

June 1990

# AIRLINE SCHEDULING

## Airlines' On-Time Performance



**Resources, Community, and  
Economic Development Division**

B-197119

June 15, 1990

The Honorable Glenn M. Anderson  
Chairman, Subcommittee on Investigations  
and Oversight  
Committee on Public Works and  
Transportation  
House of Representatives

The Honorable William F. Clinger, Jr.  
Ranking Minority Member, Subcommittee  
on Investigations and Oversight  
Committee on Public Works and  
Transportation  
House of Representatives

As requested in your letter of March 2, 1989, and as agreed in subsequent discussions with your offices, we assessed whether (1) airlines had increased scheduled flight time to keep reported delays at a minimum in response to the Department of Transportation's (DOT) on-time performance reporting requirement and (2) DOT verifies that flights omitted from the on-time data because of mechanical problems have in fact experienced mechanical problems. To address these issues, we interviewed DOT, Federal Aviation Administration (FAA), and airline industry officials, and analyzed statistical data maintained by DOT on airlines' on-time performance.

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**Results in Brief**

Airlines have adjusted the amount of time they schedule for flights to develop schedules that are as short as possible yet still allow flights to be on time. However, the airlines' on-time performance, on average, has not improved since the reporting requirement began in September 1987. In addition, while airlines are permitted to exclude flights with mechanical problems from the on-time data, DOT does not verify that these flights experienced mechanical problems. Specifically, we found the following:

- Airlines adjusted scheduled flight time and made other changes to streamline flight operations and improve on-time performance. A flight is considered "on time" if it departs from or arrives at the gate within 15 minutes of its schedule. However, on the basis of the 15-minute criterion, there is no clear trend toward improved on-time performance for

the reporting airlines. Since the reporting requirement began in September 1987, the airlines' average monthly on-time performance has fluctuated, ranging from a low of about 66 percent to a high of about 86 percent. Generally, the percentage of on-time flights declines during the winter months when poor weather interferes with scheduled departures and arrivals. Airline industry and government officials agree that poor weather is the principal reason for late flights. In 1988, about 80 percent of flights arrived on time. In 1989, slightly more than 76 percent of the flights arrived on time.

- DOT monitors the number of flights excluded from the on-time performance data for mechanical problems, but does not verify that these flights had mechanical problems. Flights delayed or canceled because of mechanical problems are not required to be reported to DOT in the on-time data, but the mechanical problems must be reported to FAA. However, FAA does not record the mechanical problem data in a way that allows DOT to cross-check the information. According to DOT's on-time statistics, about 5 percent of all scheduled flights, or an average of over 23,000 flights per month, are excluded from the on-time data because of mechanical problems.

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## Background

DOT's investigation of airline scheduling practices during 1986 and 1987 resulted in the on-time reporting requirement. At that time, DOT found that airlines often scheduled unrealistic flying times because the computerized reservation systems used by travel agents gave priority listings to flights with the shortest elapsed time. Travel agents usually book passengers on one of the flights that appear on the first few display screens of a reservation system. Flights with longer scheduled elapsed times would appear on subsequent screens and agents would be less likely to book these flights. DOT officials concluded that unrealistic scheduling was an unfair and deceptive trade practice. In August 1987, they obtained a commitment from the computerized reservation system vendors to stop listing flights in the order of scheduled elapsed times. This eliminated an incentive for airlines to underestimate flight times.

In September 1987, DOT began recording the on-time performance of U.S. airlines to provide consumers with information on airline flight timeliness. DOT requires the largest U.S. airlines—those having more than 1 percent of total domestic scheduled-service passenger revenues—to report departure and arrival data for each non-stop flight on a monthly

basis.<sup>1</sup> Each flight is identified by airline, flight number, and route (line of travel between the flight's origin and destination). For example, Trans World Airlines' flight 0012 between Boston and Los Angeles, via St. Louis, is counted as 2 separate flight operations, one from Boston to St. Louis and another from St. Louis to Los Angeles (TW/0012/BOS-STL and TW/0012/STL-LAX). DOT's Offices of Economics and Aviation Information Management jointly receive, compile, and monitor the airlines' flight delay data. DOT's Office of Consumer Affairs issues a monthly report, the "Air Travel Consumer Report," showing each airline's performance.

In reporting to DOT, airlines are allowed to exclude flights experiencing mechanical problems from the on-time data to ensure that airlines do not operate unsafe planes for the sake of maintaining a good on-time performance record. Flights canceled for reasons other than mechanical problems, such as poor weather conditions or lack of flight crew, are included and counted as late in calculating on-time statistics. Even though DOT ranks the airlines according to their on-time performance, it has not established a required level of performance.

## Airlines Adjusted Flight Schedules and Operations to Improve On-Time Performance

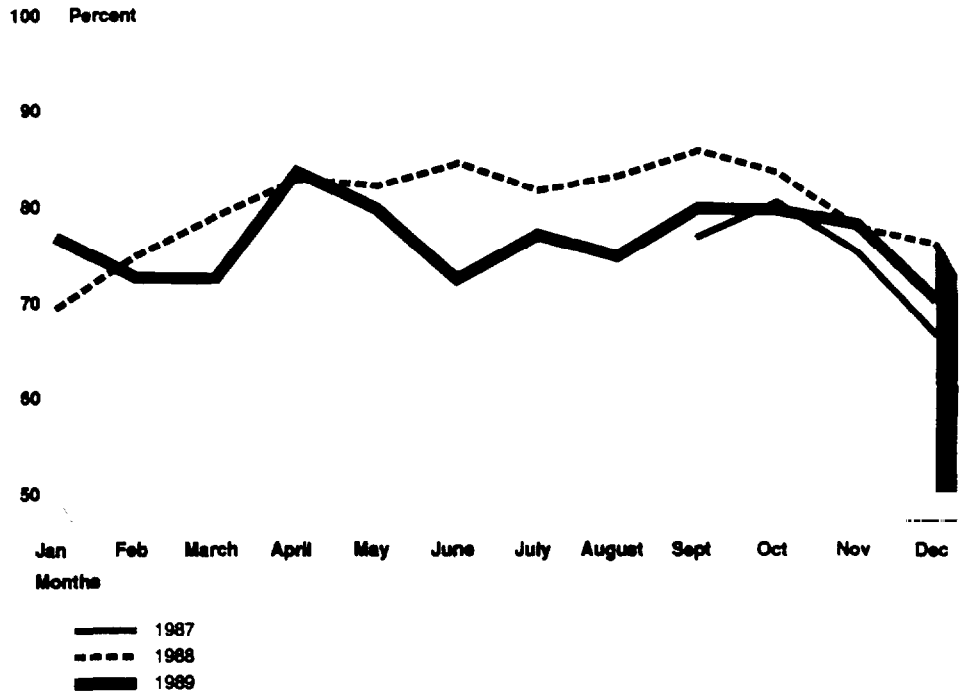
To improve on-time performance, airlines adjusted scheduled time and streamlined flight operations, according to DOT and airline officials. However, the data do not show a trend toward better on-time performance, based on the 15-minute criterion. Airline officials claim that weather and air traffic control system problems are the main reasons why flights are not always on time. Each airline's monthly on-time performance, based on the 15-minute criterion, is provided in appendix I.

## On-Time Performance Fluctuates

The on-time statistics show that airlines' performance has fluctuated from month to month. On-time performance was lowest in December 1987, when 66 percent of flights were on time. The highest performance was achieved in September 1988, when about 86 percent of the flights arrived on time. As shown in figure 1, flights have arrived on time over 70 percent of the time since February 1988, but on-time performance generally was lower in 1989 than in 1988.

<sup>1</sup> These airlines, currently 12, account for about 90 percent of domestic operating revenues. As required by 14 C.F.R. part 234, the airlines must report non-stop flights operating to and from the largest U.S. airports—those with at least 1 percent of total domestic scheduled-service passenger enplanements (currently 29). However, all 12 airlines have voluntarily provided data for their entire domestic systems.

Figure 1: Airlines' On-Time Performance



Source: DOT's Air Travel Consumer Reports.

On-time performance tends to decline during the winter months when poor weather interferes with scheduled departures and arrivals. For example, between November 1987 and March 1988, 66 to 79 percent of the flights arrived on time, while from April 1988 through October 1988, 82 to 86 percent arrived on time. On-time performance then generally declined during the winter months, November 1988 through March 1989, when 72 to 78 percent of the flights arrived on time. In the subsequent months, through October 1989, on-time performance rates were generally higher but did not improve to the levels of the preceding April-October period.

Part of the explanation for the poorer performance can be attributed to factors beyond the airlines' control. For example, in June 1989, unusually heavy rains on the East Coast caused delays at airports in the East that affected traffic throughout the nation. Flights arrived on time only 72 percent of the time during June 1989, compared with 84 percent in June 1988. Also, pilots for one of the nation's largest airlines, United Airlines, decided to slow down flights during the summer of 1989 as

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part of a labor dispute with the airline's management. United's on-time performance for the 1989 summer months (June-August) averaged just over 60 percent, compared with about 81 percent for the summer of 1988. According to DOT, the United pilots' action caused the flights of other airlines to be delayed as well.

Industry and government officials agree that poor weather is the principal reason for late flights. Airline officials also claim that airport congestion is a major cause of flight delays, but DOT and FAA officials, while acknowledging that congestion contributes to some delays, characterized it as a secondary factor.

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## Airlines Have Adjusted Scheduled Flight Times

When on-time performance reporting began, some airlines simply added time to their flight schedules to improve on-time performance. However, increasing the scheduled flight times also increased the airlines' operating costs, since flight crews are paid according to scheduled, not actual, flight time. Also, by increasing the scheduled time for each flight, fewer flights could be scheduled for an aircraft. Therefore, airlines adjusted schedules to be as short as possible yet still allow the flights to arrive on time, according to airline officials. Rather than simply adding more time, some airlines tried to improve on-time performance by shifting frequently late flights to less-congested time slots, streamlining baggage handling, and reducing the time required to fuel and prepare their aircraft.

The airline industry has not set an on-time performance standard, but airline officials told us that public awareness of on-time performance provides incentive to do as well as possible. Airlines with relatively good on-time performance records often publicize their standing in their advertisements. In deciding how much time to allow for a flight, the airlines use past experience and historical trends and schedule different amounts of time for flights covering the same route depending on the time of year and on expected airport congestion. However, DOT and FAA officials noted that airlines schedule their flights assuming the most favorable flying conditions.

DOT's on-time statistics indicate whether flights are completed within the 15-minute criterion, but do not show how late the flight was. Consumers cannot distinguish between flights that are moderately late and those that are severely late. Also, DOT does not assess the data to determine whether the amount of scheduled time has increased over time in an attempt to improve on-time performance. We found that for a sample of

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over 200 non-stop flights during October 1987, 1988, and 1989 airlines added and reduced scheduled time for the same flights. However, we found no relationship between changes in the amount of time allowed to complete a flight and on-time performance, and longer flight times did not always result in better on-time performance.

DOT's Assistant Secretary for Policy and International Affairs recently reviewed the on-time performance data and recommended that more use be made of the performance data. For example, the information could be used to identify unrealistic peak-period flight schedules, congestion patterns at hub airports, and flights that are repeatedly late or canceled. On February 28, 1990, the Secretary of Transportation adopted this recommendation and directed DOT's Offices of Economics and Aviation Information Management to develop computer programs and techniques to further analyze the on-time data. As part of this analysis, DOT plans to assess how late flights are and whether scheduled flight times have increased since the on-time reporting began.

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## **DOT Monitors On-Time Data but Does Not Verify Mechanical Problems**

DOT's Offices of Economics and Aviation Information Management monitor the on-time performance data the airlines submit each month, but do not routinely verify that flights excluded from the on-time data because of mechanical problems were reported to FAA or that these problems actually occurred.<sup>2</sup> DOT's Office of Consumer Affairs and Office of Inspector General have reviewed some flight records to verify that mechanical problems occurred and were documented as required. Results from these surveys show that some flights were not accurately reported and documentation was not always sufficient to support the claim that mechanical problems caused the delay or cancellation. In March 1990, DOT and FAA began to develop procedures that should allow DOT to verify that flights excluded from the on-time data for mechanical reasons were reported to FAA.

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## **DOT Monitors On-Time Data for Errors and Omissions**

DOT checks each airline's monthly on-time report for such things as completeness (scheduled flights are reported as required) and rejects a submission if the error rate is greater than 0.01 percent. If its data are rejected, the airline must correct the data and re-submit its report. After accepting the data, DOT looks for anomalies, such as sudden changes in

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<sup>2</sup>Airlines are required to report mechanical problems to FAA by filing either a Mechanical Reliability Report or a Mechanical Interruption Summary as outlined by 14 C.F.R. 121.703 and 14 C.F.R. 121.705.

the distribution of actual arrival times. For example, if an airline suddenly began reporting a large number of flights arriving 13 to 14 minutes after the scheduled arrival times (on time according to DOT's 15-minute criterion), DOT would investigate to determine whether the airline adjusted actual arrival and departure times to show better performance than was actually achieved. According to DOT officials, to date, the on-time data have not indicated sudden changes in near on-time performance that would require such an investigation.

DOT estimates the number of flights excluded for mechanical problems by comparing the flights completed (as reported in the on-time data) to the flights scheduled to operate (as listed in the Official Airline Guide). Flights scheduled to operate but not reported in the on-time data are assumed to have experienced mechanical problems, according to the DOT officials. On the basis of this assumption, flights excluded from the on-time data because of mechanical problems have averaged over 23,000 flights per month, or about 5 percent of the flights scheduled to operate each month.<sup>3</sup>

While DOT does not routinely verify flights affected by mechanical problems, it has investigated this issue. Beginning in 1988, DOT's Office of Consumer Affairs surveyed flights omitted from the on-time data. DOT officials selected samples of 5 or 6 flights from each of the 12 reporting airlines and traced them back to the airlines' records. They found that about half of the flights had been either incorrectly excluded from the on-time data or were not sufficiently documented to support the claim that a mechanical problem caused the delay or cancellation.

In 1989, the DOT Inspector General (IG) also audited the on-time performance data. The audit objectives were to determine (1) whether data submitted by the airlines are accurate, (2) whether flights not reported due to mechanical problems are appropriately documented, and (3) whether DOT's on-time reporting system provides accurate information. To verify the data, the IG traced a sample of flights for each of the 12 reporting airlines back to the pilots' logs.<sup>4</sup> To assess the accuracy of DOT's reporting system, the IG reviewed DOT's computer programs and edit procedures and processed sample data to test the system.

<sup>3</sup>Overall, the percentage of flights omitted each month from the on-time data has fluctuated, ranging from about 4 percent to over 7 percent. Individual airline rates of mechanical exclusions show similar month-to-month variations.

<sup>4</sup>The IG reviewed March 1989 flight data for all airlines except Eastern Air Lines. August 1989 data were used for Eastern, since its flights were reduced significantly in March and the immediate subsequent months because of the strike by the Eastern machinists and pilots.



The IG's draft report states that DOT's reporting system provides accurate on-time performance information for the flight data the airlines report to DOT. Regarding the accuracy of the airlines' data submissions, the IG reported that the airlines accurately reported arrival and departure times. However, the IG found that of 3,903 flights excluded by the airlines from the on-time data because of mechanical problems, 564 should have been reported and included in the on-time data.<sup>7</sup> The IG estimated that if these flights had been included, 11 airlines' on-time performance would have been slightly less—by 0.1 to 1.9 percent—than reported.

## DOT Has Not Verified Mechanical Problems

Flights delayed or canceled for mechanical problems average about 23,000 each month, or about 5 percent of all flights scheduled to operate. Airlines are not required to report these flights in the on-time data submitted to DOT, but they must report the mechanical problems to FAA. However, DOT cannot readily verify that the flights were reported to FAA because FAA does not record the data on mechanical problems in a way that allows DOT to cross-check the information. Specifically, FAA does not require airlines to include flight numbers when they report mechanical problems. DOT needs these numbers to verify that the flights were scheduled to operate but were not reported in the on-time data. Furthermore, FAA does not enter the reports on mechanical problems into a consolidated computer data base that would streamline the verification process. Because of the volume of flights affected by mechanical problems, manual cross-checking would require significant amounts of time and resources.

In January 1990, DOT's Assistant Secretary for Policy and International Affairs recommended to the Secretary of DOT that FAA's reporting system be revised so that flights excluded from DOT's on-time data because of mechanical problems could be verified. According to DOT, FAA began to computerize the maintenance records on mechanical problems more than 2 years ago but stopped because of budget constraints. The Secretary of Transportation recently adopted this recommendation, and FAA and DOT have started to develop procedures for recording and consolidating the data on mechanical problems in a way that would allow DOT to verify the exclusions. According to DOT, it may require a year to develop and implement the revised reporting procedures.

<sup>7</sup>The IG's audit methodology used simple random sampling to select a sample of each airline's flights and 95-percent confidence levels for statistical projections. See appendix III for additional details on the methodology.

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## On-Time Data Include Non-Mechanical Flight Cancellations

Flights canceled for non-mechanical reasons are reported to DOT as late flights in the on-time data. These non-mechanical cancellations average about 4,700 flights, or just over 1 percent of flights each month. Reasons for non-mechanical cancellations are not identified but include adverse weather, lack of crew, and other factors, such as economic cancellations or unexpected runway closures.<sup>4</sup> Information on non-mechanical cancellations for each month is provided in appendix II.

According to DOT and airline officials, most of the non-mechanical cancellations appear to be due to weather conditions since they follow a seasonal pattern. Also, flight cancellations tend to occur in clusters at specific airports on specific dates, which generally correspond to the storm patterns. However, some non-mechanical cancellations may be due to an airline's attempt to use aircraft more efficiently when mechanical problems occur.

As a result of inquiries from consumers, during 1987, officials from DOT's Office of Consumer Affairs conducted several on-site investigations to assess whether non-mechanical flight cancellations occurred for economic reasons. The DOT investigation found that, in some cases, airlines reassigned planes when a mechanical problem occurred so that the fewest number of passengers were inconvenienced. While economic and efficiency factors are involved in such a decision, DOT does not consider these to be economic cancellations. In these cases, flights with relatively few passengers might be canceled so that the aircraft can be used for flights with relatively more passengers whose planes might have experienced a mechanical problem. Many factors are involved, but "inconveniencing the fewest passengers possible" was reported to be the airlines' primary consideration in making the decision. DOT concluded that there was insufficient evidence to demonstrate that airlines had been engaged in a deceptive practice of canceling flights for economic reasons.

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## Conclusions

The purpose of the on-time reporting requirement is to provide consumers with information on airlines' timeliness, but the on-time performance statistics do not indicate how late flights are or provide information on why some flights are canceled. While DOT's reporting system measures whether flights depart and arrive within 15 minutes of their scheduled times, it does not indicate whether actual flight times

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<sup>4</sup>DOT defines economic cancellations as the practice of canceling a flight to save fuel and crew costs when there are only a few passengers booked on the flight.

are closer to or further from scheduled times since the on-time performance reporting began. Furthermore, the on-time statistics do not provide information on changes that airlines may make to scheduled flight times to facilitate on-time performance. In addition, while non-mechanical flight cancellations are included in the on-time data, airlines do not report the reasons for or extent of such cancellations. In its effort to increase the use of the on-time data, DOT plans to assess how late flights are and whether scheduled flight times have increased since the on-time performance reporting requirement began. Including the reasons for non-mechanical flight cancellations could also provide additional consumer information on airlines' performance.

DOT has not been able to readily verify that flights excluded for mechanical problems actually experienced these problems or were reported to FAA. Because of the volume of mechanical problem data and the fact that the data are not recorded in a way that facilitates verification, DOT has not routinely verified this information. The Secretary has directed the Administrator of FAA to implement procedures that will record and consolidate the mechanical problem data in a way that will allow DOT to verify that flights excluded from the on-time data were reported to FAA. These changes should provide the information DOT needs to monitor the cause of delays.

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## Recommendation to the Secretary of Transportation

We recommend that the Secretary of Transportation, as part of the effort to increase the usefulness of the on-time data, assess the feasibility of requiring airlines to report the reasons for non-mechanical cancellations. Airlines currently report flights canceled for non-mechanical reasons, but would need to include the reasons for such cancellations in their monthly on-time data so that DOT could assess the type and frequency of each reason.

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## Agency Comments

DOT officials provided oral comments on a draft of this report. These officials agreed with our overall conclusions and reiterated that plans are underway to improve and further use the on-time data. They also acknowledged that including the reasons for non-mechanical flight cancellations would provide additional airline performance information. However, they noted that it would be difficult for DOT to verify these reasons, given the time and resources required to do so. To minimize the time and resources needed to verify this information, we suggest that DOT conduct periodic spot checks to verify that the reasons provided by the airlines support the non-mechanical cancellations. If such spot

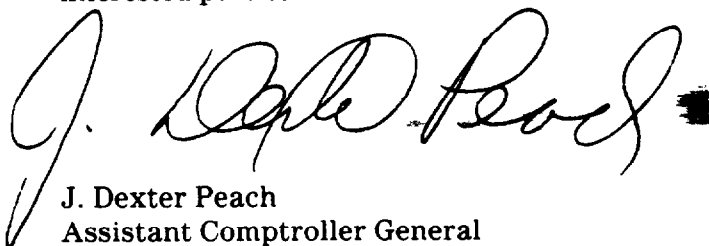
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checks indicate repeated reporting errors, a more extensive verification process would be warranted.

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In conducting our review, we interviewed DOT, FAA, and airline officials and obtained the most recent on-time performance data. We performed our work in accordance with generally accepted government auditing standards under the direction of Kenneth M. Mead, Director of Transportation Issues, who can be reached at (202)275-1000. Appendix III discusses in more detail the scope and methodology we used in compiling this report, and appendix IV lists other major contributors to the report.

We are sending copies of this report to the Secretary of Transportation, the Administrator of the Federal Aviation Administration, and other interested parties.



J. Dexter Peach  
Assistant Comptroller General

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Figure 1: Airlines' On-Time Performance

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## Abbreviations

DOT	Department of Transportation
FAA	Federal Aviation Administration
GAO	General Accounting Office
IG	Office of Inspector General
RCED	Resources, Community, and Economic Development Division



# Percentage of Flights That Met the On-Time Performance Criterion

Month/year	Alaska Air	America West	American	Continental
Sept 1987	79.8	73.4	84.5	81.1
Oct. 1987	75.2	74.9	86.1	84.4
Nov. 1987	75.4	77.1	83.2	74.5
Dec. 1987	59.2	76.4	73.1	60.5
Jan 1988	76.4	83.9	75.7	64.8
Feb 1988	76.9	88.7	80.8	67.7
Mar 1988	75.6	89.9	83.8	71.6
Apr. 1988	77.7	90.8	85.0	81.5
May 1988	81.3	90.9	87.6	80.1
June 1988	82.9	92.8	88.2	86.9
July 1988	86.0	93.9	85.9	83.0
Aug. 1988	83.7	91.5	85.9	86.8
Sept. 1988	86.9	92.9	87.8	86.3
Oct. 1988	77.9	89.1	83.8	81.9
Nov. 1988	74.4	79.2	78.2	77.1
Dec. 1988	68.2	76.4	75.6	75.7
Jan. 1989	76.0	81.5	77.4	78.6
Feb. 1989	78.2	77.5	65.4	75.2
Mar. 1989	77.4	84.9	70.4	78.1
Apr 1989	87.5	92.8	85.9	85.3
May 1989	87.0	91.7	81.7	80.4
June 1989	80.4	90.8	76.2	72.5
July 1989	82.2	89.4	83.8	80.0
Aug. 1989	75.8	87.0	83.6	79.3
Sept 1989	83.7	86.7	84.6	83.6
Oct. 1989	79.8	77.1	85.8	83.4
Nov. 1989	80.1	76.9	85.5	79.9
Dec. 1989	69.7	72.9	74.1	71.6

**Appendix I  
Percentage of Flights That Met the On-Time  
Performance Criterion**

<b>Delta</b>	<b>Eastern</b>	<b>Northwest</b>	<b>Pacific Southwest</b>	<b>Pan Am</b>	<b>Piedmont</b>	<b>Southwest</b>	<b>TWA</b>	<b>United</b>	<b>USAir</b>	<b>Average</b>
72.3	80.4	69.0	70.5	74.3	80.3	82.4	78.4	79.2	67.4	76.6
77.5	83.0	76.5	60.3	79.2	83.2	85.2	79.4	80.7	77.3	80.3
70.1	76.6	73.0	73.3	74.6	73.2	82.7	77.5	79.8	73.2	75.1
61.8	69.5	63.3	57.6	77.3	67.2	74.2	63.5	62.6	71.9	66.4
65.6	61.5	61.6	81.6	72.6	62.4	85.0	65.5	69.8	73.2	69.2
73.6	70.6	61.7	90.6	80.1	75.0	88.5	69.4	73.2	74.8	74.7
77.3	75.6	75.2	92.3	78.8	78.7	86.3	74.4	78.4	78.5	78.8
85.6	75.5	84.2	91.1	76.5	81.0	90.3	81.5	81.8	77.9	82.6
87.4	76.2	83.9	<sup>a</sup>	68.8	77.5	92.5	81.6	80.5	70.7	81.9
87.6	82.8	84.4	<sup>a</sup>	72.2	83.4	90.8	79.0	81.1	76.6	84.3
86.1	77.1	79.2	<sup>a</sup>	68.8	74.2	91.5	76.6	80.9	74.4	81.5
86.9	80.8	78.4	<sup>a</sup>	74.3	81.9	90.5	78.6	81.0	75.0	83.0
88.0	90.5	75.8	<sup>a</sup>	83.2	85.3	89.3	81.9	84.0	83.7	85.6
87.8	90.3	80.7	<sup>a</sup>	81.1	84.3	82.8	81.5	79.7	79.7	83.4
79.8	85.3	73.8	<sup>a</sup>	77.8	77.5	77.0	79.0	73.8	76.6	77.7
79.3	88.1	77.4	<sup>a</sup>	75.1	71.6	79.6	73.9	69.0	76.6	76.1
77.1	82.6	78.8	<sup>a</sup>	76.3	74.3	77.0	72.1	69.2	79.2	76.7
73.4	80.5	80.4	<sup>a</sup>	73.7	68.8	71.0	71.7	65.6	76.0	72.4
76.7	<sup>b</sup>	82.1	<sup>a</sup>	69.1	56.1	75.3	66.8	66.4	73.0	72.3
84.2	92.9	89.7	<sup>a</sup>	70.9	70.7	84.2	80.8	80.2	85.6	83.4
81.7	87.2	83.6	<sup>a</sup>	69.6	71.0	77.9	79.0	73.9	79.4	79.5
72.0	80.1	75.1	<sup>a</sup>	64.4	62.8	75.8	78.6	63.0	69.4	72.2
79.1	86.4	77.6	<sup>a</sup>	73.9	67.6	85.4	79.8	62.3	72.2	76.9
79.0	86.9	74.6	<sup>a</sup>	75.9	65.7	84.6	78.3	60.1	62.6	74.6
82.7	80.6	74.6	<sup>a</sup>	77.7	<sup>c</sup>	86.9	82.2	76.1	71.7	79.6
83.8	83.9	77.3	<sup>a</sup>	76.8	<sup>c</sup>	82.6	82.4	76.9	70.3	79.5
80.1	81.3	76.7	<sup>a</sup>	76.9	<sup>c</sup>	81.4	81.8	78.1	68.4	78.0
71.4	69.1	76.7	<sup>a</sup>	73.5	<sup>c</sup>	81.6	67.8	70.7	59.4	70.2

Note: A flight is considered on time if it departs from or arrives at the gate within 15 minutes of its scheduled time. Airlines are required to report on-time performance data for non-stop flights from the largest U.S. airports (currently 29). In addition, the airlines have chosen to report this data for their entire domestic systems and that information is included in this table.

<sup>a</sup>Not available; Pacific Southwest merged with USAir.

<sup>b</sup>Eastern did not report usable data because its strike interrupted flight operations. Subsequent months reflect reduced operations.

<sup>c</sup>Not available; Piedmont merged with USAir.



# Flights Canceled for Non-Mechanical Reasons

Month/year	Total flights performed	Flights canceled	
		Number	Percent
Sept 1987	427,570	3,864	0.9
Oct. 1987	448,620	3,001	0.7
Nov 1987	422,803	5,191	1.2
Dec. 1987	440,403	11,493	2.6
Jan 1988	436,950	15,755	3.6
Feb 1988	412,579	7,323	1.8
March 1988	445,080	3,123	0.7
April 1988	427,325	2,414	0.6
May 1988	435,916	2,627	0.6
June 1988	431,299	1,203	0.3
July 1988	441,118	2,750	0.6
Aug. 1988	446,769	2,478	0.6
Sept. 1988	424,075	2,038	0.5
Oct 1988	441,670	2,306	0.5
Nov. 1988	420,861	3,517	0.8
Dec. 1988	438,454	4,629	1.1
Jan. 1989	440,022	7,040	1.6
Feb. 1989	395,176	8,106	2.1
March 1989	414,833	7,035	1.7
April 1989	405,604	2,086	0.5
May 1989	416,160	2,523	0.6
June 1989	406,293	3,722	0.9
July 1989	417,166	2,953	0.7
Aug. 1989	426,085	2,692	0.6
Sept. 1989	415,068	5,195	1.3
Oct. 1989	437,134	4,211	1.0
Nov. 1989	417,821	3,497	0.8
Dec. 1989	429,490	9,282	2.2
<b>Total</b>	<b>11,962,344</b>	<b>132,054</b>	
Monthly average	427,227	4,716	1.1

Note: Flights canceled for non-mechanical reasons are reported as part of the on-time data, counted as late, but also identified as canceled flights.

# Objectives, Scope, and Methodology

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On March 2, 1989, the Chairman of the Subcommittee on Investigations and Oversight, House Committee on Public Works and Transportation, and the Ranking Minority Member of the Subcommittee requested that we review the Department of Transportation's (DOT) Office of Consumer Affairs. Specifically, the requesters asked us to focus on the data DOT maintains on airlines' on-time performance. To respond to the requesters' concerns, we obtained information on airlines' scheduling practices, on-time performance statistics, and flights affected by mechanical and non-mechanical problems.

To respond to these concerns, we interviewed officials in DOT's Office of Consumer Affairs, Office of General Counsel, Office of Economics, Office of Aviation Information Management, Federal Aviation Administration, and Office of Inspector General. We also obtained the most recent statistics maintained by DOT on airlines' on-time performance and consumer complaints regarding airline service.

We discussed flight schedule changes and adjustments airlines made to reduce delays and improve their on-time performance with officials from American, America West, Delta, Eastern, United, and USAir airlines. We also evaluated a sample of 216 nonstop flights to assess whether changes had been made to the time scheduled for each flight. We selected eight flights from each of the 27 largest airports for which on-time performance data were reported during October of 1987, 1988, and 1989. For each airport, we identified two routes with a large number and frequency of flights. Then, we selected four flights for each of the two routes, which were operated by at least two airlines and scheduled at various times throughout the day. For these flights, we compared the scheduled flight time and on-time performance data reported for October 1987, 1988, and 1989.

We interviewed officials from DOT's Office of Inspector General (IG) to obtain information on their audit of the data on airlines' flight delays. The overall objective of the IG audit was to determine the accuracy of flight delay data reported to DOT and the effectiveness of DOT's system in controlling the reported data and producing the on-time performance information. The IG's audit assessed the accuracy of the on-time flight data submitted to DOT and whether the flights excluded from the on-time data because of mechanical problems were appropriately documented. The audit included statistical sampling (simple random sampling) to select a sample of the reported flight data and a separate sample of the excluded flights. The IG's sampling methodology provided audit results used for statistical projections at the 95-percent confidence level.

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**Appendix III**  
**Objectives, Scope, and Methodology**

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Our review was conducted between July and December 1989 in accordance with generally accepted government auditing standards.

# Major Contributors to This Report

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Resources,  
Community, and  
Economic  
Development Division,  
Washington, D.C.

James Noel, Assistant Director  
Francis P. Mulvey, Assistant Director  
Nancy E. Oquist, Evaluator-in-Charge  
John C. Johnson, Evaluator



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