

AIRPORT AND TERMINAL-AREA OPERATIONS:
OPERATOR'S PERSPECTIVE

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My name is Arnold Sloane, and I am the Supervisor, Aeronautical Services, Aviation Technical Services Division, Port Authority of New York and New Jersey. Today I am here to offer my views regarding future improvements and initiatives that I believe will enhance airport operations and reduce delays. The growing lack of airport capacity and resultant delays is one of the major problems facing the aviation industry today, and it is expected to become more severe unless mitigating steps are taken. The problem has a "domino effect," spreading to include additional airports and consequently, adversely affecting even the smallest airports because of their interconnection to the growing number of larger, capacity-constrained airports.

Aircraft delay has become an integral part of the operation of our present system of major hub airports. Runway and land-use restrictions, airspace constraints, and environmental considerations have all become factors affecting an airfield capacity which is in many cases already overtaxed during peak periods when aircraft demand exceeds airport capacity.

The Port Authority operates three major airports, John F. Kennedy International, La Guardia and Newark International Airports, none of which are strangers to this phenomenon and considerable delay is experienced each year as over a million aircraft operations at these three facilities are combined with an additional 1.2 million operations, from three other air carrier and nine general aviation airports which are all in proximity.

Kennedy, La Guardia and Newark Airports alone serve the Nation's seven busiest city-pairs and fourteen others ranked in the top twenty-five, while handling nearly 50 million passengers each year. Delays experienced at these airports have a serious impact on the traveling public.

Constraints resulting from airspace interactions between La Guardia and Newark, and La Guardia and Teterboro Airports, plus a similar impact resulting from operations at a number of small general aviation airfields in the area, produce additional congestion and delay.

In an attempt to alleviate congestion and delay at the New York airports in 1969, Kennedy, La Guardia and Newark were designated as High Density Traffic Airports by Federal Aviation Regulation. A limit on the number of operations during the peak hours at each airport was imposed. Shortly after the rule was adopted, Newark's allocations were suspended because the airport's operational volumes did not exceed the allocated quota. As you are aware, Newark's traffic volume has, in the last few years, risen sharply as have delays.

In order to quantify the problem, we can compare some recent FAA statistics on delay. FAA issues a National Airspace System (NAS) Performance Report based

upon their criteria of "aircraft delayed 15 minutes or more". When the first five months for 1986 are compared with the same period in 1985, delays, nationally, for 1986 were 18% higher than in 1985, while movement rates at the 22 pacing airports increased by an average of 4%, from 3.6 million to 3.75 million. At the Port Authority airports, the number of aircraft delayed increased 32% at Kennedy International, was reduced 3% at La Guardia Airport, and increased 47% at Newark International Airport while corresponding movement rates decreased 11% at Kennedy and showed no change at La Guardia and increased 11% at Newark.

Unless additional capacity can be obtained, delay in the future will continue to grow. The Port Authority forecasts that by 1990 the daily volume of operations at La Guardia to be 1100 and at Kennedy 1200. Newark was subjected to a similar analysis. By 1990 Newark is expected to accommodate over 1500 daily operations.

We believe that improvements to airspace procedures, and airports, can significantly increase future airport capacity and reduce delays.

Let us look first at suggested airspace procedure improvements.

A Wake Vortex Alleviation System should be developed. This would provide increased airport capacity by allowing reduced aircraft separation standards under certain meteorological conditions.

FAA should pursue development of devices to measure wake vortices directly, and measure real-time wind profiles in both approach and departure zones. The device should include a vortex sensor, which would incorporate wind shear or wind-shear sensing capability. Research should also be conducted to determine whether wake vortex restrictions can be eliminated when steady crosswinds are present.

The New York Airport Improvement Task Force, a group composed of representatives of the airlines, FAA and the Port Authority, found, as early as 1980, that at La Guardia alone, a Wake Vortex Avoidance Program could, in terms of time lost, save aircraft operators as much as \$8.5 million annually.

The FAA should also evaluate the possible redefinition of "heavy aircraft." This could result in the reclassification of aircraft such as the DC-8, B767, A300/A310 to "large", rather than "heavy". (The A310's maximum gross weight is around 305,000 lbs.)

Boeing advises that 201 Boeing 767s have been ordered; 133 delivered and that a backorder of 60 exists. Airbus Industrie states that they have a commitment for 263 A310-A320s to be delivered by 1989. The same firm advises that 256 A300s have been delivered with 17 on back order. All are classified as heavy". If these aircraft could be classified as "large", instead of "heavy", in-trail separations would be reduced, resulting in substantial increase in airspace and airport capacity. This increase in airport capacity will be particularly important at an airport like La Guardia where the A300/310/320 and B767 fleet is forecast to greatly increase over the next few years.

In addition to wake vortex research, noise abatement constraints should be reviewed.

Many current noise abatement procedures are based on requiring aircraft to fly along tracks that result in the least noise in the community. The resulting inflexibility of the airspace use has diminished the ability to maximize arrival and departure routes to a runway, and in the case of parallel runways, this inflexibility has in many cases eliminated the independent capability that was originally designed into parallel runway systems.

The new generation of Stage 3 quieter aircraft may allow the opening of previously restricted overflight areas. These aircraft can utilize other departure/arrival paths and yet not present a significant noise nuisance.

The benefit is that additional departure/approach paths will increase airport capacity. For example, the New York Airport Capacity Task Force has found that if it were possible to permit departures from John F. Kennedy's Runway 31L to turn left, while simultaneous departures from Runway 31R turn right after departure, a large increase in departure capacity would result. It may be possible to permit Stage 3 aircraft to make this maneuver. The right turn off 31R is prohibited at this time because of noise constraints.

There are several modifications or improvements to Terminal-Area Air Traffic Control Procedures which offer benefits to airport operations and other speakers have or will mention them also and the fact that some or all, are not new suggestions, however and specifically:

1. Develop, test and demonstrate the safe introduction of independent IFR parallel approaches to runways separated by a minimum of 3000 feet between centerlines. We believe that permitting approaches to parallel runways as closely spaced as 3000 feet during IFR weather is feasible if a high-accuracy, fast-update radar is used to monitor the parallel approaches. The concept was simulated at the Memphis Airport during 1984. However, results of the simulation effort are not available at this date. FAA indicates that benefits of this procedure would be very high at a number of U.S. airports with closely spaced parallels.
2. Establish standards for converging IFR approaches with the appropriate operating guidance. Converging approaches in instrument conditions offer the potential for significant capacity increases at certain airports. For example, of the top 30 air carrier airports, 25 have at least one set of converging approaches. If the airport does not also have the independent parallel approaches, independent approaches to converging runways could, base upon studies by FAA, increase arrival capacity in low-visibility conditions by 36-100 percent over the best currently available configuration.
3. Undertake the research necessary to provide for higher glide slopes for smaller aircraft. These higher glide slopes could prove useful when permitting heavy jets to operate to one runway and smaller aircraft to operate another parallel runway spaced less than 2500 feet away from the heavy jet runway. At those airports with higher glide slopes, small capacity gains could be realized. These airports would also have to have "staggerd" runway thresholds further enhancing the ability of the samller aircraft to stay above the wake turbulence of the heavy jet.

4. Give high priority to improving common use of certain airspace sectors at hubs having multiple airports. For example, the Expanded East Coast Plan (EECP) will permit the flexible use of enroute airspace and thereby improve efficiency.
5. The Expanded East Coast Plan is expected to effect substantial air route and procedural changes with the objective of:
 - (A) Restructuring routes to and from the New York metroplex to complement revised and improved terminal area procedures.
 - (B) Reducing traffic delays between Chicago, New York, Atlanta and Miami.
 - (C) Adjusting of arrival and departure corridors to provide airspace users and air traffic control the best operational configuration.
 - (D) Improving en-route traffic metering and optimizing descent profiles.

The Plan's major benefits are that it will permit fewer restrictions on departure climbouts and higher initial altitudes. The bottom line of the Plan is an enhancement of capacity in the New York area.

However, the Expanded East Coast Plan is not meant to study or modify that airspace in very close proximity to airports. A "follow-on" to the Plan should be conducted to evaluate this close-in airspace to determine whether or not further airspace improvements can be made.

6. Expedite the development of the curved/segmented MLS approaches and multiple glide paths by air carriers and commuters and accurately assessing their contribution to increased airport capacity.

Two major benefits for the development of curved approaches are immediately identifiable in our area. When Kennedy is forced to use Runway 13L for approach during low visibility conditions aircraft must use the ILS to that runway. The final ILS approach course to 13L crosses the missed approach path course to La Guardia Runway 22, forcing that airport to operate on one runway. If an MLS curved path approach were available, the Kennedy arrival to Runway 13L/13R could use an approach path that would approximate the Canarsie VOR approach and remain well clear of the La Guardia airspace giving La Guardia added capacity during low visibility conditions.

Additionally, when La Guardia is forced to use Runway 13 ILS, the final approach course passes directly over Teterboro Airport restricting departures from that airport. If a curved-path MLS approach were available, aircraft to La Guardia's Runway 13 could use the path described by the Hudson River VFR approach and remain well clear of Teterboro.

Secondly, let's address airport improvements.

The installation of Airport Surface Detection Equipment will assist air traffic control move aircraft. ASDE however still must operate on a "line of sight" basis and is subject to weather interference. Research into an advanced system for the provision of surface movement guidance and control should be pursued. In the past, the Transportation System Center initiated research in such areas as Surface Traffic Control System (STRACS), Trilateration, and other candidate means of surface movement detection. This research was terminated and no effective system developed. A return to research in this area in light of today's technology should be reintroduced.

The previously mentioned reduction of GA aircraft at air carrier airports will clearly and greatly reduce delay and increase capacity at these airports. But, in addition to this unpopular action and in view of the rapidly growing traffic at the major airports and their limited potential to increase regional capacity, it is important to study other solutions. One possible alternative that would afford major capacity relief is the development of a system of VTOL facilities strategically located in the City Centers to serve the significant short-haul passenger markets and remove this activity from the airport. Recent aircraft developments such as the experimental Bell XV-15 Tilt-Rotor, the Sikorsky X wing, the planned larger generation helicopter, together with the All Weather Capability Heliport Demonstration Program sponsored by the FAA could make VTOL short-haul, city-to-city service practical.

In order for this alternative to be viable, a series of helicopter-related initiatives must be pursued simultaneously and expeditiously. These are:

- (1) Development of air traffic control programs to adequately phase in non-interfering helicopter operations.
- (2) Encouragement and financial support (Airport Development Aid Program) of public use heliports or helipads for city center and suburban activity away from metropolitan airports.
- (3) Development of "all weather capability" at helicopter landing areas and improved visual and electronic landing aids for helicopters.
- (4) Development and implementation of ways to accommodate community acceptable low-level VFR, special VFR-IFR (or combination thereof) helicopter routes to utilize airspace not used for airplane approaches.
- (5) Study rotor downwash effect of various helicopters on other helicopters and light aircraft traffic so that it will be possible for these two types of aircraft to operate in close proximity at the same pad safely.

Finally, in closing, and noting that we will soon hear a presentation from a manufacturer with respect to aircraft improvement, keep in mind that aircraft of the future must be accommodated at today's airports. The lack of available land to provide expanded runway/taxiway separation required for super-sized aircraft will preclude the acceptance for the super-sized aircraft being discussed today.