



# Aviation Investigation Final Report

<b>Location:</b>	WASHINGTON, District of Columbia	<b>Incident Number:</b>	IAD96IA044
<b>Date &amp; Time:</b>	February 20, 1996, 15:12 Local	<b>Registration:</b>	N33202
<b>Aircraft:</b>	Boeing 737-130	<b>Aircraft Damage:</b>	Minor
<b>Defining Event:</b>		<b>Injuries:</b>	79 None
<b>Flight Conducted Under:</b>	Part 121: Air carrier - Scheduled		

## Analysis

The pilots reported that as they neared the destination airport, ATC requested that they keep their airspeed up during the approach. The pilots obtained the current ATIS information, which noted an 'overriding tailwind component' on final approach for runway 36. The surface winds were reported to be from 040 degrees at 7 knots. The captain indicated that he began to slow the airplane for landing during the descent, about 11 miles south of the airport. ATC personnel in the tower indicated that the airplane was fast on the approach, and it touched down slightly farther down the runway than other airplanes that landed that day. They also indicated that the thrust reversers deployed farther down the runway than usual. FDR data indicated that the airplane touched down at about 180 knots indicated airspeed. The FDR data also showed that during the previous landing (made by another aircrew), the airplane touched down at about 140 knots. Subsequently, the airplane ran off the departure end of the runway and stopped about 250 feet onto the overrun area where it encountered mud. Postaccident examination revealed that the two inboard main landing gear tires had blown out during the landing. During a test of the anti-skid system, the channel for the inboard brakes did not function properly.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: excessive airspeed was maintained by the captain during the approach/landing phase of the flight, which resulted in an overrun and an encounter with soft/wet terrain. Factors relating to the incident were: the pilot's failure to attain the proper touchdown point, the wet runway condition, and partial failure of the anti-skid brake system.

## Findings

Occurrence #1: OVERRUN

Phase of Operation: LANDING

### Findings

1. (C) AIRSPEED - EXCESSIVE - PILOT IN COMMAND
2. (F) PROPER TOUCHDOWN POINT - NOT ATTAINED - PILOT IN COMMAND
3. (F) AIRPORT FACILITIES, RUNWAY/LANDING AREA CONDITION - WET
4. (F) LANDING GEAR, ANTI-SKID BRAKE SYSTEM - FAILURE, PARTIAL

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Occurrence #2: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER

Phase of Operation: LANDING

### Findings

5. TERRAIN CONDITION - SOFT
6. TERRAIN CONDITION - WET

## Factual Information

### HISTORY OF FLIGHT

On February 20, 1996, at 1512 eastern standard time, a Boeing 737-130, N33202, registered to and operated by Continental Airlines as Flight 1156, on a Title 14 CFR Part 121 scheduled domestic flight, ran off the departure end of runway 36 and onto the overrun area after landing at Washington National Airport (DCA,) Washington, D.C. The 74 passengers and 5 crewmembers onboard the airplane reported no injuries. The airplane sustained minor damage. Instrument meteorological conditions prevailed and a instrument flight rules (IFR) flight plan was filed. The flight departed from Greensboro/Piedmont Triad International Airport, Greensboro, North Carolina at 1432 eastern standard time.

The airplane, a Boeing 737-130, originally departed from Tampa International Airport, Tampa, Florida with a stopover at Greensboro/Piedmont Triad International Airport, Greensboro, North Carolina. The flightcrew from the Tampa to Greensboro flight indicated that they experienced not anomalies during that flight. The pilots for the flight from Greensboro to Washington, D.C. boarded the airplane at Greensboro, and indicated that the en route portion of the flight proceeded normally.

The pilots reported that during their arrival to the destination airport, the approach controller advised them that they were number one for the runway, and requested that they keep their airspeed up during the approach. The flightcrew obtained the current Washington National Airport Terminal Information System (ATIS,) designated "Delta," which noted an "overriding tailwind component" on final approach for runway 36. According to the captain's written statement, the weather was actually better than described by the ATIS, and the surface winds were out of 040 degrees at 7 knots.

The captain stated that he proceeded to the runway visually, and used the Instrument Landing System (ILS) approach as a back up. He reported that, when the airplane was about 11 miles south of the airport, descending on the approach, he began to slow the airplane to approach and landing airspeeds. Air traffic control (ATC) personnel cleared the flight to land on runway 36. The local (DCA tower) controller reported that the airplane touched down in a three point (flat) attitude at approximately the Foxtrot intersection. The controller indicated that he observed the airplane's thrust reversers deploy in the vicinity of the intersection of runway 36 and taxiway November. (An airport diagram is appended.) The controller stated that at this point he realized that the airplane was not going to remain on the runway. The airplane continued off the departure end of runway 36, and came to a stop approximately 250 feet into the overrun area.

### PERSONNEL INFORMATION

The captain held an Airline Transport Pilot's Certificate with over 11,000 total flight hours and a type rating in the B-737. He held a current first class medical, issued January 8, 1996, with no restrictions or limitations noted. The captain's flight time in the incident make and model airplane was reported as follows: 2,294 hours total; 138 hours in last 90 days; 58 hours in the last 30 days; and 1 hour in the last 24 hours.

The first officer held an Airline Transport Pilot's Certificate with 8700 total flight hours and no type rating for the B-737. He held a current first class medical, issued December 13, 1995, with no restrictions or limitations noted. The first officer's flight time in the incident make and model airplane was reported as follows: 5,500 hours total; 211 hours in the last 90 days; 59 hours in the last 30 days; 1 hour in the last 24 hours.

In accordance with Continental Airlines' policy and Federal regulations, both pilots were given a breath alcohol test after the incident. The test results were negative. Breath alcohol test results are appended.

#### AIRCRAFT INFORMATION

The Boeing 737-130, N33202, was in a continuous airworthiness maintenance program, with the most recent inspection performed on February 15, 1996. Records indicated that the airplane had flown 38 hours since the most recent inspection, and the airframe had accumulated a total of 66,654 total flight hours. No pertinent anomalies were noted in the aircraft maintenance logbooks.

The airplane's certificated maximum gross weight is 109,000 pounds. According to the captain's statement, the airplane weighed less than 94,000 pounds at the time of the approach, so 94,000 pounds approach airspeed settings were used. He stated that the landing flap setting was 25 degrees instead of 30 due to the 90,000 pounds weight limit to meet FAR 36 noise abatement sound levels.

After the incident, the captain filled out an irregularity report which stated that during the landing roll, he was unable to stop the aircraft on the runway. He indicated that during the postflight inspection, he observed that the two inboard main landing gear tires were deflated. The captain filled out a maintenance sheet with the same statement.

After the incident, a maintenance group was sent to assess the damage sustained by the airplane. They reported that they found the number 2 and number 3 main landing gear tires were blown and there was minor foreign object damage to both engines. The anti skid system was tested in accordance with the airplane maintenance manual, and no defects were noted. Subsequent work performed on the anti skid systems revealed one discrepancy. According to the Federal Aviation Administration (FAA,) during a test of the anti skid system, one channel on the master control box failed to test correctly. This was the channel that controlled the inboard brakes. Continental Airlines reported that this discrepancy was worked on at the

request of their Maintenance Control, for precautionary reasons only.

## METEOROLOGICAL INFORMATION

The weather reported at Washington National at 1450 eastern standard time was: scattered clouds at 400 feet; a measured ceiling of 700 feet broken; 2400 overcast; visibility, 3 miles with light rain and fog; temperature, 49 degrees Fahrenheit (F); dewpoint, 49 degrees F; and winds out of 040 degrees magnetic at 7 knots; altimeter setting, 30.06 inches of Hg.

The pilot in command, who was flying the airplane, stated that "the weather was better than reported". The ATIS reported an "overriding tailwind component" on final approach for runway 36.

## COMMUNICATIONS

The voice communications between the flightcrew and the approach/local controllers during the final miles into the airport were reviewed. During the approach sequence, neither pilot indicated that their approach airspeed concerned them, nor did they request a reduction of airspeed.

The approach radar controller described the traffic at the time of the incident as light, and not complex. He stated that the incident airplane was identified on radar when it was thirty-five miles south-southwest, and was number one for the approach to runway 36. The approach controller transferred the flight to the local (tower) controller when it was about ten miles south of the destination airport. The approach controller stated that he did not specifically note the approach speed of the incident airplane, however, he did not request the pilots to reduce their airspeed as the airplane proceeded inbound. The approach controller indicated that he did not notice anything unusual about the incident airplane's approach.

The ATC Shift Supervisor, who was in the tower control cab during the time of the incident, stated that he noticed that the incident airplane was established on final approach at an airspeed of 240 knots. The controllers reported that airplanes typically entered final approach at airspeeds between 170 and 210 knots. The supervisor indicated that he observed the airplane, with the data tag, on the DBRITE radar screen located in the tower cab. He further stated that the airspeed appeared higher than the other aircraft approaching to land at the time of the incident.

The local controller stated that he noticed the incident airplane touchdown abeam taxiway Foxtrot, and he indicated that the airplane appeared to be coming in "hot" during the approach and landing. He further stated that he observed the incident airplane's thrust reversers deploy near the intersection of runway 36 and taxiway November. The ground controller concurred with the local controller's observations, and added that the incident airplane touched down further down the runway than other airplanes that arrived at DCA around the time of the incident.

## AIRPORT INFORMATION

Washington National Airport's (DCA) runway 36 is grooved asphalt, 6869 feet long and 150 feet wide. The runway has Centerline Lighting and High Intensity Runway Lights. The distance remaining to the end of the runway for runway 36 from taxiways Foxtrot and November are 4500 feet and 2150 feet respectively.

The approach radar utilized at Washington National Airport last showed the airplane at 400 feet mean sea level, approximately a mile south of the runway threshold and with a ground speed of 250 knots.

Shortly after the airplane over ran the runway, a ground vehicle friction reading was taken for runway 36/18 using a Tapley Meter. The reading for the three zones, Touchdown zone, Rollout zone and the Departure zone, which correspond to the south end, the mid-field, and the north end of the runway, all indicated excellent braking action.

## FLIGHT RECORDERS

The Cockpit Voice Recorder (CVR) and the Digital Flight Data Recorder (DFDR) were removed from the airplane and sent to the National Transportation Safety Board's Vehicle Performance Laboratory for readout and evaluation. Electrical power to the CVR was not disconnected after the incident, allowing the CVR to continue to record. All voice recordings from the inbound portion of the incident flight were recorded over and no useful data was retrieved from the CVR. A successful readout was performed on the DFDR. The data retrieved from the DFDR indicated that the airplane touched down at approximately 180 knots indicated airspeed. To verify the validity of the data in the DFDR, the NTSB technician retrieved the data for the flight from Tampa International Airport to Greensboro Airport. The data retrieved from that flight showed that the airplane approached and touched down at approximately 140 knots. Both the CVR and DFDR were returned to Continental Airlines maintenance department located at Washington National Airport on February 21, 1996.

## Pilot Information

<b>Certificate:</b>	Airline transport; Commercial; Military	<b>Age:</b>	43,Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 1 Valid Medical--no waivers/lim.	<b>Last FAA Medical Exam:</b>	January 8, 1996
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	11234 hours (Total, all aircraft), 2294 hours (Total, this make and model), 6778 hours (Pilot In Command, all aircraft), 138 hours (Last 90 days, all aircraft), 58 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Boeing	<b>Registration:</b>	N33202
<b>Model/Series:</b>	737-130 737-130	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Transport	<b>Serial Number:</b>	19019
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	95
<b>Date/Type of Last Inspection:</b>	February 15, 1995 Continuous airworthiness	<b>Certified Max Gross Wt.:</b>	109000 lbs
<b>Time Since Last Inspection:</b>	38 Hrs	<b>Engines:</b>	2 Turbo fan
<b>Airframe Total Time:</b>	1118 Hrs	<b>Engine Manufacturer:</b>	P&W
<b>ELT:</b>		<b>Engine Model/Series:</b>	JT8D-7
<b>Registered Owner:</b>	CONTINENTAL AIRLINES	<b>Rated Power:</b>	14000 Lbs thrust
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	Flag carrier (121)
<b>Operator Does Business As:</b>	CONTINENTAL AIRLINES	<b>Operator Designator Code:</b>	CALA

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Instrument (IMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>		<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>		<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>	Scattered / 400 ft AGL	<b>Visibility</b>	3 miles
<b>Lowest Ceiling:</b>	Broken / 700 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	7 knots / None	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	40°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30 inches Hg	<b>Temperature/Dew Point:</b>	9°C
<b>Precipitation and Obscuration:</b>	N/A - None - Fog		
<b>Departure Point:</b>	GREENSBORO (GSO)	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	(DCA)	<b>Type of Clearance:</b>	IFR
<b>Departure Time:</b>	14:32 Local	<b>Type of Airspace:</b>	Class D

## Airport Information

<b>Airport:</b>	WASHINGTON NATIONAL DCA	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	16 ft msl	<b>Runway Surface Condition:</b>	Wet
<b>Runway Used:</b>	36	<b>IFR Approach:</b>	ILS;Visual
<b>Runway Length/Width:</b>	6869 ft / 150 ft	<b>VFR Approach/Landing:</b>	None

## Wreckage and Impact Information

<b>Crew Injuries:</b>	5 None	<b>Aircraft Damage:</b>	Minor
<b>Passenger Injuries:</b>	74 None	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	79 None	<b>Latitude, Longitude:</b>	38.910202,-77.01902(est)



## Administrative Information

<b>Investigator In Charge (IIC):</b>	Cain, James
<b>Additional Participating Persons:</b>	THOMAS F FEDDON; WASHINGTON , DC LARRY G SMITH; WASHINGTON , DC EUGENE A CARROLL, JR; HOUSTON , TX WILLIAM NOGUES; HOUSTON , TX
<b>Original Publish Date:</b>	January 10, 1997
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=28019">https://data.nts.gov/Docket?ProjectID=28019</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).