

calculations showed that the installed automatic sprinkler system was capable of delivering the minimum required water flow for control of office fires up to 4,500 ft². This was a small fraction of the 40,000 ft² size floors in the towers. In addition, in the stairwells, there were standpipes (for firefighters to connect their hoses) that were supplied with water by gravity feed from 5,000 gal tanks and by large fire pumps. A multifunction fire alarm system was intended to alert staff at the Fire Command Station within the building and provide voice and strobe alerts throughout. When turned on after the building had been cleared of people, a smoke purge system was intended to purge the hot, opaque fire gases from the building.

However, buildings were not (and still are not) required by the building codes or designed to withstand the impact of a fuel-laden jetliner. Although the impact of a Boeing 707 was stated by the Port Authority to have been considered in the original design of the towers, only one three-page document, in a format typically used for talking points was found that addressed the issue. This document stated that such a collision would result in only local damage and could not cause collapse or substantial damage to the building. NIST was unable to locate any evidence to indicate consideration of the extent of impact-induced structural damage or the size of a fire that could be created by thousands of gallons of jet fuel.

The Workplace

At the beginning of the workday, many of the roughly 40,000 people who worked in the towers and visited to conduct business or to tour emerged from trains in the massive subterranean station. They would take escalators and elevators to a one-story shopping mall, then pass through revolving doors to enter a spacious, 6-story-high lobby on the Concourse Level. There, they would cross paths with those who arrived on foot or by bus or cab.

Getting tens of thousands of people from the Concourse to their offices was no small task. This was accomplished by a combination of express and local elevators located within each of the building cores (Figure 1–9) that was novel at the time of construction.

- People traveling to floors 9 through 40 entered a bank of 24 local elevators at the Concourse Level. These were divided into four groups, with each stopping at a different set of eight or nine floors (9 through 16, 17 through 24, 25 through 31, and 32 through 40).
- Those going to floors 44 through 74 took one of eight express elevators to the 44th floor skylobby before transferring to one of 24 local elevators. These 24 were stacked on top of the lower bank of 24, providing additional transport without increasing the floor space occupied by the elevators.
- Those going to floors 78 through 107 took one of 11 express elevators from the Concourse Level to the 78th floor skylobby before transferring to one of 24 local elevators. These were also stacked on the lower banks of 24 local elevators.

While providing the desired high rate of people movement, this three-tier system used roughly 25 percent less of the building footprint than the conventional systems in which all elevators would have run from the Concourse to the top of the building, resulting in a building core that took up as much as one-half of the floor area. In addition, there was even more rentable space to be gained. At the top of each elevator bank, the machinery to lift the cabs occupied one additional floor. From the next floor up to the bottom of