or breathing into the oxygen masks if they come down from your overhead compartment.

Here are the hypoxia conditions you should be aware of as an air traveler:

Individually needed hypoxia, where you, as an individual needs more oxygen for any reason. Remember, the air you breathe in the cabin is equivalent of the air you find at high altitudes on earth. You may feel deprived of oxygen, or perhaps for medical reasons, need more oxygen. Always ask the flight attendant for the oxygen bottle. Any qualified medical personnel on board will be requested to assist in helping you.

Alcohol can also induce hypoxia (called Histotoxic Hypoxia). The “thin” cabin air only increases your chances for such hypoxia if you drink excessively while you travel by air.

Airplane pressurization problem or malfunction: Hypoxia may affect everybody in the airplane if cabin pressure cannot be maintained. This as a result of a mechanical fault or a very fast decompression.

A very fast decompression is an extremely rare event, but it has happened. A big enough hole anywhere along the pressurized portion of the airplane (airplane body, door or window) could result in the cabin depressurizing immediately. Oxygen masks will drop for your use.

A very fast decompression is also likely to fog up the cabin, because of the sudden temperature change when outside air enters. The temperature inside the cabin may become very cold with outside air entering too. Depending on the length of the decompression event hypothermia may become a factor.

Oxygen masks, how they work

If the passenger oxygen masks should drop from the overhead compartment make sure you don your mask immediately! If a child or another adult needs help with their mask put your own oxygen mask on first.

Always pay close attention to the Flight Attendant briefing prior to every flight on how to use your oxygen mask!

Passenger oxygen masks get their oxygen from individual generating canisters, producing oxygen from a chemical process. These canisters provide about 12 minutes of oxygen until empty. That gives your pilots time to descend the airplane to a safe altitude where supplemental oxygen is no longer required.

Do not reach up to the panel your mask dropped from. The oxygen canister may reach a temperature of 500 degrees, and you may get burned!

Pilots get their oxygen from separate oxygen bottles (not generating canisters), located by the cockpit.

Passenger Oxygen masks

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The graph below illustrates how important it is to don your oxygen mask immediately, should the mask deploy.

Since every person has a slight difference in the way hypoxia affects them the following graph represents average figures. Other variables include how fast the airplane climbs, physical activity, fatigue of the person, poor nutrition, alcohol, and medications effect:

ALTITUDE	TUC/EPT
18,000	20 - 30 Min
22,000	10 Min
25,000	3 - 5 Min
28,000	2.5 - 3 Min
30,000	1 - 2 Min
35,000	.5 - 1 Min
40,000	15 - 20 Sec
43,000	9 - 12 Sec
50,000	9 - 12 Sec

Source: U.S. Federal Aviation Administration

•**ALTITUDE** represents airplane physical altitude, not cabin altitude.

•**TUC/EPT** means Time of Useful Consciousness: As we get deprived of sufficient oxygen, our mind starts deteriorating and performing poorer, to the point where we finally become unconscious.

For example: Should the masks deploy at 35,000 feet, as a result of rapid decompression/loss of cabin pressurization you would only have between 30 to 60 seconds before you lose consciousness if you don't put your oxygen mask on.

By the way, a complete absence of oxygen will cause death in approximately five to eight minutes!

Health Effect #2: Altitude Induced Decompression Sickness

Donning your oxygen mask if it comes down should ensure sufficient oxygen to prevent hypoxia. An additional, not much talked about danger if you experience a very quick decompression is decompression sickness.

Decompression sickness, or "the bends", is a dangerous condition. The bends happen when the nitrogen in our bodies form into gaseous bubbles affecting our body fluids and tissues. This after exposing our bodies to a rapid pressurization change.

Symptoms of the bends are many but include body pain, visual disturbances, and headache. Left untreated the bends can be life-threatening. The bends are treated by doctors in a hyperbaric oxygen recompression chamber.

Please know that there is a big difference between a rapid (or explosive) decompression and a situation where an airplane is slowly and gradually losing pressurization. Altitude induced decompression sickness is not likely to happen unless you experienced a very fast loss of cabin pressure.

If you ever experience a very fast decompression event make sure you get a medical evaluation as soon as you get back on the ground. Your body just took a "beating", so stay on the safe side by getting yourself checked by a qualified medical professional.

Cabin Air Conditioning

Health Effect #3: Cabin Air, catching an airborne illness

There is a lot of misinformation out there on where it's best to sit on an airplane to minimize the chances of catching a bug from fellow passengers.

There is no such thing as a "safer" seat to avoid catching an airborne bug. If you sit close to a sick person with a nagging cough, however, simply ask to change seat away from that person.

Air is diffused all over the cabin from different locations. Air distribution also varies by airplane type. Varieties include overhead air distribution along the cabin ceiling, individual overhead outlets, sidewall risers, and other air outlet locations.

You are inside a pressurized cylinder where the air is constantly being recycled throughout the entire cabin for a few minutes. Then the air leaves the airplane through the air outflow valves in the belly area of the airplane. More fresh air is produced and the entry-exit cycle continues non stop during your flight.

Recirculation of cabin air

The reason why air is being recirculated with the help of airplane recirculation fans:

It helps save fuel consumption and money, by decreasing bleed air demand from the engines. This, in turn, reduces fuel consumption.

The recirculation fans are associated with air filters, which clean the "used" stale air for redistribution into the cabin. After being recirculated through the cabin for a few minutes, the stale air is dumped overboard to allow fresh air to enter the cabin.

Airlines adhere to strict maintenance procedures for the proper timing of changing of these air filters. However, two scenarios can still possibly make you sick:

The following possibilities are very remote. But, for the sake of information, here it is:

1. Dirty bug infested filters not being changed, as required by aviation authorities worldwide, or

2. Bug infested airborne particles being reintroduced into the cabin, even from new and changed filters.

Health Effect #4: Ear Pain, Sinus, Tooth, or G.I. Tract pain

On the ground, the pressure in your body is equal to the outside air. In the airplane, when you climb or descend the cabin pressure changes, sometimes making your ears “pop”. Trapped gas causes this to happen.

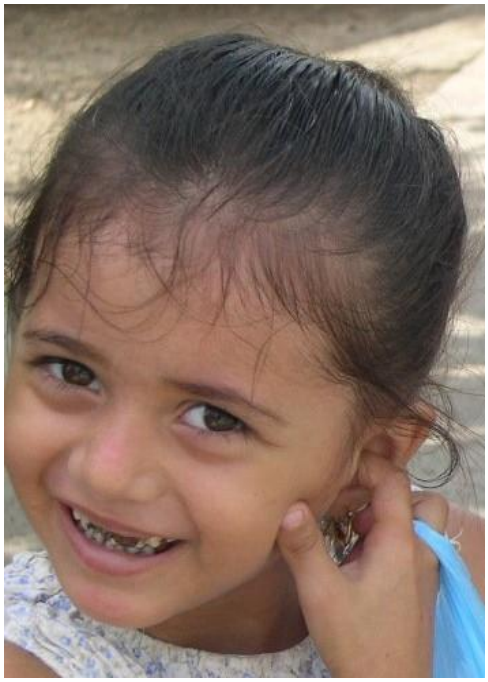
After the pressure inside of your ears equalize with the cabin pressure your ears feel normal again. Sinus cavities, teeth canals, the gastrointestinal tract, and the lungs are also affected by cabin pressurization.

If you fly with sinus or upper respiratory infection problems, such as while having clogged up ears from a cold, the sharp pain can be very bad!

By the way, the pressure differential in the cabin may reach havoc in your baby’s ears. Many of us have experienced that sharp extremely painful feeling in our ears, especially if we fly with sinus problems, such as a cold.

Dr. Robert Heebner, M.D., a former Los Angeles based Federal Aviation Administration Flight Surgeon’s Senior Airman Medical Examiner (AME) explained it this way:

“You may think twice before you let your baby on a flight before the age of two. Children, especially under two years of age, are prone to crying during takeoffs and landings. Since their air canals are smaller, their ears are more susceptible to feeling pressure changes than adult ears. Because landings generally produce a more rapid change in pressurization than takeoffs, landings are usually worse for the child”.



Practical solutions to an ear or sinus block, abdominal air pressure pain, or tooth air pressure pain

Ear or Sinus block:

•Try the Valsalva maneuver, swallow, yawn or chew, to try to equalize the pressure and clear the block.

Here are further solutions, which were typically taught to pilots by flight surgeons. Nowadays pilots can no longer resort to the following, however. The ingredients in these over the counter meds are not compatible with the on the job random drug testing pilots and flight attendants are subject to. Ask your doctor before you take any medication:

•Sudafed: Usually helps, especially if taken half an hour before starting the descent for landing.

•Afrin: If you truly experience a bad ear block, especially on the descent for landing one single dose of Afrin typically clears the ear block immediately. This method was referred to by pilots as "Emergency Afrin" because it truly is a great immediate solution to clear an acute ear blockage for most.

G.I Tract trapped air pain:

•Try to pass the gas.

Tooth trapped air pain (extremely rare, but most likely from i.e. root canal work):

•See a dentist.

The bottom line: Save yourself from the pain. Try to avoid flying altogether if you have a cold or sinus blockage.

Health Effect #5: Cosmic Radiation

What is cosmic radiation?

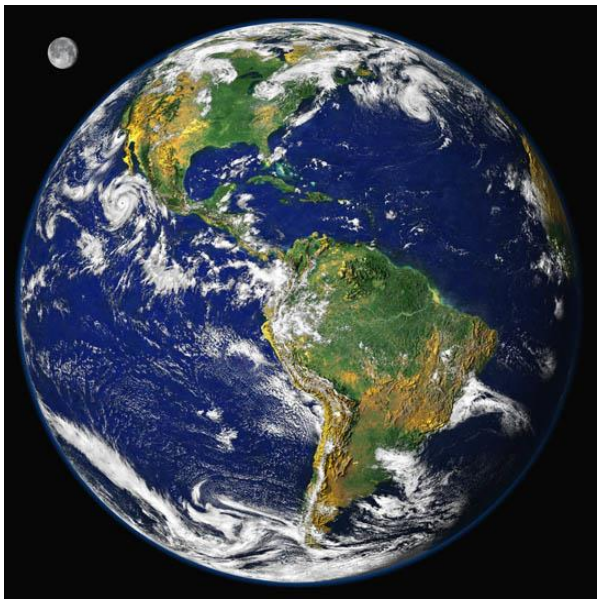


Photo credit: NASA

Our bodies are literally being bombarded with exposure to harmful radiation when we fly. This radiation is called cosmic radiation. Cosmic rays can be further divided into two kinds of radiation:

•Galactic cosmic rays (GCR), emitting from space, originating outside our solar system, and

•Solar energetic particles (protons). Solar energetic particles peak during solar particle events, which occurs from one to 20 times a day.

The higher up we are in the atmosphere the heavier the dose of radiation exposure. Pilots get the most exposure, because of the cockpit windows. Flight attendants and passengers get half the exposure that pilots receive.

How much radiation we are exposed to in an airplane

Studies have been conducted on the harmful effects of in-flight radiation for years. But the impact on our bodies still isn't fully understood.

For instance, a daytime, sunlight flight from Los Angeles to Honolulu in the summer would emit the equivalent radiation exposure of one chest x-ray in each one of your pilots. You as a passenger would receive a dosage half of that.

Do a flight from New York to Hong Kong flying over the north pole, and that one leg would expose each passenger to a radiation dose equal to 6 chest x-rays. Pilots would receive the equivalent dose of 12 chest x-rays on that leg.

The reason for the increased radiation effect flying over the North Pole is due to the hole in the protective ozone layer in that location.

The U.S. Centers for Disease Control and Prevention (CDC) classifies airline pilots and flight attendants as radiation workers. Pilots and flight attendants also have the highest yearly dose of radiation among all workers exposed to radiation in the U.S. This according to the National Council on Radiation Protection and Measurements, a U.S. organization.

If you are a frequent flier passenger you can consider yourself belonging to the radiation-exposed society of crewmembers as well!

Adverse health effects

The long-term health effects from cosmic radiation are unknown. Research has suggested increased possibilities of cancer, as well as birth defects and other damaging organic changes in our bodies. A conclusion or a solution to the phenomena does not appear in sight. NASA is putting a lot of research into protective shielding from cosmic radiation. But so far no cigar.

There is no way to prevent this exposure unless the airplanes are covered in a thick lead protection with no windows. Of course, that is not a realistic solution.

Researching articles on the subject they appear to conclude that pilots (and astronauts) are at a higher chance of getting different kinds of cancer than the rest of the population. Pilots also have a shorter life expectancy than other professional groups. Some research suggests that cosmic radiation may be one contributor to this.

Decades of continuous jet lag, stress, sleep deprivation, sedentary work sitting for hours on end and often unhealthy eating habits add to the contributing factors of pilots typically dying sooner than other professional groups.

Of course, if you only fly occasionally the risk of radiation exposure should not be any more than the risk you take when having x-rays taken at your doctor's office. Even on the ground, we are receiving cosmic radiation but to a much lesser, perhaps insignificant degree.

Health Effect #6: Jetlag

When you fly across different time zones your internal body clock is still stuck in your home time zone. Your body reacts to that by feeling fatigued and "sluggish". This is called jetlag. Your body literally lags in catching up to the local destination time. The more time zones you cross the stronger the adverse jetlag effect on your body will be.

The time required for the recovery of jetlag is also determined upon how many time zones you crossed.

A lot of studies have been conducted on how to best counteract jetlag, and recover from jetlag. The bottom line is, what works for some does not work for others. To understand this subject in better depth and the methods to use for recovery, jetlag has been discussed in detail in my article HERE.

Health Effect #7: Swelling

Swelling of the foot and leg during air travel is common. It is typically harmless unless you suffer from certain medical conditions. The inactivity of flight, sitting in a chair for hours causes blood to build up in the veins of your leg. The pressure in your leg veins is also increased because of the position of your legs.

To minimize swelling and keep your blood flowing you can do some simple exercises while sitting in your seat. You should flex your ankles and extend your feet repeatedly once every hour.

When you get up to use the restroom to take advantage of being on your feet by doing some additional exercises, such as stretching your whole body.

Wearing comfortable, not tight-fitting shoes is also a plus in a pressurized cabin, in anticipation of the expected feet swelling.

Health Effect #8: Bloating

Bloating as a result of sitting in a pressurized airplane cabin is known as "jet bloat". The change in air pressure causes gas inside your body to expand.

Especially noticeable to most is bloating of the stomach. To minimize bloating stay clear of gas-producing foods prior to and during your flight. Beans, broccoli, and carbonated drinks are examples of consumables to avoid.

Swelling and bloating should both dissipate after your flight.

Health Effect #9: Blood clots / Deep Vein Thrombosis (DVT)

The potential true danger of sitting for hours in a pressurized cabin is blood clots, called deep vein thrombosis. Often occurring in the thigh or lower leg area, a clot can block the blood flow in the affected area. The blockage can cause swelling. Worse yet, if the blood clot dislodges and travels to your lungs or other organs it can be fatal!

Get up from your seat, go to the restroom and move around periodically to help prevent blood clots. Compression socks are socks designed to improve blood flow and to help prevent serious medical conditions.

Always check with your doctor before flying. He or she may even prescribe a blood thinner to prevent clotting if you suffer from bad circulation.

Health Effect #10: Hyperventilation

Being in a state of hyperventilation means breathing at a rate faster than normal. In a healthy adult, a normal breathing rate is considered to be from 12 to 16 breaths every minute.

Carbon dioxide gas controls our breathing rate. Self-imposed anxiety and fear can result in hyperventilation.

When faced with anxiety and fear our breathing rate is controlled emotionally instead of chemically. As a result of our carbon dioxide levels (and the hydrogen ion levels of the blood) quickly dropping.

Self-imposed stress hyperventilation is most likely to affect the following categories of air passengers:

•Some first-time fliers.
•People with a fear of flying.
•Passengers reacting to event-triggered hyperventilation, such as during and after a decompression event or an emergency situation.
•Fear of turbulence.
•Passengers feeling stressed about air travel in general.

Symptoms of hyperventilation, besides the increased breathing rate, may include: dizziness, blurry vision, twitching muscles and even muscle spasm.

How to treat hyperventilation

Make a conscious effort to slow your rate and depth of breathing. Remember, fear and anxiety-induced fast breathing is an emotional trigger. If available, breathe into a paper bag to restore some carbon dioxide diminishing from your body with each exhale.

Health Effect #11: Dehydration

The combination of dry air and a high cabin altitude both contribute to dehydration. Dehydration means that the amount of liquid we lose is greater than what we take in.

Symptoms of dehydration include dryness of sinuses, throat, and nose, headache, reduced urination, and thirst. More severe symptoms include low blood pressure, fever and fast heart rate.

The solution to dehydration when flying is very simple: drink plenty of water before and during your flight. Caffeine and alcohol have diuretic properties, which can lead to further dehydration.

Health Effect #12: Medical fitness for passenger air travel

Be safe, see a doctor before flying if you have a medical condition

There are numerous pre-existing medical conditions that can affect your health negatively if you go flying as a passenger. The rather different environmental conditions found in that pressurized tube we call an airplane may worsen your pre-existing condition.

It is always recommended you pre-check with your doctor to find out if flying as a passenger can worsen your already existing medical condition.

You can click HERE for a comprehensive guide if you want to learn more about this subject. This is a guide called Medical Guidelines for Airline Travel, issued by the U.S. Aerospace Medical Association Medical Guidelines Task Force.

Onboard medical issues

Every airliner has basic medical equipment on board, which can be used by any medically qualified professional on board, such as an EMT, MD or a registered nurse.

Your flight attendants are also trained in first aid and the proper use of oxygen bottles. The pilots can contact a designated emergency medicine physician from anywhere in the world, who in turn can give proper medical instructions on any treatment necessary, until safely on the ground.

A medical emergency on an airplane is always a coordinated effort between the patient, any medical personnel on board, the flight attendants, the pilots, the airline company headquarters, and the emergency doctor on call for your flight.

Fear of flying

Another issue affecting many passengers is fear of flying. The fear of flying is very common, but there is help available for that. Simply do a google search for how to overcome the fear of flying. Find one clinic you like and attend their program.

I am sure you have heard this before, but you are many more times likely to get hurt driving to work than you are getting hurt in an airplane. The fear of flying is simply irrational.

Content source credits

- U.S. Federal Aviation Administration (FAA) Flight Surgeon
- The United States Air Force Flight Surgeon
- The United States Navy Flight Surgeon
- NASA
- The U.S. Centers for Disease Control and Prevention (CDC)
- Boeing Corporation
- Dr. Robert Heebner, M.D., Former Senior Airman Medical Examiner

Author Disclaimer

Captain Les:

- is not a medical professional, nor is he qualified to give medical advice to anyone. Thus the matters discussed in this blog is not intended as medical advice, just sharing of common pilot knowledge about medical matters a pilot may be exposed to. Consult a qualified medical professional for any medical advice you may need.

- is a licensed and qualified airline captain and flight instructor with a vast amount of education, knowledge, and experience of all matters relating to his professional qualifications to flying jets as a pilot. This knowledge includes the USAF and the FAA required pilot's general knowledge of aviation medicine.

- is not responsible for any errors, misinformation or omissions in this blog.

Dear fellow Traveler,

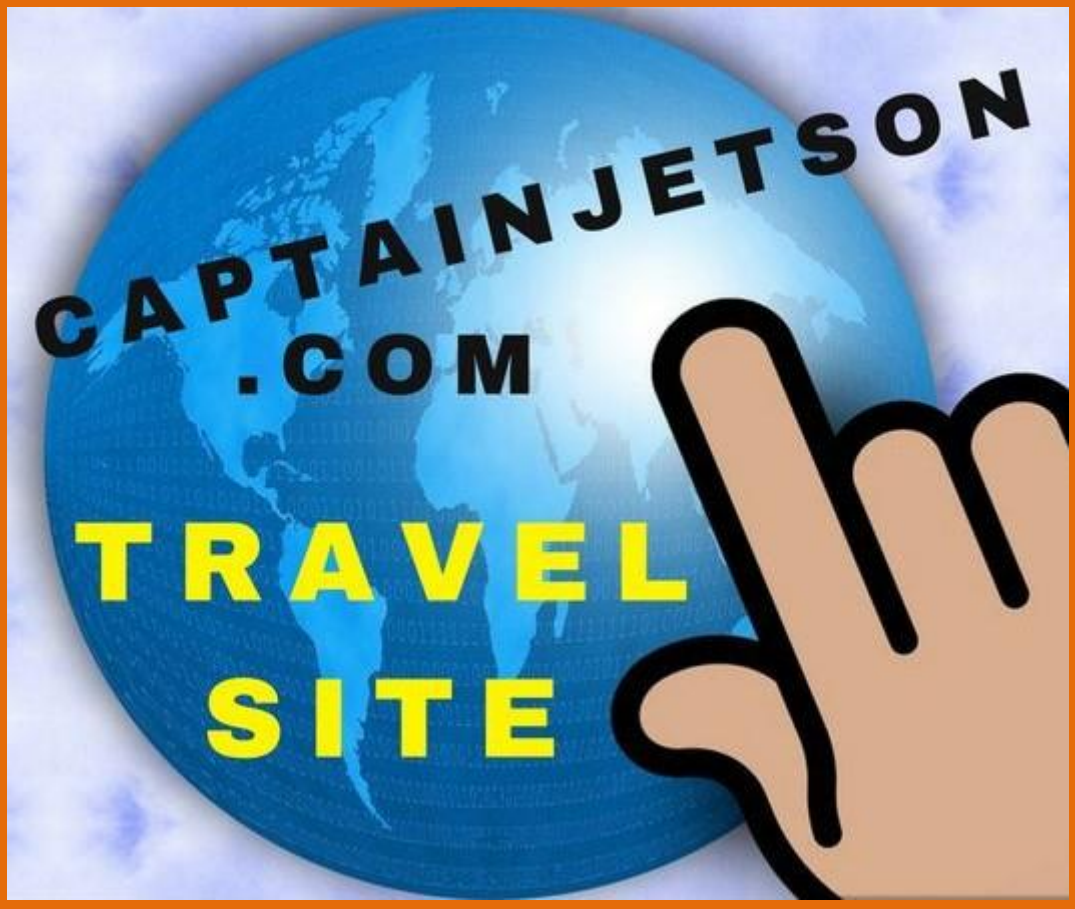
I hope you enjoy travel as much as I do. The website captainjetson.com was established as a hobby of mine to help travelers with the many questions and obstacles they often have with travel planning, tips, ideas and needs.

As a traveler and an airline captain with over 30 years of inside knowledge of the many aspects of travel I get approached all the time on travel advice, specially about air travel.

Don't hesitate contacting me if you have any questions. I love to help people with their travel questions. You can contact me HERE.

Sincerely,

Les



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