



airspace *redesign* project

New York / New Jersey
Metropolitan Area

Newark International Airport (EWR)

Over 21,000 people employed at airport. Contributes \$12 billion in economic activity to the NY/NJ metropolitan area. 120,000 jobs derived from airport activity. \$3.5 billion in wages

John F. Kennedy International Airport (JFK)

Over 40,000 people employed at airport. Contributes \$22 billion in economic activity to NY/NJ metropolitan area. 210,000 jobs derived from airport activity. \$6.7 billion in wages and salaries.

LaGuardia Airport (LGA)

Over 9,000 people employed at airport. Contributes \$6 billion in economic activity to NY/NJ metropolitan area. 65,000 jobs derived from airport activity.

Philadelphia International Airport (PHL)

Employs approximately 15,000 at airport. Total operating budget of \$137.6 million annually. Totally self-supporting, using no local tax dollars.

Americans are flying more these days and the trend will only continue into the future.

Americans love to fly. In this fast-paced society air travel often is the safest, most convenient, and quickest way to travel. In this area alone the numbers of passengers flying from our major airports is staggering. In 1998, Newark International accommodated over 32 million passengers. John F. Kennedy International accommodated over 31 million passengers; LaGuardia Airport accommodated over 22 million passengers; and Philadelphia International Airport accommodated over 24 million passengers. The large number of passengers who come into the region through the airports contributes to the huge economic impact that these airports have on the region. For example, see the information in the margin.

Conversely, enormous negative economic impacts can result from airport delays. The Air Transport Association has estimated that more than 308,000 flights were delayed last year at a cost to the United States airline industry of \$4.1 billion.

And just what causes the delays? The major cause of delay is weather. Another significant problem is that current terminal area traffic flows were designed in the early 1960's. In the last 30 years aircraft types, air traffic control systems, and airport usage have changed dramatically. Also, currently, traffic expansion at Newark International Airport and Philadelphia International Airport are making it difficult to avoid delays in a system not designed to handle such growth.

As you can see, communities receive an enormous positive economic impact from airports.

What can be done to alleviate some of the delays and make the system more efficient? What can the FAA do? (Cont. next page!)

Make a guess?



Want to learn more about how the skies operate? In the next few pages you will find that certain words are highlighted and marked with the symbol on the left. Try and guess the answer to the question in each box. Check your answers using the inserted glossary!

(Cont. from p. 1)

The FAA wants to mitigate the inefficiencies as much as anyone, but it should be remembered that the FAA will never compromise safety in the name of efficiency. The FAA is presently exploring an option that could improve efficiency while maintaining or enhancing safety. That option is an airspace redesign project for the New York/New Jersey/Philadelphia region.

There would be many benefits of a major airspace redesign effort for the region. Among them are:

- ★ Reduced delays at major airports
- ★ Reduced pilot/controller workload
- ★ Enhanced safety
- ★ Reduced adverse environmental impacts (both noise and air emissions)
- ★ Enhanced productivity

The process of airspace redesign is always a difficult process. Our purpose in the airspace redesign project is to involve the public in helping us develop a safer, more efficient airspace system. In the case of the New York/New Jersey/Philadelphia region it is a particularly difficult task. The original airspace design is a complicated one with respect to ingress and egress routes. This region is also an exceptionally busy one, especially on bad weather days. Competition among airline carriers for limited airspace is further complicated by new jet service at smaller airports. Therefore, any airspace redesign will be an arduous process that will take several years to study, make recommendations, and then implement.

What did you call it?

To make this discussion of airspace redesign and air traffic control mechanisms easier, it might be a good time to define some of the terminology generally used in reference to air traffic control. The basics of understanding air traffic control and how it works include knowing the functions of the three principal air traffic control facilities:

The Tower. This is the most recognizable air traffic control function to the flying public. The tower is physically located at the airport and controls traffic on the aprons, taxiways, runways, and aircraft approaching and departing within 5

miles of the airport. Visual contact with aircraft is essential for tower operations. Each of the major airports in the New York/New Jersey/Philadelphia area has a tower.

The TRACON. The Terminal Radar Approach Control (TRACON) facility is often located in the vicinity of an airport. The TRACON is a radar operation center from which air traffic controllers monitor and direct arriving and departing aircraft within 50 miles of the airport.

Each TRACON has responsibility for controlling specifically defined and limited sections of "airspace." That involves ensur-

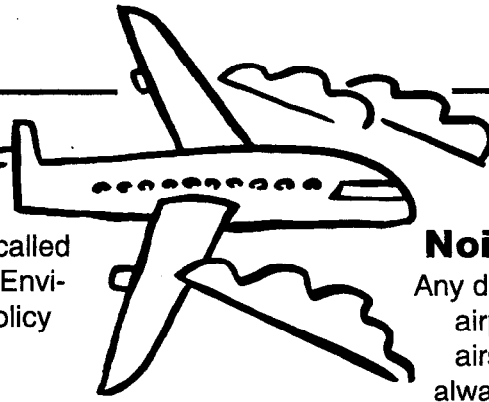
ing that all aircraft entering or departing the airspace are kept separated at safe distances and rerouting aircraft to avoid dangerous weather patterns. A TRACON's total airspace is subdivided into small sections or sectors. Each sector is assigned to an individual air traffic controller who works in the TRACON facility. That controller directs the movement of aircraft in and out of that space on an individual radar screen and maintains radio voice contact with pilots. Although the controller's individual responsibility is only for the area that is visible on his or her screen, all controllers within a TRACON have full radar information on all the aircraft that are under the control of the entire TRACON facility. In addition, these controllers are able to communicate with one another instantaneously – something that contributes significantly to assuring the safety of aircraft passengers.

The Enroute Center: These centers can be located anywhere. The Enroute Center controls aircraft in route between the departure and approach phases of the flight. For example, the Center located in Leesburg, Virginia, controls aircraft from North Carolina to the New York area. They use radar to "see" the aircraft.



What is a **Flight Management System** used for?

Airspace Redesign



An airspace redesign project will examine the movement of aircraft and the placement of aircraft routes within controlled airspace. The FAA will be looking at increased efficiencies and enhanced safety. The development of recommendations for an airspace redesign project will be guided by the need to maintain and improve safety. Trying to keep all aircraft at as high an altitude as is reasonable is one of the FAA's goals. The FAA will also work to take advantage of today's state-of-the-art technology in any redesign project. This sophisticated technology includes the improved performance characteristics of today's aircraft, as well as improvements in navigation capabilities and computer technology.

 What is a **Handoff?**

National Environmental Policy Act

Before an airspace redesign project can be implemented the FAA must comply with Federal laws mandating certain environmental procedures. Environmental impacts concerning air quality, water resources, noise, endangered species, social impacts, wetlands, etc., all come under the purview of the laws. The FAA, willingly and in total compliance and agreement with those laws, works within the

Federal law called the National Environmental Policy Act. (NEPA)

NEPA is the basic national charter for protection of the environment. It establishes policy, sets goals, and provides means for carrying out the policy. NEPA procedures ensure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality and easily understandable by the general public. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA. Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail. In short, the NEPA process is intended to help federal agencies make decisions that are based on an understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. The public is central to this NEPA process. Your opinions matter. Communication between the FAA and the public is vital to the success of this project.

 What is a **Data Link?**

Noise

Any discussion about airplanes, airports, or airspace redesign always includes a discussion about noise. And, just what is noise? Quite simply put, noise is unwanted sound, or sound that disturbs our routine activities. As with sound, we know noise when we hear it. But, just how is noise measured? There are several scientific ways to measure noise that are taken into account during the NEPA process. We are going to look at noise impacts in the communities and minimize them where feasible.

 What is **Radar Vectoring?**

Without becoming too technical, we should explore aircraft noise and its effects on people.

Studies have indicated that communities report themselves slightly more annoyed by aircraft noise than by surface transportation noises. To residents around airports, aircraft noise can be an annoyance and a nuisance. Is there, then, a way to eliminate noise? The

only way to eliminate aircraft noise entirely is to eliminate aircraft from an area. This would mean closing airports or rerouting planes. So, the elimination of aircraft noise may not be a feasible option. (Cont. next page!)

A Review...

The Airspace Redesign Project encompasses the New York/New Jersey and Philadelphia Metropolitan areas and will also include air traffic affecting Connecticut, Delaware, and Pennsylvania.

1

There are more passengers flying in and out of the New York metropolitan area than any other major metropolitan area.

2

John F. Kennedy International Airport, La Guardia Airport, and Newark International Airport are among the 10 major airports with the most delays in the United States. Newark International has seen the most delays in 5 of the last 7 years.

3

In 1998 local delays cost airlines over \$1.1 billion.

4

Inefficiencies due to route structure exacerbate delays and increase noise concerns.

5

Inflexible routes result in large delays in bad weather, including many diverted or cancelled flights.

6

Continued aviation growth is forecast and must be accommodated to keep the local economy strong.

7

Redesigning the airspace in this area will enhance an already safe system.

8

(Cont. from p. 3)
There are, however, a number of ways in which aircraft noise can be mitigated. Advances in technology enable engineers and manufacturers to create quieter engines and aircraft and also provide the means for aircraft to make more rapid ascents and descents. When aircraft get higher faster and stay higher longer, the amount of ground level noise is decreased or mitigated, because there is a direct relationship between the plane's distance from the ground and the amount of noise individuals on the ground can hear. One way then to decrease noise for people on the ground is to find ways to get aircraft higher sooner and allow them to stay higher longer. Airspace redesign has this as one of its goals.

The discussion about noise would be incomplete without a discussion of noise abatement procedures. There is much confusion about noise abatement and just

who is responsible for developing, implementing, and enforcing these procedures. Generally,

noise abatement procedures focus on designing approach and departure paths.

Most major commercial airports are managed by an airport authority. The airport authority is responsible for noise abatement procedures – their development, implementation, and enforcement. The Port Authority of New York and New Jersey is responsible for noise abatement procedures at John F. Kennedy International Airport, LaGuardia Airport, and Newark International Airport. The Philadelphia Airport Authority is the responsible entity for noise abatement procedures at the Philadelphia Airport.

All airport authorities in the United States are required to submit their noise abatement



What is the Sequencing Process?

plans to the FAA for approval. FAA reviews the noise abatement procedures to ensure that they comply with federal safety requirements, but the FAA is not responsible for either the formulation or enforcement of such noise abatement plans.

For more information about this project please call **Mr. Mike Merrill** at 703-620-8404 or e-mail us at faa_tracon@prc.com.



redesign GLOSSARY OF TERMS

a

Airway: A corridor of controlled airspace whose centerline is established by NAVAIDs. Low altitude airways (between 3,000 feet AGL and 18,000 feet MSL) are known as Victor airways and are identified by the letter V. High altitude airways (above 18,000 feet MSL) are known as Jet airways and are identified by the letter J.

Arrival Fix: A geographic point used by air traffic control to mark the transition point between the enroute environment and the arrival procedure used by an aircraft for landing.

Arrival Procedure: A series of directions from air traffic control, using fixes and procedures, to guide an aircraft from the enroute environment to an airport for landing.

Arrival Stream: A flow of aircraft that are following similar arrival procedures.

e

Enroute System: That part of the National Airspace System used by aircraft to travel between terminal areas. The enroute system generally includes airspace above 18,000 feet MSL.

f

Fix: A geographical position typically determined by: visual reference to the surface; reference to one or more NAVAIDs; celestial plotting; or by some other means such as satellite navigation. A fix has a name consisting of five letters when part of airspace structure.

Flight Management System (FMS): A computer system that uses a large data base to allow routes to be preprogrammed and fed into the system by means of a data loader. The system is constantly updated with respect to position accuracy by reference to conventional navigation aids. The sophisticated program and its associated data base ensures that the

g

Global Positioning System (GPS): A Satellite-based radio positioning and navigation system operated by the Department of Defense. The system provides highly accurate position and velocity information on a continuous global basis to an unlimited number of properly equipped users. In addition, GPS allows aircraft to navigate without the dependence of ground based navigational aids.

most appropriate aids are automatically selected during the information update cycle.

Flight Track: The route used by an aircraft in flight.

Free Flight: A safe and efficient flight operating capability under instrument flight rules in which the operators have the freedom to select their path and speed in real time. Air traffic restrictions are only imposed to ensure separation, to preclude exceeding airport capacity, to prevent unauthorized flight through special use airspace, and to ensure safety of flight. Restrictions are limited in extent and duration to correct the identified problem.

d

Data Link: Digital data transmitted between ATC and aircraft computers. This link will provide high-speed flight information data that will be used to safely navigate aircraft during all phases of flight.

Departure: The act of an aircraft taking off from an airport.

Departure Procedure (DP): A published IFR departure procedure describing specific criteria for climb, routing, and communications for a specific runway from the terminal environment.

h

Hand-Off: Passing of control of an aircraft from one controller to another, either within the same facility or inter-facility.

High Downwind Operation: Extended downwind operation that is flown at a higher than standard altitude. (over)

redesign GLOSSARY OF TERMS (Continued)

i

Instrument Approach: An approach to a landing area guided by instruments in the aircraft and on the ground, as opposed to a visual approach.

Instrument Flight Rules (IFR): That portion of the Federal Air Regulations (14 CFR 91) specifying the procedures to be used by aircraft during flight in IMC. These procedures may also be used under visual conditions and provide for positive control by ATC. (See also VFR).

Instrument Meteorological Conditions (IMC): Weather conditions expressed in terms of visibility, distance from clouds, and cloud ceilings during which all aircraft are required to operate using instrument flight rules (IFR).

In-Trail Separation: Distance between two aircraft on an identical route; one aircraft is following another

o

Over-Flights: Aircraft whose flights originate or terminate outside the metropolitan area that transit the airspace without landing.

r

Radar Vectoring: The act of utilizing a heading issued by an air traffic controller to the pilot of an aircraft to provide navigational guidance.

s

Sequencing Process: Procedure in which air traffic is merged into a single flow, and/or in which adequate separation is given between aircraft.

Standard Routings: Preferred route used by air traffic control and assigned to an aircraft flying between two points.

Standard Terminal Arrival Routes (STARs): A published IFR arrival procedure describing specific criteria for descent, routing, and communications for a specific runway from the enroute environment.

t

Terminal Airspace: The air space that is controlled by a TRACON.

Terminal Area: A general term used to describe airspace in which approach control service or airport traffic control service is provided.

v

Victor Airways: Airway Systems based on the use of VOR (very high frequency omnidirectional range facilities). North-South airways have odd numbers (Victor 11) and East-West Airways have even numbers (Victor 14).

Visual Meteorological Conditions (VMC): Weather conditions equal to or greater than those specified in 14 CFR 91.155 for aircraft operations under Visual Flight Rules (VFR).

Visual Flight Rules (VFR): Procedures which pilots may use when weather conditions are above the minimums prescribed for visual flight conditions. Under these rules, pilots may fly with visual reference to the ground and without reference to radio navigational aids. Aircraft operating under VFR are not generally under positive control by ATC.

n

National Airspace System (NAS): The common network of U. S. airspace; air navigation facilities, equipment, services, and airports or landing areas; aeronautical charts, information, and services; rules, regulations, and procedures; technical information, manpower, and material which are used in aerial navigation.

Terminal Radar Approach Control (TRACON): An FAA Air Traffic Control Facility which uses radar and two way communication to provide separation of air traffic within a specified geographic area in the vicinity of one or more airports.

Transition Area: Area of controlled airspace designed to contain aircraft flying IFR during portions of the terminal operation and while transiting from the terminal to the enroute portion of a flight.