

efforts of first responders, assistance from each other, and their own good instincts and goodwill, the vast majority of civilians below the impact zone were able to evacuate the towers.

The National Institute of Standards and Technology has provided a preliminary estimation that between 16,400 and 18,800 civilians were in the WTC complex as of 8:46 A.M. on September 11. At most 2,152 individuals died at the WTC complex who were not (1) fire or police first responders, (2) security or fire safety personnel of the WTC or individual companies, (3) volunteer civilians who ran to the WTC after the planes' impact to help others, or (4) on the two planes that crashed into the Twin Towers. Out of this total number of fatalities, we can account for the workplace location of 2,052 individuals, or 95.35 percent. Of this number, 1,942 or 94.64 percent either worked or were supposed to attend a meeting at or above the respective impact zones of the Twin Towers; only 110, or 5.36 percent of those who died, worked below the impact zone. While a given person's office location at the WTC does not definitively indicate where that individual died that morning or whether he or she could have evacuated, these data strongly suggest that the evacuation was a success for civilians below the impact zone.²⁰⁰

Several factors influenced the evacuation on September 11. It was aided greatly by changes made by the Port Authority in response to the 1993 bombing and by the training of both Port Authority personnel and civilians after that time. Stairwells remained lit near unaffected floors; some tenants relied on procedures learned in fire drills to help them to safety; others were guided down the stairs by fire safety officials based in the lobby. Because of damage caused by the impact of the planes, the capability of the sophisticated building systems may have been impaired. Rudimentary improvements, however, such as the addition of glow strips to the handrails and stairs, were credited by some as the reason for their survival. The general evacuation time for the towers dropped from more than four hours in 1993 to under one hour on September 11 for most civilians who were not trapped or physically incapable of enduring a long descent.

First responders also played a significant role in the success of the evacuation. Some specific rescues are quantifiable, such as an FDNY company's rescue of civilians trapped on the 22d floor of the North Tower, or the success of FDNY, PAPD, and NYPD personnel in carrying nonambulatory civilians out of both the North and South Towers. In other instances, intangibles combined to reduce what could have been a much higher death total. It is impossible to measure how many more civilians who descended to the ground floors would have died but for the NYPD and PAPD personnel directing them—via safe exit routes that avoided jumpers and debris—to leave the complex urgently but calmly. It is impossible to measure how many more civilians would have died but for the determination of many members of the FDNY, PAPD, and NYPD to continue assisting civilians after the South Tower collapsed. It is