National Transportation Safety Board
Aviation Accident Final Report

Location:	Angel Fire, New Mexico	**Accident Number:**	WPR20FA008
Date & Time:	October 20, 2019, 08:45 Local	**Registration:**	N7742P
Aircraft:	Piper PA 24	**Aircraft Damage:**	Substantial
Defining Event:	Collision during takeoff/land	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot and passenger were departing on a personal flight from the high elevation airport. Friends of the pilot reported that this was his first time flying into the airport and that he wanted to depart to the south and head back toward the airport because of the wind and to gain altitude. An eyewitness who was driving saw the airplane flying from the airport as it appeared to be struggling to remain in flight. The airplane turned to fly over the road and toward the eyewitness, who thought it was preparing to land. As the airplane approached, it pitched up and turned to the west to avoid power lines crossing the road. The airplane impacted trees, a building and terrain, sustaining substantial damage. Several other witnesses saw the airplane as is departed the airport and described the airplane as unstable.

A security camera, located along the road, captured the airplane flying wings level with the landing gear extended, over the road about 50 ft above ground level. As the airplane approached the light poles and power lines, the airplane banked right and traveled behind trees and buildings out of view. It is likely that the pilot was maneuvering the airplane to land on the road.

The calculated density altitude about the time of the accident was 9,360 ft, which would have reduced the airplane's climb performance. Wind was from the west at 9 knots gusting to 21 knots. After the airplane departed the airport to the south toward rising terrain, the airplane turned east over a road, changing the direction of wind to a tailwind, which would have also reduced the airplane’s climb performance by decreasing the airplane’s airspeed. The airplane was also topped with fuel which likely put the airplane near its maximum allowable weight for takeoff. Given these conditions, it is unlikely that the airplane was capable of clearing the rising terrain on the day of the accident.

Postaccident examination of the airframe and engine revealed no anomalies that would have precluded normal operation. In addition, airplane damage signatures, witness accounts, and a video indicated that the engine was producing power at the time of the accident.

Medical evidence showed that the pilot had heart disease, which placed him at increased risk of a sudden impairing or incapacitating cardiac event. However, operational evidence (such as the pilot's maneuvering to avoid obstacles and attempt to navigate to a suitable landing site) is inconsistent with sudden impairment or incapacitation; therefore, it is unlikely that the pilot's heart disease contributed to the accident.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The airplane's degraded performance due to high-density altitude and gusting wind conditions, which resulted in its inability to maintain altitude during the initial takeoff climb. Contributing to the accident was the pilot's lack of experience with high altitude flying and his decision to depart in high-density altitude and gusting wind conditions.

Findings

Personnel issues	Decision making/judgment - Pilot
Environmental issues	High density altitude - Effect on equipment
Aircraft	Climb rate - Attain/maintain not possible
Environmental issues	Gusts - Effect on equipment
Environmental issues	High elevation - Effect on equipment
Personnel issues	Total experience - Pilot

Factual Information

History of Flight

Takeoff	Collision during takeoff/land (Defining event)

On October 20, 2019, about 0845 mountain daylight time, a Piper PA-24, N7742P, was substantially damaged when it was involved in an accident near Angel Fire, New Mexico. The pilot and passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 cross-country flight.

According to friends of the pilot who stated they had helped with the refueling and preflight of the accident airplane that morning, this was his first time flying into Angel Fire Airport (AXX), Angel Fire, New Mexico. The pilot stated to his friends that he was going to depart to the south and then head back toward the airport because of the winds and to gain altitude. The pilot started the engine and let it warm up for about 10-15 minutes. The airplane taxied to the departure end of runway 17 where the pilot performed an engine run-up and magneto checks. The pilot's friends watched as the airplane started its takeoff roll and became airborne a little past halfway down the runway. Shortly thereafter, they saw the airplane's landing gear retract and soon lost sight of the airplane behind the parallel taxiway, which rises in elevation above the runway.

An eyewitness was driving north when she saw the airplane flying south from the airport which was located on the east side of the highway. The airplane was very low and it appeared to be struggling to remain in flight. The airplane turned right to fly over the road and toward the eyewitness, who subsequently drove her vehicle into the ditch alongside the highway. As the airplane was descending, it appeared to the eyewitness that the airplane was preparing to land on the road. The eyewitness noticed a section of power lines that cross the road in front of her location and hoped that the airplane was going avoid hitting them. As the airplane approached the power lines, the airplane pitched up and turned to the west, impacting trees, a building, and the terrain. Several other witnesses saw the airplane as is departed the airport and described the airplane as unstable.

A security camera with a southward view, located at a business between the airport and the accident site, captured the airplane flying overhead about 50 ft above ground level, over the adjacent road. The airplane was flying wings level and the landing gear was extended. As the airplane approached the light poles and power lines in the background, the airplane banked right and traveled behind trees and buildings until it went out of view. Another security camera located near the accident site captured the airplane impacting trees and a building, before cartwheeling to the ground in a nose-down attitude. The airplane's engine was heard producing power in the video. The airplane came to rest in an inverted position and a postaccident fire ensued.

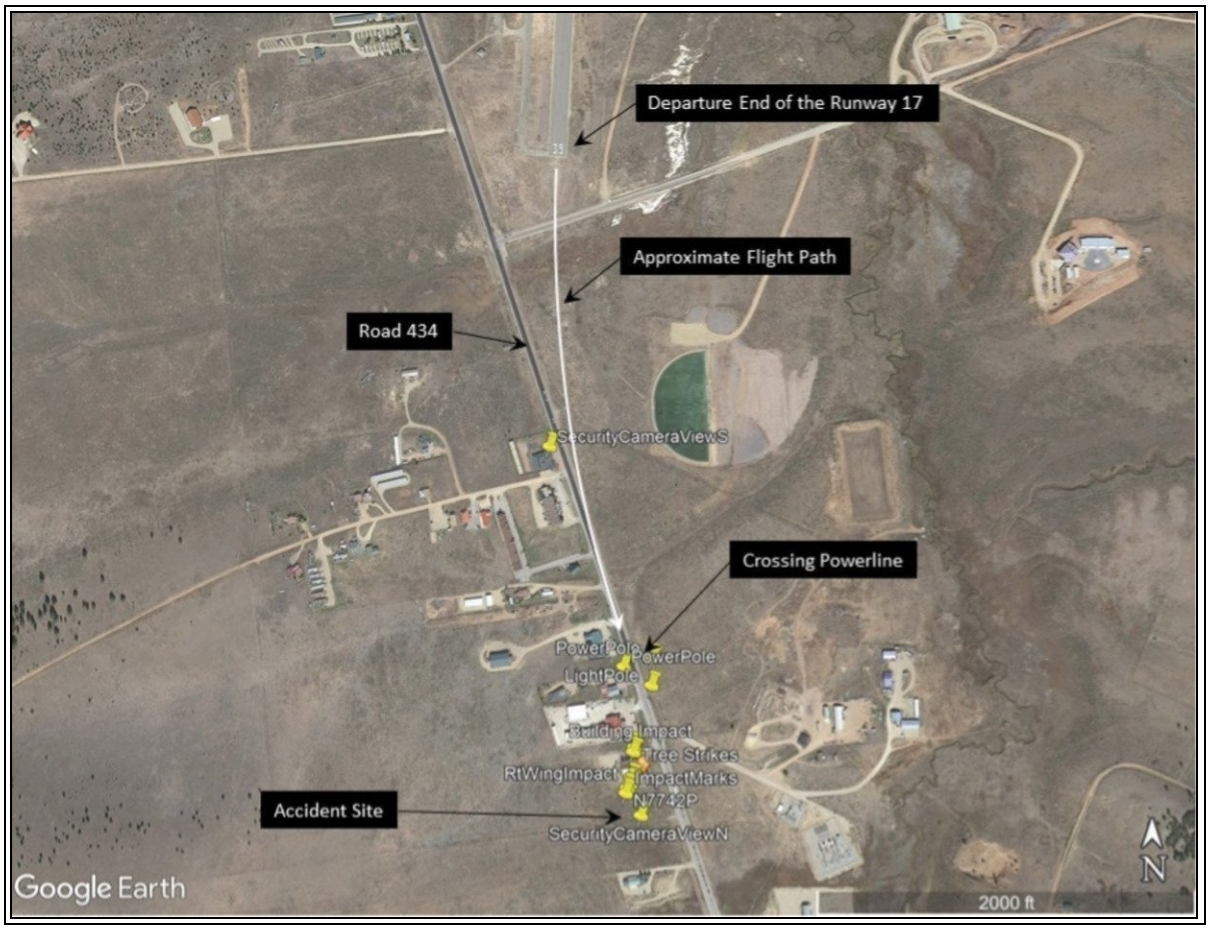

Figure 1-Aerial view of the accident site and approximate flight path.

Pilot Information

Certificate:	Commercial	**Age:**	65,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	March 7, 2019
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1000 hours (Total, all aircraft)		

Passenger Information

Certificate:	**Age:**	Female
Airplane Rating(s):	**Seat Occupied:**	Right
Other Aircraft Rating(s):	**Restraint Used:**	
Instrument Rating(s):	**Second Pilot Present:**	No
Instructor Rating(s):	**Toxicology Performed:**	
Medical Certification:	**Last FAA Medical Exam:**	
Occupational Pilot:	**Last Flight Review or Equivalent:**	
Flight Time:		

The 65-year-old pilot held a commercial pilot certificate with rating for multiengine land, single engine land and instrument airplane. His most recent third-class Federal Aviation Administration (FAA) airman medical certificate was issued on dated March 7, 2019. At that time, he had reported 1,000 total hours of flight experience and 15 flight hours in the last 6 months. The pilot's logbooks were not located during the investigation. There was no evidence found that showed that the pilot had any mountain flying training or experience.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N7742P
Model/Series:	PA 24 Undesignat	**Aircraft Category:**	Airplane
Year of Manufacture:	1961	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	24-2956
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	December 3, 2018 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	3651 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	C91 installed, not activated	**Engine Model/Series:**	O&VO-360 SER
Registered Owner:		**Rated Power:**	
Operator:		**Operating Certificate(s) Held:**	None

The accident airplane, serial number 24-2956, was manufactured in 1961. It was powered by a Lycoming O-360-A1D, reciprocating engine rated at 180-horsepower at 2,700 RPM, serial

number 691467, which drove a Hartzell 2-bladed, constant-speed propeller (part number HC-92ZK-8D), serial number 1110L.

The airplane's two fuel tanks have a total capacity of 60 gallons. According to airport personnel, on the morning of the accident flight, the airplane was refueled with about 20 gallons, which filled both tanks.

Published manufacturer performance data for takeoff distance exists for altitudes from sea level up to 6,000 ft based on standard temperature and pressure. The expected takeoff ground roll could not be determined for the accident takeoff as the environmental conditions exceeded those used in the calculations provided by the manufacturer when the airplane was manufactured. Approximate weight and balance requirements were calculated and were found to be within the normal operating envelope.

According to pilot's operating handbook's crosswind component graph, the airplane would have experienced about a 9 knot crosswind and about a 2 knot tailwind.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KAXX,8380 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	14:45 Local	**Direction from Accident Site:**	355°
Lowest Cloud Condition:	Unknown	**Visibility**	10 miles
Lowest Ceiling:	Overcast / 7000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots / 21 knots	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	270°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	29.87 inches Hg	**Temperature/Dew Point:**	5°C / -13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Angel Fire, NM (AXX)	**Type of Flight Plan Filed:**	None
Destination:	Great Bend, KS (GBD)	**Type of Clearance:**	None
Departure Time:	08:45 Local	**Type of Airspace:**	

At 0845 MDT, AXX reported a wind from 270° at 9 knots with gusts to 21 knots, visibility of 10 statute miles or greater, ceiling overcast at 7,000 ft agl, temperature of 5°C and a dew point temperature of -13°C, altimeter setting of 29.87 inches of mercury; remarks: station with a precipitation discriminator, temperature of 5.3°C and dew point temperature of -13.3°C.

A weather study using the approximate airport elevation, and temperature, dew point temperature and altimeter setting from AXX, density altitude at 0845 at the surface was calculated to be 9,360 ft msl. The automated weather observing system located at AXX, reports

new observations to pilots via very high frequency broadcasts every minute, which will include density altitude if the density altitude is 1,000 ft or more above the highest point of the runway.

An Area Forecast Discussion (AFD) was issued by the Albuquerque National Weather Service Weather Forecast Office at 0525 MDT. Presented here is the "Aviation" section of that AFD.

> *Strong W/NW winds will ramp up through the morning peaking in the afternoon as a Pacific cold front passes through the area from west to east. Gusts of 25-35kts will be common for the northern half of the state…*

Airmen's Meteorological Information (AIRMET) TANGO advisories for moderate turbulence below FL180 and low level wind shear (LLWS) potential were issued at 0245 MDT and were valid for the accident site at the accident time. At 0845 MDT, about the time of the accident, new AIRMET TANGO advisories were issued for moderate turbulence below FL180, strong surface winds and LLWS potential for areas that included the accident site.

Airport Information

Airport:	Angel Fire AXX	**Runway Surface Type:**	Asphalt
Airport Elevation:	8379 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	17	**IFR Approach:**	None
Runway Length/Width:	8900 ft / 100 ft	**VFR Approach/Landing:**	None

AXX was situated at an elevation of 8,379 ft msl. It was equipped with one runway, designated 17/35, which measured 8,900 ft by 100 ft. Runway 17 had an average uphill gradient of .64% and had a difference of about 57 ft between the runway ends. AXX was not equipped with an air traffic control tower. Signage before entering the runway area, caution about the field elevation and to remind pilots of their airplane's performance at that elevation. The airport directory describes the airport as in a mountain valley and has rising terrain in all directions, strong gusty crosswinds possible, and high-density altitude probable.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	36.393054,-105.286941(est)

Examination of the accident site revealed that the first identified point of contact were three trees located on the north side of a building. The main wreckage was found inverted and was the furthest in the debris field. The debris field was about 250 ft long and on a directional heading of about 190° magnetic. Flight control cable continuity was established, and all major structural components were found. The wreckage was relocated, and an engine examination was conducted. There was no evidence of in-flight airframe, engine, or flight control malfunction or failure.

Medical and Pathological Information

The University of New Mexico, Office of the Medical Investigator performed the pilot's autopsy. According to the autopsy report, the cause of death was blunt trauma and the manner of death was an accident.

The autopsy identified moderate-to-severe multivessel coronary artery disease with two coronary artery stents present. There was an area of old heart muscle scarring and microscopic changes consistent with old heart attack. The autopsy, including the remainder of the heart examination, did not identify other significant natural disease.

Two laboratories performed toxicological testing of postmortem specimens from the pilot. One laboratory detected amlodipine, metoprolol, and atorvastatin in heart blood and urine, as well as clopidogrel in urine. The other laboratory did not detect any tested-for substances.

Administrative Information

Investigator In Charge (IIC):	Swick, Andrew		
Additional Participating Persons:	Steve Poiani; FAA-FSDO; Albuquerque, NM Jon Hirsch; Piper Aircraft; Wichita, KS Les Doud; Hartzell Propeller; Piqua, OH Mark Platt; Lycoming Engines; Chandler, AZ		
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Note:			
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=100440		