

Aerial Damage Survey of the Central Texas Tornadoes of May 27, 1997

Brian E. Peters
Warning Coordination Meteorologist
National Weather Service, Birmingham, Alabama

Introduction

During the afternoon of May 27, 1997, severe thunderstorms spawned a series of tornadoes over portions of Central Texas from just south of Waco to west of Austin. As part of the NOAA Service Assessment Team investigating the storm event, an aerial damage survey was conducted. The intent of the aerial survey was to provide information to pinpoint the beginning and ending points of the tornado tracks, as well as provide information on the Fujita Tornado Intensity Scale (F-scale) along the track.

The aerial survey was conducted on Friday and Saturday, May 30-31, using a fixed-wing aircraft flying at approximately 3,000 feet and a helicopter flying between 500 and 1,000 feet. Additional aerial surveying was done on Monday, June 2, using a helicopter arranged by the Travis County Emergency Management Agency and the Fire Marshal's office. A total of about 9 hours of air time was logged in the flights. Some of that air time was spent in getting to and between the various tornado tracks. Additional assistance was obtained by using a Global Positioning System (GPS) and mapping software to accurately plot damage locations. The GPS/software combination claims an accuracy of ± 300 feet.

THE MOODY TORNADO

Maximum F-scale: F3

Path Length = 3.7 miles Path Width = 150 yds

Path Length by County: McLennan [3.2 miles]; Bell [0.5 miles]

Beg: 31° 17.91'/97° 20.16' End: 31° 14.91'/97° 21.48'

The Moody tornado began on the southside Farm to Market Road (FM) 107, 1.6 miles east-southeast of Moody in open country. The tornado traveled south-southwest moving across Dowell Road where two structures, a house and a barn, were destroyed. Another structure, a small house, was damaged just north of this location. A pickup truck and a car were each tossed several hundred feet; the pickup truck to the left of the tornado path and the vehicle along the path. The tornado continued south-southwest from Dowell Road, crossing the McLennan/Bell County line covering open country with trees down in numerous locations.

Maximum F-scale assignment was based upon the damage that occurred at only one location, where the house and barn were destroyed. There was an absence of other structures to make an effective assessment.

THE BELTON TORNADO

Maximum F-scale: F3

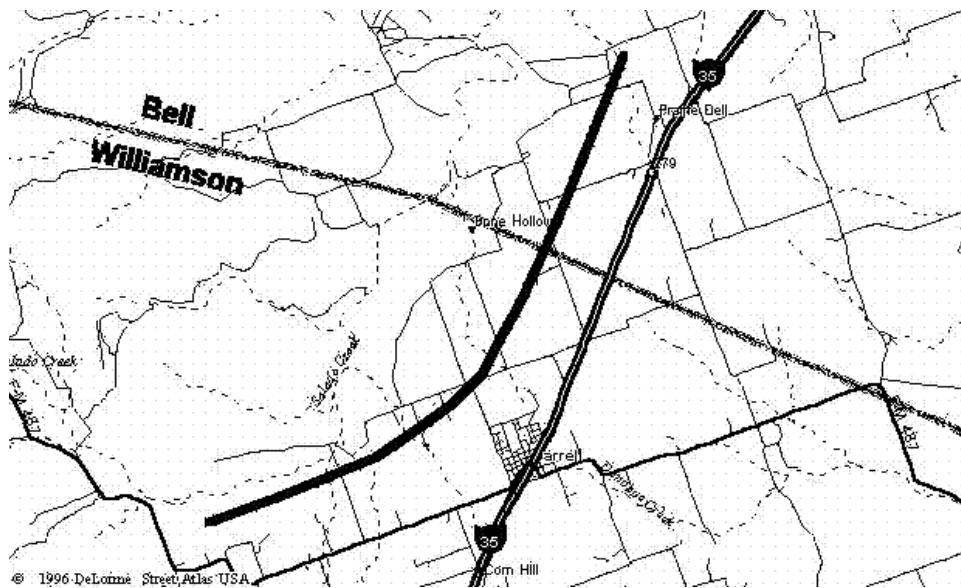
Path Length = 1.4 miles Path Width = 275 yds

County: Bell

Beg: 31° 08.92'/97° 28.29' End: 31° 08.01'/97° 29.19'

The tornado began 6.5 miles north of Belton in an area called Morgan's Point on the northside of Belton Lake. The tornado moved from land along a slough with tree damage on the west side of the slough. A number of structures also on the west side of the slough sustained damage which appeared to be minor. Continuing south-southwest, the tornado crossed a bend in Belton Lake, moving ashore just northeast of a community called Woodland. As the tornado moved ashore, destruction to trees was nearly total, with substantial damage to at least six structures.

The tornado ended abruptly only 1/3 of a mile after coming ashore at a point 5.6 miles north-northwest of Belton.



Ground Track of the Jarrell Tornado

THE JARRELL TORNADO

Maximum F-scale: F5

Path Length = 7.6 miles Path Width = 3/4 miles

County: Bell [2.4 miles]; Williamson [5.2 miles]

Beg: 30° 53.90'/97° 35.20' End: 30° 49.18'/97° 40.12'

The damage path associated with the Jarrell tornado actually begins in Bell County at a point about 0.8 miles northwest of the Prairie Dell exit from Interstate 35, near mile marker 280. The

tornado tracked south-southwestward across open country. Damage was primarily to trees, with only a couple of structures damaged.

The tornado remained primarily in open country as it crossed the Bell/Williamson County line before taking a more southwestward turn that took it to the northwestern edge of Jarrell. The tornado crossed the county line very close to where Williamson Road ends and County Road (CR) 304 (Bell County) begins. The tornado crossed CR 308, CR 305, and then CR 307. Where the tornado crossed each of these county roads, approximately 525 feet of asphalt was ripped off each of the roadways. This particular destruction was believed to be very close to the centerline of the tornado circulation.

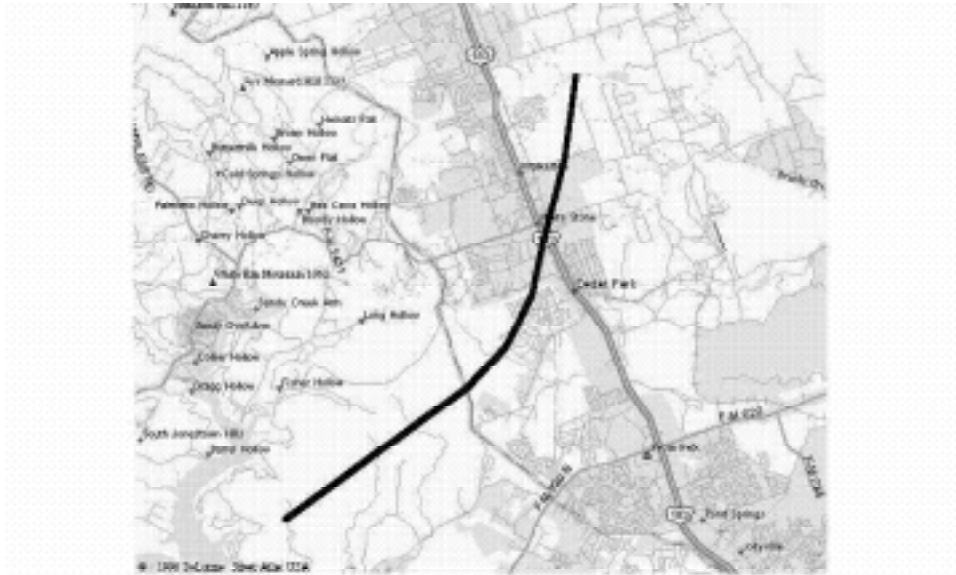
Observations recounted by eyewitnesses and revealed in interviews made by other members of the Service Assessment Team indicated that the damage path may not have been made strictly by one tornado. A number of eyewitnesses reported seeing several small, rope-like funnels before the character of the tornado changed drastically into the killer tornado.

As the tornado crossed the intersection of CR 305 and 307, a business on the corner was destroyed. The tornado moved into the Double Creek Estates subdivision at this point with total destruction. F5 destruction begins shortly after the tornado moved into Williamson County and continued until very close to the end of the damage path.

Moving through the Double Creek Estates subdivision and the surrounding area, the tornado widened to the maximum width of three-quarters of a mile. From the air, the ground appearance changed abruptly in the vicinity of CR 308 and continued until very near the end of the path. No definitive circulation patterns or suction spots were evident, but there was the noted obvious change in the appearance of the ground.

In the Double Creek area, approximately 40 structures were totally destroyed. One of the most striking signs in approaching this area was the distinct lack of debris of any size. Closer inspection showed lots of little debris, but no sign of large items. At least half a dozen cars were identified from the air lying in the open areas, most of them flattened and encrusted with mud and grass. Later, a ground survey revealed that most of the debris that was left in the area was extremely small, indicating the power of the tornadic winds. All 27 deaths associated with the Jarrell tornado occurred in the Double Creek area.

After passing through the Double Creek area, the tornado moved across CR 309 and into a heavily wooded area of cedar trees. The total destruction of the tornado ends abruptly shortly after entering the wooded area. However, a small swath of tree damage on the north side of the main damage path suggested the possibility of a multiple vortex pattern. No other evidence of multiple vortices was observed.



Ground Track of the Cedar Park Tornado

THE CEDAR PARK TORNADO

Maximum F-scale: F3

Path Length = 9.2 miles Path Width = 250 yds

County: Williamson [5.6 miles]/Travis [3.6 miles]

Beg: 30° 33.39'/97° 49.24' End: 30° 27.30'/97° 54.11'

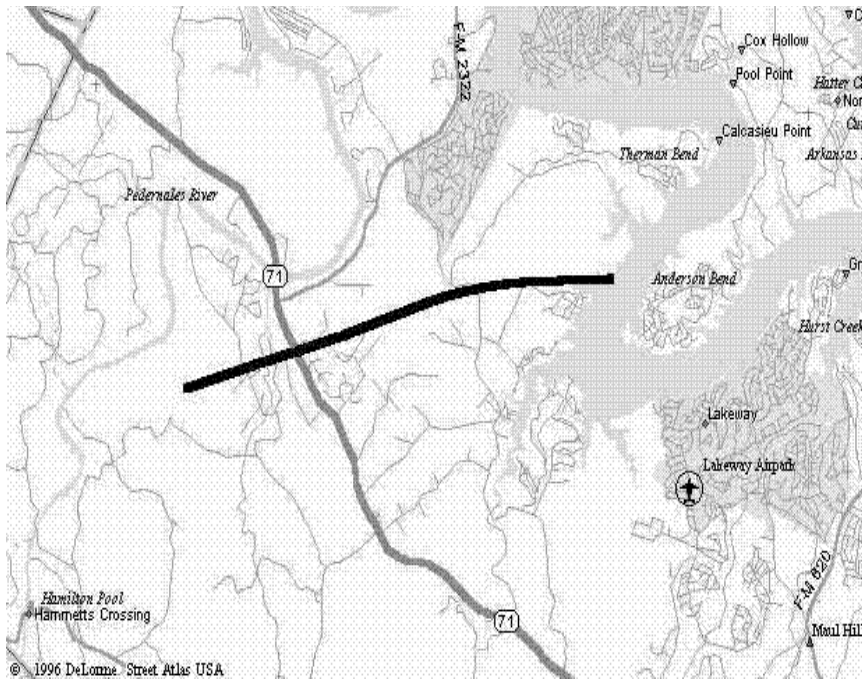
The Cedar Park tornado began about 3.5 miles north of Cedar Park, at a location 0.6 miles south of CR 178 and 1.4 miles east of the intersection of US 183 and CR 178. The initial damage was to trees, however, the ground survey revealed damage nearby to a church and a trucking company. The aerial survey did not reflect this damage as being in line with the damage path. It is quite possible this damage was caused by strong wind near the tornado. The beginning point was in a relatively open area, with damage primarily to a few trees and minor shingle damage to one house.

The tornado moved south-southwestward, skirting a residential area before it crossed CR 180 immediately east of US 183. It was at this intersection that an Albertsons grocery store was severely damaged. The tornado crossed US 183, causing additional damage to a number of businesses. One business on the west side of US 183 lost nearly the entire roof. Most damage to other businesses was believed to be minor.

A historic train located on the north side of CR 180, just to the east of US 183, was in the direct path of the tornado. While the engine remained on the track, a coal tender converted to hold diesel fuel and weighing approximately 65,000 pounds, including the 1,000 gallons of diesel fuel, was flipped over and thrown a short distance.

After crossing US 183, the tornado moved across Marquis Lane and North Park Circle through an area with widely scattered housing and a relative abundance of trees. Most damage to structures in this area was minor.

From North Park Circle, the tornado moved into the northwestern portion of Buttercup Creek, a subdivision of well constructed homes. Damage to homes was irregular, with one house losing a roof but the house next door losing only shingles. Damage ranged from F0 to F2. At this point, the tornado track was taking a gentle right turn and became more southwesterly. The tornado moved into a wooded area crossing into Travis County before ending 1.1 miles from Lake Travis. Damage in the wooded area was irregular, ranging from near total destruction of all trees to sections with about 10 percent of the trees down.



Ground Track of the Pedernales Valley Tornado

THE PEDERNALES VALLEY TORNADO

Maximum F-scale: F4

Path Length = 5.6 miles Path Width = 440 yds

County: Travis

Beg: 30° 23.35'/98° 00.75' End: 30° 22.39'/98° 06.25'

The Pedernales Valley tornado began on the shore of Lake Travis, destroying trees and a floating marina where nearly all of the watercraft were destroyed. While numerous trees were twisted and uprooted in this area, several structures sustained only what appeared to be minor damage that would be no more than F0.

The tornado was initially on a heading of 265 degrees as it moved into rough terrain. A number of structures sustained varying damage until the tornado reached Bee Creek Road. At that location, a Southwest Bell building housing telephone switching equipment was destroyed. The building was well-constructed and was one of several buildings which indicated at F4 rating for this tornado. Bee Creek Road takes a bend close to the telephone building, and across the street a house was destroyed with walls knocked down.

Approximately 2.2 miles from the lake, the tornado path takes a distinct dog-leg turn toward the southwest. The point at which this turn occurred also corresponds with a knoll. Trees and buildings at the top of the knoll were destroyed.

After the turn, the tornado assumed a heading of 250 degrees and crossed a major power distribution line. One steel tower was destroyed, bringing all lines to the ground. The tornado remained on the 250 degree heading, moving through the area described as the Hazy Hills subdivision. Numerous houses and several mobile homes were totally destroyed. Several houses survived but sustained major damage that made them totally uninhabitable.

The only death associated with this tornado occurred here, when one man was killed. He lived in a mobile home that was demolished and his vehicle was tossed several hundred feet. Service Assessment Team members were unable to learn whether he was in the mobile home during the storm or had left it to drive away.

The tornado continued west-southwest, moving across State Road (SR) 71. A number of well-built homes in the Hazy Hills subdivision were heavily damaged or destroyed. Crossing SR 71, the tornado moved into another subdivision with widely-separated houses in the Lick Creek valley, a steep walled creek that feeds into the Pedernales River. One stone-walled house located just north of Pedernales Drive and west of SR 71 was completely deroofed. Other structures in this subdivision sustained roof damage in the F2 range. After following the terrain into the cree, the tornado climbed another rise in the land before ending shortly after passing the crest of the small hill. As the tornado ended, damage was minimal to trees.