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U.S. Federal Aviation Administration Aviation System Indicators Show Drop in Delays and Runway Incursions

The latest figures released by the U.S. Federal Aviation Administration indicate better conditions at airports.

by
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Runway incursions, vehicle/pedestrian deviations (VPDs) and delays are decreasing at U.S. airports, according to the U.S. Federal Aviation Administration (FAA). The FAA's most recent quarterly report on indicators that monitor the safety and efficiency of U.S. aviation also shows that airport facility reliability has increased.

Data for 35 safety, efficiency and environmental indicators were presented in the report, *Aviation System Indicators*, published in November 1993. The indicators reflect the current and past performance of the U.S. aviation system as of Sept. 30, 1993. Indicators will be added and refined as part of an ongoing review of the status of aviation system performance. Data are classified as accident indicators, incident indicators, efficiency measures, compliance measures and inspector activity measures.

Indicators affecting airport operations and safety include data on runway incursions, VPDs, FAA facility/service reliability and aircraft delays.

The report said that except for accident rates, indicators do not individually provide an accurate picture of the safety of the U.S. aviation system.

"Because of the many redundancies designed into the system to ensure a wide margin of safety, a change in one indicator does not by itself represent a change in overall system status. Movement of one indicator, however, can help FAA management and the aviation community focus resources to further investigate underlying factors, and thereby maintain and improve the wide margin of safety that the system is designed to provide," the report said.

Runway incursions result from surface operational errors, surface pilot deviations or VPDs. The runway incursion indicator compares the number of runway incursions that occur at airports to the number of operations at airports.

The runway incursion rate more than doubled per 100,000 airport operations between 1987 and 1990, while the

number of operations increased by 5.8 percent (Table 1). The six-year period (1989-1992) however, ended with a runway incursion rate increase of 66.6 percent, with a 1.9 percent increase in operations over the 1987 figures.

The annual rate increased steadily from 1987 until 1990, then started a downward trend through 1992 (Figure 1).

The monthly rate ranged from a low of 0.16 runway incursions to a high of 0.49 per 100,000 operations for the period October 1991 through September 1993.

Calendar Year	Number of Runway Incursions	Number of Airport Operations	Runway Incursion Rate (per 100,000 airport operations)	
1987	129	61,868,531	0.21	
1988	186	62,501,059	0.30	
1989	223	62,694,772	0.36	
1990	281	65,471,466	0.43	
1991	242	62,387,597	0.39	
1992	219	63,017,350	0.35	
Month			Monthly	12-month Moving Average
OCT 91	21	5,442,349	0.39	0.44
NOV 91	8	4,814,516	0.17	0.40
DEC 91	9	4,554,518	0.20	0.39
JAN 92	17	4,740,273	0.36	0.39
FEB 92	18	4,771,854	0.38	0.39
MAR 92	12	5,259,024	0.23	0.39
APR 92	17	5,420,107	0.31	0.37
MAY 92	27	5,617,456	0.48	0.36
JUN 92	17	5,605,680	0.30	0.34
JUL 92	13	5,747,142	0.23	0.31
AUG 92	24	5,704,326	0.42	0.31
SEP 92	16	5,432,400	0.29	0.32
OCT 92	27	5,559,208	0.49	0.32
NOV 92	18	4,724,484	0.38	0.34
DEC 92	13	4,435,396	0.29	0.35
JAN 93	12	4,501,020	0.27	0.34
FEB 93	13	4,437,801	0.29	0.33
MAR 93	12	5,046,072	0.24	0.34
APR 93	15	5,316,062	0.28	0.33
MAY 93	23	5,466,520	0.42	0.33
JUN 93	24	6,528,074	0.37	0.33
JUL 93	19	6,680,144	0.28	0.34
AUG 93	13	6,668,986	0.19	0.32
SEP 93	10	6,286,107	0.16	0.30

Source: U.S. Federal Aviation Administration, *Aviation System Indicators*

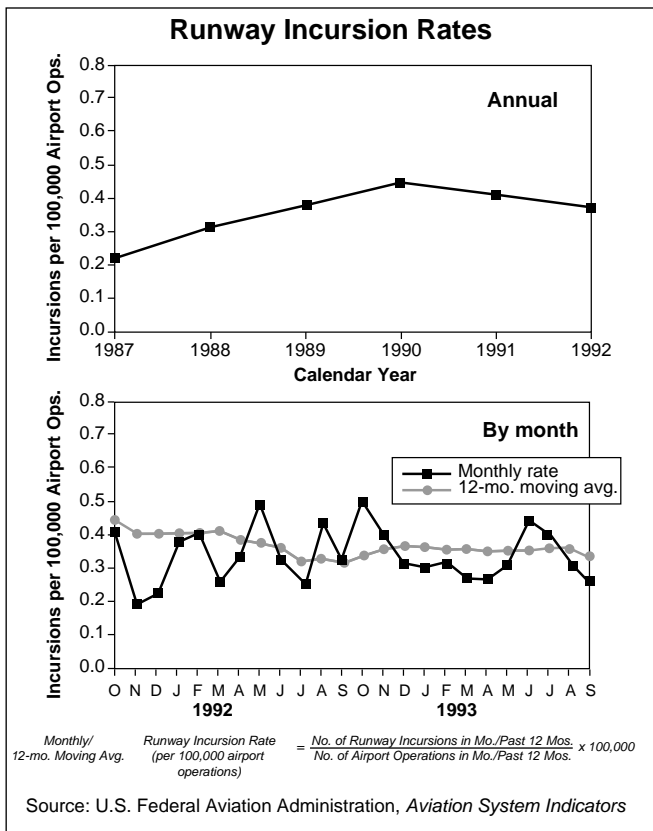


Figure 1

The 12-month moving average for runway incursions per 100,000 operations shows a gradual decline throughout the period.

The monthly and the 12-month moving averages were lowest for the 24-month period in September 1993. The 12-month moving averages show the rate averaged over the preceding 12 months.

The report defined a VPD as an entry or movement on an airport movement area by a vehicle (including an aircraft operated by a non-pilot) or pedestrian that has not been authorized by air traffic control. During the period 1989 through 1992, there was a 41.2 percent drop in the number of VPDs per year (Table 2, page 3).

For the period October 1991 through September 1993, the 12-month moving average dropped from a high of 38 per month at the beginning of the period, to 29 per month by the end of the period. In April and June 1993, the 12-month moving averages were even lower, declining to 28.

The monthly number of VPDs ranged from a low of 14 in December 1991 and March 1993 to a high of 52 in June 1992. The 12-month moving average shows a slight declining trend over the period (Figure 2, page 3).

Table 2 Vehicle/Pedestrian Deviation (VPD) Data		
Calendar Year	Number of Vehicle/Pedestrian Deviations	
1989	621	
1990	598	
1991	423	
1992	365	
Month	Monthly	12-month Moving Average
OCT 91	28	38
NOV 91	26	36
DEC 91	14	35
JAN 92	17	34
FEB 92	30	34
MAR 92	28	34
APR 92	35	34
MAY 92	31	32
JUN 92	52	32
JUL 92	39	31
AUG 92	37	31
SEP 92	25	30
OCT 92	36	31
NOV 92	18	30
DEC 92	17	30
JAN 93	31	32
FEB 93	22	31
MAR 93	14	30
APR 93	17	28
MAY 93	35	29
JUN 93	50	28
JUL 93	42	29
AUG 93	40	29
SEP 93	23	29

Source: U.S. Federal Aviation Administration, *Aviation System Indicators*

The safety and efficiency of airport operations depends on the reliability of FAA air traffic facilities (towers, centers, approach controls) and navigational aids (very high frequency [VHF] omnidirectional radio ranges [VORs], non-directional beacons [NDBs] and instrument landing systems [ILSs]).

Annual reliability of these services improved from 99.58 percent in 1988 to 99.75 percent in 1992. Quarterly reliability reached a high of 99.79 percent in the first quarter of 1992, and ended the third quarter of 1993 at 99.75 percent (Figure 3).

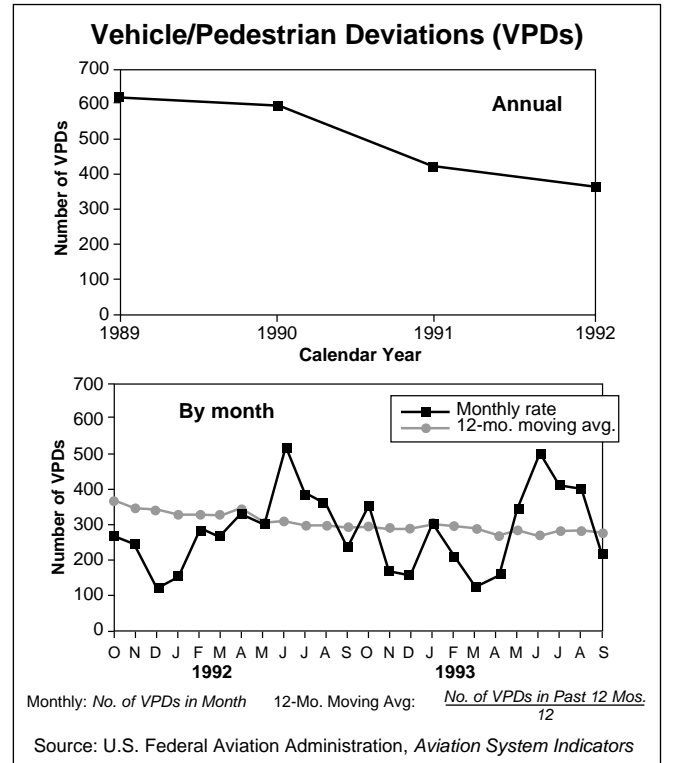


Figure 2

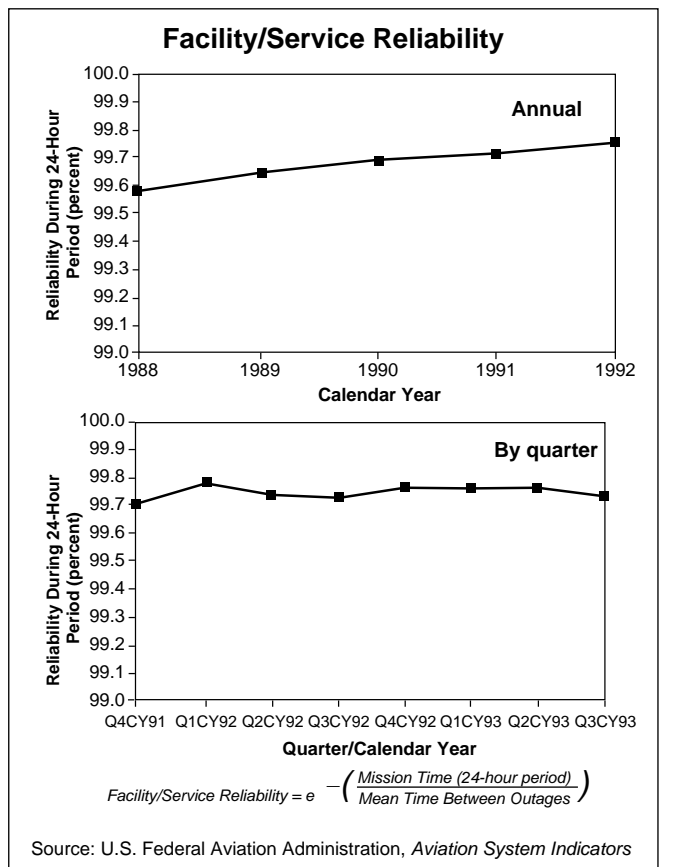


Figure 3

The facility/service reliability indicator provides an estimate of the probability that a typical major facility or service will not fail during mission time (24-hour period). The National Airspace Performance System (NAPRS) sets requirements and procedures for reporting interruptions to facilities and services in the National Airspace System (NAS). According to the report, 104 major facility or service types meet the criteria for interruption reporting. These 104 facility/service types include 13,370 facilities and 7,246 services that comprise the NAS, such as automation facilities and services used to process flight data information, en route and terminal radar facilities and services, and ILSs used by air traffic and the flying public. Facilities (e.g., storage buildings, roads and heating systems) not vital to the control of air traffic nor used by the flying public are not reportable.

Airport operations are also affected by aircraft delays, which result from weather, equipment failures or an excessive volume of traffic.

The delay rate compares the number of delays to total facility activity. The delay rate increased 15.9 percent from 1988 to 1989, while facility activity increased 0.7 percent. By the end of the five-year period 1988 through 1992, the delay rate had decreased 18.7 percent, while facility activities had increased 2.3 percent (Table 3).

From October 1991 through September 1993, the monthly delay rate ranged from a low of 126.9 in October 1992 to a high of 255.3 in March 1993, with corresponding 12-month moving averages of 189.4 and 203.5, respectively.

The annual delay rate per 100,000 facility activities increased from 1988 to 1989, then steadily decreased from 1989 through 1992 (Figure 4, page 5). The 12-month moving average shows a slight overall decline for the period.

The report said that compliance measures included only the Stage 3 aircraft [noise requirement] ratio. An airport certification indicator rate, airport certification system evaluation program and an airworthiness indicator (aging aircraft) are still being developed. Efficiency measures were facility/service reliability, facility/service operational availability, delay rates and rates of delays because of volume.

Environmental indicators provided a context for the system indicators, and included measures such as the forecast of annual enplanements, the forecast of annual instrument flight rules (IFR) traffic handled at en route centers and the number of aircraft hours flown.

The first quarterly report of aviation system indicators was issued in March 1993 and was the result of an FAA

Table 3
Delay Rate Data

Calendar Year	Number of Delays	Number of Facility Activities	Delay Rate (per 100,000 facility activities)	
1988	337,661	140,716,674	240.0	
1989	394,168	141,687,317	278.2	
1990	392,834	146,502,416	268.1	
1991	298,332	141,002,485	211.6	
1992	280,821	144,022,897	195.0	
Month			Monthly	12-month Moving Average
OCT 91	27,096	12,417,171	218.2	218.6
NOV 91	20,916	11,152,882	187.5	219.7
DEC 91	20,767	10,801,115	192.3	211.6
JAN 92	21,020	11,150,138	188.5	202.5
FEB 92	22,473	11,027,945	203.8	202.9
MAR 92	26,721	12,080,708	221.2	204.1
APR 92	19,158	12,236,151	156.6	201.1
MAY 92	18,691	12,474,677	149.8	194.3
JUN 92	25,542	12,517,375	204.1	194.9
JUL 92	30,953	12,913,098	239.7	197.1
AUG 92	28,359	12,804,139	221.5	197.6
SEP 92	22,109	12,244,139	180.6	197.3
OCT 92	15,976	12,593,254	126.9	189.4
NOV 92	22,170	11,142,761	199.0	190.3
DEC 92	27,649	10,838,512	255.1	195.0
JAN 93	27,385	10,921,787	250.7	199.7
FEB 93	22,894	10,582,522	216.3	200.6
MAR 93	30,526	11,956,994	255.3	203.5
APR 93	21,889	12,211,936	179.2	205.4
MAY 93	18,079	12,425,313	145.5	205.0
JUN 93	22,789	12,398,072	183.8	203.3
JUL 93	21,200	14,242,775	148.8	194.7
AUG 93	24,780	14,403,728	172.0	190.1
SEP 93	24,100	13,477,742	178.8	189.8

Source: U.S. Federal Aviation Administration, *Aviation System Indicators*

task force study that developed indicators to reflect the status of the aviation system. The study was prompted by requests from the U.S. Senate Appropriations Committee, U.S. government organizations and the aviation community. The report will be updated quarterly.

Editorial Note: This article was adapted from *Aviation Safety Indicators*, a special report prepared at the request of the U.S. Federal Aviation Administration, Office of Safety Information and Promotion, November 1993. Copies of the 87-page, illustrated report may be obtained by contacting the Associate Administrator for Aviation Safety, Office of Safety Information and Promotion, Federal

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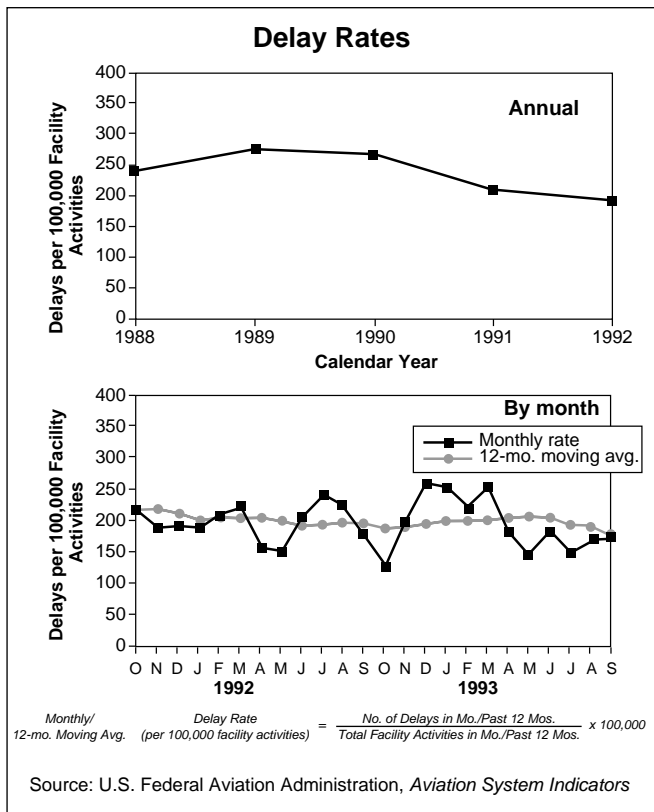


Figure 4

Safe Application of Technologies In Corporate Aviation



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