STATEMENT OF JOHN H. SHAFFER, ADMINISTRATOR, FEDERAL AVIATION ADMINISTRATION, DEPARTMENT OF TRANSPORTATION, BEFORE THE SUBCOMMITTEE ON TRANSPORTATION AND AERONAUTICS OF THE HOUSE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE, ON DECEMBER 3, 1970, RESPECTING AVIATION SAFETY

Mr. Chairman and Members of the Committee:

I have with me today Mr. Oscar Bakke, our Associate Administrator for Plans; Mr. George Carneal, our General Counsel; Mr. Cliff Walker, our Deputy Associate Administrator for Operations; and Mr. James Dow, our Director of Budget. Other members of the staff also are present and available to answer specific questions. I welcome this additional opportunity to appear before this Committee to discuss a primary mission of the Federal Aviation Administration: Aviation Safety.

We can point to the identifiable benefits resulting from the cooperative effort of the Executive and Legislative Branches of Government. Consistently over many years, the trend is toward increasingly safe aviation operations -- whether you look at the rates in terms of passenger miles, hours of aircraft operation, or takeoffs and landings. The fine safety record of our newest air transport -- the Boeing 747 -- in the first 10 and one-half months of airline operation demonstrates that this trend continues.

Both the air carrier and general aviation segments of civil aviation have established voluntary programs to improve the aviation safety record. We applaud them for their effort, and we have taken

additional actions as well. We have held two National Aviation System Planning Review Conferences, the first in 1969 and a second in 1970. We have provided the Committee with copies of the current 1971-1980 National Aviation System Plan for the hearing record. Our third Conference is scheduled for April 1971, when we will consider a revised Plan for 1972-1981. The Plan, and the planning cycle on which it is based, will ensure the increasingly efficient use of the resources we have.

We have issued several new regulations to improve aviation safety, and we are considering others. Several regulatory changes enhance the safety requirements for air taxi operators and the airworthiness standards for the aircraft they use. We have initiated a series of amendments to our air traffic rules to establish Terminal Control Areas around our busiest airport terminals. We have issued a rule (with the strong support of the general aviation industry) to prohibit persons from acting as crewmembers on civil aircraft within 8 hours after consuming an alcoholic beverage. We have stepped up our "Project 85" Program that stresses more education and tighter enforcement of general aviation operations. Other major safety regulatory actions taken during 1969 and 1970 also are summarized for you (in Exhibit 1). During Fiscal Years 1969 and 1970, we hired 4,800 more air traffic controller specialists. Many of them now are in some

phase of training, although some of the earliest that we have hired have completed their training and assumed controller duties. As you know, we recognize the importance of our controllers to aviation safety, and we have forwarded to this Congress a legislative proposal that would enable us to work with them to solve the long-term problems they face. We have commissioned 316 new air navigation and air traffic control facilities. We have initiated the procurement of 863 more of these facilities that are scheduled for commissioning over the next 24 months. We have furnished more detailed information on these facilities (in Exhibit 2).

Now, using the Instrument Landing System (ILS) as an example, I would like to outline the way we use one of our resources -- the air navigation facility -- to enhance the safety and efficiency of the aviation system. An ILS, in layman's terms, is an electronic device that transmits a signal along a three degree glide slope (path of approach). Matched equipment in the aircraft receives this signal and displays on an instrument to the pilot where his aircraft is in relation to the glide slope.

We will start with airports that do not have an ILS. For example, to begin an approach to land under instrument flight conditions at Myrtle Beach, South Carolina, airport (which has no ILS),

the minimum descent altitude is 607 feet above the runway, and the visibility must be one mile.

For an air carrier or "large" commercial operator, an FAA inspector examines the aircraft equipment, crews, and the facilities at each airport served, and the FAA then establishes appropriately safe minimums. These minimums are conservative, but they may be lowered depending on proficiency of the flight crews, the aircraft (avionics) equipment, and the presence of certain navigation aids at the specific airport. The FAA then issues specific "operations specifications" under the regulations (such as Part 121 for a domestic air carrier) which state precise minimums for operations into the airport under adverse weather conditions. These operations specifications actually are individual rules that are tailored to a specific operation. We consider all of these factors for each airport without ILS. We ensure that the operations are safe by adjusting these minimums, operator by operator.

What happens when we introduce an ILS at the airport? With ILS, we look at the approach path (especially for any obstructions) to see whether, with the ILS operating, we can lower the minimums. This usually results in changing the air carrier operations specifications. Thus, a principal advantage of the

ILS is to allow landings when unfavorable weather reduces ceiling and visibility, and to do this with the same degree of safety as the higher minimums (without ILS) provide. The ILS also enhances the schedule reliability of air carrier service to a particular community, because operations can continue under weather conditions which would prevent them without ILS. Thus, ILS enhances both aviation safety and efficiency of aviation.

Significantly, an ILS is expensive to buy and to maintain. This sensitive electronic equipment requires "fail-safe" design and maintenance to ensure continuing operational accuracy and to prevent a reduction of accuracy that would make the ILS unsafe. Ground monitoring continuously ensures that the signal emitted is radiating properly. If not within the close tolerances required, the ILS alarms and shuts down, and we notify the users who then follow minimums set on the assumption that there is no ILS. But this ground monitoring alone does not suffice. Technical experience over the years shows us that geographic and climatic factors (terrain, weather, seasonal changes) may lead to an "untrue" signal in the air, although the ILS seems to emit a true signal on the ground. Therefore, in-flight monitoring is also necessary using FAA flight inspection aircraft which are specially instrumented and equipped with sensitive electronic equipment. Each navigation aid

(like the ILS) is routinely flight checked for accuracy. So that nobody reading this will conclude that these nav-aids are unreliable, we have furnished data showing the high percentages of reliability of the installed navigation aids (in Exhibit 3).

The ILS is an example of a navigation aid that enhances aviation safety and efficiency. With one or two exceptions, ILS is installed and operating at each of the 85 airports which serve 90 percent of the air carrier passengers enplaned in this country (Exhibit 4). But, before we allow the operation of air carrier and general aviation aircraft into these airports, or into those airports not having an ILS, we (and particularly our air carrier and general aviation operations inspectors) do all that we are able to make sure that those operations are safe.

Chairman Reed is describing for you what we know about the three tragedies that occurred in Colorado, West Virginia, and Alaska. There are a few highlights that I wish to emphasize: (1) The only clear similarity between these three accidents is that the three different aircraft involved were under a charter; (2) Two of the three operators (Southern and Capitol) are certificated by the Civil Aeronautics Board and are holders of air carrier operating certificates issued under Part 121 of the Federal Aviation Regulations, while the third (Golden Eagle) was conducting a charter operation of a completely different character; and (3) Each

of the accidents occurred at different points in the operation -- West Virginia on landing, Alaska on takeoff, and Colorado en route.

Air carriers and reputable commercial operators conduct charter operations with a high degree of safety. Basically, the same safety regulations that apply to scheduled air carrier operations apply to air carrier charter operations. This is a real service to aviation and the public. Homogeneous groups, possibly including many people who would never fly scheduled air carriers, fly in chartered aircraft. Professional baseball, basketball, and football teams charter aircraft. This is an established part of the business of many of our largest domestic and flag air carriers and foreign air carriers, and their safety record is a proud one.

Mr. Chairman, aviation safety is improving. None of us today can say that aviation safety will ever be perfect - no accidents, no fatalities. But that is the goal for which we strive. With wise management of our resources and with the continued support of the Congress, we approach closer to that goal day by day.

That concludes my prepared statement, Mr. Chairman. My associates and I will be pleased now to respond to questions you may have.

EXHIBIT 1

OTHER MAJOR SAFETY REGULATORY ACTIONS TAKEN DURING 1969 AND 1970

Amendments 43-12, 91-67, and 135-9

Issued on September 8, 1969
Subject: Air Taxi Operations with Large Aircraft

These amendments require air taxi operators using large aircraft to comply with the rules of Part 121 that are applicable to domestic, flag, or supplemental air carriers, as appropriate, and give air taxi operators the same maintenance privileges that air carriers now have under Parts 43 and 121. Large aircraft are operated in Part 135 operations under the exemption authority of Part 298 of the economic regulations of the CAB. Part 135 was not suitable to cover these operations of large aircraft. These amendments were issued to ensure that appropriate regulations are applied when large aircraft are used in air taxi operations.

Amendment 121-52

Issued on September 11, 1969
Subject: Deviations from Qualifications Requirements for Chief Pilots

This amendment allows deviation from the requirement for three years pilot-in-command experience for a chief pilot when the Administrator finds that the applicant's aeronautical experience is equivalent to three years of experience as pilot-in-command of a large aircraft with an air carrier or commercial operator. The FAA has granted petitions for exemptions to persons who wish to serve as chief pilot when these persons show that they have sufficient aeronautical and managerial experience to fulfill the purpose of the regulation, although they do not have the required pilot-in-command experience. Through issuance of this rule, the agency implements the policy expressed in the granting of several exemptions.

Amendment 61-44

Issued on October 16, 1969
Subject: Certification of Pilots and Flight Instructors; Miscellaneous Amendments

This amendment introduced a number of changes to Part 61, including the following:

(1) The minimum total pilot flight time required by §61.145(b)(2) for an airline transport pilot certificate was increased to 1500 hours (from 1200 hours within the eight years before the date of application), and the requirement was deleted that this time must include five hours in the 60 days before the application.

(2) A commercial pilot is allowed, under specified conditions, to credit toward that flight time a limited amount of flight engineer flight time, carried out while participating in a Part 121 pilot training program.

(3) A commercial pilot is allowed to credit toward that flight time all of the flight time logged in Part 121 operations as second-in-command of airplanes required to have more than one pilot by their flight manuals or airworthiness certificates.

(4) An applicant is allowed to substitute one night takeoff with a landing to a full stop (after completing 20 of them) for each hour of required night flight time, up to 25 hours.

(5) An applicant for an airline transport pilot certificate with an airplane rating is required to have the minimum of 250 hours of flight time as pilot-in-command of an airplane (or as copilot, performing the duties and functions of a pilot in command).

(6) The certificate endorsement reference in §61.145(c) is changed from 250 hours to 150 hours to make it consistent with Annex 1 of the Convention on International Civil Aviation.

(7) Several obsolete or inconsistent provisions were deleted.

Amendment 135-12

Issued on November 26, 1969
Subject: Additional Operating Rules Applicable to Operations for Compensation or Hire with Small Aircraft

The amendment adds the following main requirements to Part 135:

(1) Each operator must have a Manual for guidance of its personnel.

(2) Each operator must have a flight crewmember training program.

(3) Each pilot is to be flight tested by the FAA or a check pilot each 12 months.

(4) Daily flight time limitations are established.

(5) Minimum experience requirements for pilot-in-command of IFR flight are raised from 500 to 1,200 hours.

(6) Two pilots are required if the aircraft has a seating configuration for more than nine passengers.

Amendments 61-45 and 121-55

Issued on December 22, 1969
Subject: Training Programs

These amendments update procedures for the approval and revision of air carrier training programs, provide for more extensive use of airplane simulators in training, allow improvements in the operation of training programs and the quality of training provided for crewmembers and dispatchers, and make general clarification with respect to these training requirements.

Amendments 23-8 and 25-21

Issued on December 31, 1969
Subject: Maintenance Manual Requirements

These amendments require that maintenance manuals be provided to the owners of Part 23 (normal, utility, and acrobatic category) and Part 25 (transport category) airplanes at the time of delivery, and prescribe a number of items that must be considered for inclusion in these manuals.

Amendments 25-22, 91-71 and 121-57

Issued on December 31, 1970
Subject: Additional Attitude Instruments in Large Turbojet Aircraft

These amendments require a third attitude indicating instrument, operating from a source of power independent of the normal electrical generating system, on all large (more than 12,500 pounds) turbojet powered airplanes operated by air carriers and commercial operators under Part 121. They also permit certification under Part 25 (Transport Category Airplanes) and operation either under the general operating and flight rules of Part 91 or under Part 121 of a large airplane without a gyroscopic rate of turn instrument installed, if the airplane is equipped with a third attitude indicating system. Air Travel Clubs operating large turbojet aircraft under Part 123, and Part 135 Air Taxi Operators and Commercial Operators of Small Aircraft operating large turbojet aircraft in accordance with the operating rules of Part 121, are also subject to the new requirements.

Amendments 65-14 and 147-2

Issued on March 27, 1970
Subject: Aviation Maintenance Technician Schools - Name, Operations, and Curriculum

These amendments change the name of "mechanic schools" to "aviation maintenance technician schools", provide more specific guidelines for the certification and operations of these schools, and provide new minimum curriculum requirements for both their certification and operations.

Amendments 23-9 and 91-75

Issued on April 13, 1970
Subject: Installation and Operating Requirements for Oxygen Equipment and Supply

These amendments provide standards for the installation of oxygen equipment on airplanes certificated under Part 23 (Normal, Utility, and Acrobatic Category), and provide operating requirements for the use of oxygen in aircraft governed by Part 91 General Operating and Flight Rules.

Amendments 25-24, 91-76 and 121-60

Issued on April 29, 1970
Subject: Requirements for Attitude Instrument Replacement of Rate-of-Turn Indicator

These amendments require that the third attitude indicating instrument system be capable of providing reliable reference through 360° of pitch and 360° of roll when that instrument replaces the gyroscopic rate of turn indicator, as authorized by Amendments 25-22, 91-71 and 121-57.

Amendment 101-3

Issued on May 19, 1970
Subject: Hazardous Operations of Moored Balloons and Kites

This amendment prescribes additional regulations governing moored balloon and kite operations that were found to interfere with other aircraft operations, but that were previously excepted from regulation under Part 101 by virtue of the size, capacity or weight of the balloon or kite.

Amendment 135-18

Issued on June 12, 1970
Subject: Additional Airworthiness Standards for Airplanes With 10 or More Passenger Seats

This amendment requires that, after May 31, 1972, small reciprocating engine and turbo-propeller powered airplanes having 10 or more passenger seats meet certain additional airworthiness standards, and require operation of these airplanes in compliance with specified performance operating limitations. The new airworthiness standards require, after May 31, 1972, that the affected airplanes either (1) be certificated in the transport category, or (2) meet additional standards, incorporated in a new Appendix A to Part 135. Among other things, new Appendix A to Part 135 covers flight requirements, performance, trim, stability, stalls, control systems, instrument installations, operating limitations, airplane flight manuals, flight loads, ground loads, fatigue evaluation, flutter, landing gear design, personnel and cargo accommodations, fuel system components, powerplant cooling, induction system, exhaust system, powerplant controls and accessories, fire protection, and systems and equipment.

Amendments 25-25 and 121-66

Issued on August 12, 1970
Subject: Additional Flight Recorder Data and Other Requirements

The purpose of these amendments was to:

(1) Increase the recorded flight data required by Part 121 for large airplanes, for which a type certificate is issued after September 30, 1969, that are turbine powered or certificated for operation above 25,000 feet altitude;

(2) Change the requirement for keeping the recorded data;

(3) Require a means to automatically present the data erasure after crash impact on recorders that erase and re-use tape;

(4) Require a device to assist in the location of flight recorders under water; and

(5) Require a means to correlate the time of recorded data with the time of radio communications between the airplane and air traffic control.

Amendment 121-70

Issued on October 29, 1970

Subject: Leasing of Aircraft by Certificate Holders

The purpose of this amendment was to require certificate holders certificated under Part 121 to provide the Administrator with copies of wet lease agreements made with other persons operating large airplanes. In addition, it provides for amending the operations specifications to require an indication of those regulations the Administrator determines governs operations conducted under such agreements.

EXHIBIT 2

MAJOR FACILITIES UNDER CONTRACT AND PROCUREMENT INITIATED

	Under Contract	Procurement Initiated
Air Route Surveillance Radar (ARSR)	0	3
Remote Center Air/Ground Channels (RCAG)	-	161
Terminal VOR (TVOR)	6	-
Add TACAN to VOR	157	-
Air Traffic Control Towers	3	54
Airport Surveillance Radar (ASR)	13	23
Instrument Landing Systems CAT I (ILS)	114	-
CAT II	7	29
Approach Light Systems	57	56
Direction Finder Equipment (UHF/VHF DF)	24	-
Control Computer Complex	7	-
Computer Update Equipment (CUE)	14	-
Flight Data Processing	13	-
Visual Approach Slope Indicator (VASI)	40	-
BRITE Displays	-	34
ARTC Center Building Expansion	15	-
ARTS III	33	-

MAJOR FACILITIES INSTALLED OR COMMISSIONED
(Since 20 January 1969)

	Number
Air Route Surveillance Radar (ARSR)	1
Remote Center Air/Ground Facilities (RCAG)	6
Terminal VOR (TVOR)	7
Add TACAN to VOR	19
Air Traffic Control Towers	11
Airport Surveillance Radar (ASR)	3
Instrument Landing System (ILS) CAT I	21
CAT II	5
Approach Light Systems	14
Direction Finder Equipment (UHF/VHF DF)	28
Control Computer Complex	5
Computer Update Equipment (CUE)	6
Flight Data Processing	7
Common Digitizers	82
Visual Approach Slope Indicator (VASI)	13
BRITE Displays	88

FAA FACILITY RELIABILITY

We are continuously working to correct deficiencies which cause outages or the unavailability of services. The impact of an outage depends upon the particular air traffic scenario. Facility outages have a great impact especially on high traffic density areas. Average performance of our major facilities is as follows:

AIRPORT SURVEILLANCE RADAR

The number of commissioned airport surveillance radars, during nine months of CY-1970, was 117. These radars were available for operational use 99.73 percent of the time. The total system experienced an average of 5.1 outages per day. The duration of each outage averaged 1.5 hours. The major causes of outage were scheduled maintenance* and electronic equipment failures.

ENROUTE RADAR

The number of commissioned enroute radar services, during nine months of CY-1970, was 92. These radars were available for operational use 99.07 percent of the time. The total system experienced an average of 9.8 outages per day. The duration of each outage averaged 2.1 hours. The major causes of outage were electronic equipment failure, scheduled maintenance, and microwave link path fade.

SECONDARY RADAR BEACON

The number of commissioned secondary radar beacons, during nine months of CY-1970, was 203. These beacons were available for operational use 99.45 percent of the time. The total system experienced an average of 14.6 outages per day. The duration of each outage averaged 1.8 hours. The major causes of outages were those caused by the associated radar and electronic equipment failures.

LOCALIZER

The number of commissioned localizers, during nine months of CY-1970, was 302. These localizers were available for operational use 97.62 percent of the time. The total system experienced an average of 12.8 outages per day. The duration of each outage averaged 13.3 hours. The major causes of outage were electronic equipment failure and scheduled maintenance.

*Scheduled maintenance is scheduled at a time when the impact upon the user is minimized.

GLIDE SLOPE

The number of commissioned glide slopes, during nine months of CY-1970, was 284. These glide slopes were available for operational use 95.12 percent of the time. The total system experienced an average of 15.5 outages per day. The duration of each outage averaged 27.2 hours. The major causes of outage were those caused by the associated localizer, equipment failure, and scheduled maintenance.

VHF OMNI-DIRECTIONAL RANGE

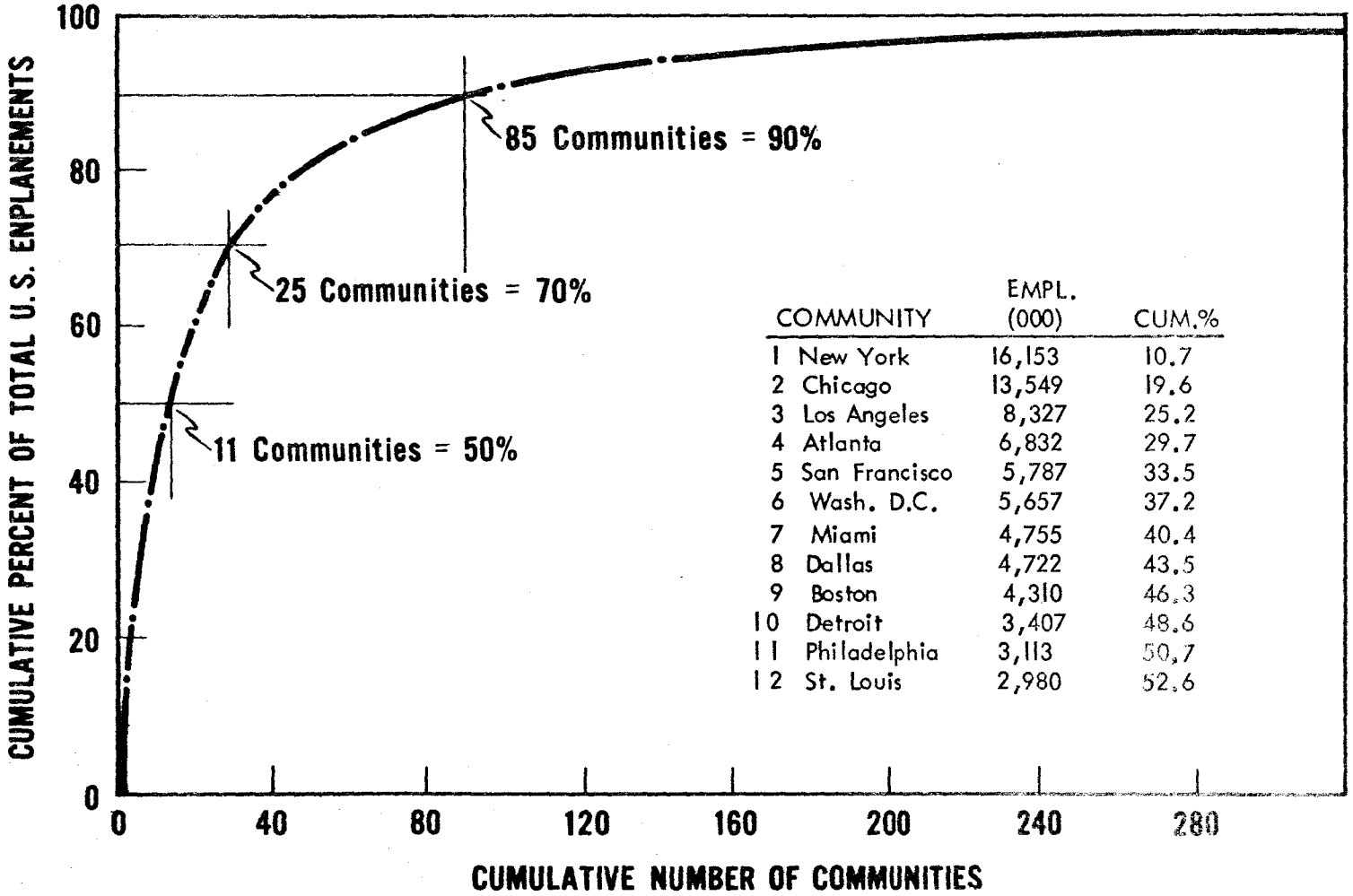
The number of commissioned VHF omni-directional ranges, during nine months of CY-1970, was 893. These omni-directional ranges were available for operational use 99.13 percent of the time. The total system experienced an average of 24.7 outages per day. The duration of each outage averaged 7.5 hours. The major causes of outage were electronic equipment failure, scheduled maintenance, and facility improvements.

TACTICAL AIR NAVIGATION

The number of commissioned tactical air navigation facilities, during nine months of CY-1970, was 570. These facilities were available for operational use 99.33 percent of the time. The total system experienced an average of 21 outages per day. The duration of each outage averaged 4.3 hours. The major causes of outage were electronic equipment failure and scheduled maintenance.

EXHIBIT 4

COMPARISON OF CUMULATIVE DISTRIBUTION OF U.S. PASSENGER ENPLANEMENTS TO NUMBER OF COMMUNITIES SERVED - CY 1968



COMMUNITY	EMPL. (000)	CUM.%
1 New York	16,153	10.7
2 Chicago	13,549	19.6
3 Los Angeles	8,327	25.2
4 Atlanta	6,832	29.7
5 San Francisco	5,787	33.5
6 Wash. D.C.	5,657	37.2
7 Miami	4,755	40.4
8 Dallas	4,722	43.5
9 Boston	4,310	46.3
10 Detroit	3,407	48.6
11 Philadelphia	3,113	50.7
12 St. Louis	2,980	52.6

Source: CAB/DOT Airport Activity Statistics CY 68