

Lima Metro. Station Capacity and Evacuation Study.

The Lima Metro, regarded by Peruvians as Tren Eléctrico, is a metropolitan railway currently linking the south of Lima, with the center of the capital of Peru. The metro has Tramo 1 line constructed at grade level and on elevated viaducts, covering more than 21 km, the initial constructed section, and crossing almost 10 districts of the city.

A TY Lin International team conducted various metro station simulations with SimWalk to verify station capacities and clearance times during a simulated emergency evacuation event. Compliance to Peruvian building codes and to NFPA 130 code (US National Fire Protection Association) were used to benchmark simulated performance measurements.

Exit volumes applied to the platform level for the evacuation analysis included a full train (864 passengers) plus the people waiting on station platform (about 130) using 3 minute headways. The simulations with SimWalk allowed the following conclusions: Under a first station configuration, a fully loaded train plus platform bystanders, a total of 1016 people, would be able to clear the platform and reach a safety zone within NFPA timing requirements; assuming the use of both regular and emergency staircases plus one of the escalators.



If the use of escalators is forbidden, only 800 people would be able to evacuate the platform within 4 minutes and reach a safety zone within 6 minutes. With a second station configuration, which has a higher emergency staircases' capacity than the first configuration, 1016 people can be evacuated within time

Summary

TY Lin, an international engineering company, conducted capacities and evacuation studies of different metro stations in Lima, Peru. Different configurations showed for example that if the escalators would be forbidden in an emergency, not all people would be able to evacuate the platform according to Peruvian building codes.



requirements, using staircases only. If one of the escalators is included in the exit options, up to 1250 people can be successfully evacuated.

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