

# Models for evacuation procedures in big cities after massive earthquakes

November 26 2012

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Risk of fire and spatiotemporal distribution of stranded people after the earthquake.

Tokyo Tech's Toshihiro Osaragi and colleagues report on models for evacuation procedures in big cities after massive earthquakes based on the behavior of people in Tokyo after the Tohoku-Pacific Ocean Earthquake on 11 March 2011. The details are also described in the November issue of *Tokyo Institute of Technology Bulletin*:

[www.titech.ac.jp/bulletin/index.html](http://www.titech.ac.jp/bulletin/index.html)

The [Tohoku-Pacific Ocean](#) Earthquake occurred on 11 May 2011. On this day all rail services in the Tokyo Metropolitan area were paralyzed amid the unprecedented confusion that followed the tremor.

Thousands people were unable to contact families and friends, and in a state of uneasiness, many decided to return home on foot. Main roads were heavily congested with both cars and people, a state which severely obstructed the movement of emergency vehicles.

Here, Toshihiro Osaragi at Tokyo Institute of Technology describes the construction of several models that describe decision-making and behavior of individuals attempting to reach home on foot in the wake of a [devastating earthquake](#).

He has simulated the movement of individuals who have decided to return home on foot, and demonstrates the spatiotemporal distribution of those who might be exposed to hazardous city fires on their way home in the aftermath of a [massive earthquake](#), which has been predicted to occur in the Tokyo [Metropolitan area](#) in near future.

Osaragi research underscores the importance of considering pedestrian flow under such extreme scenarios in order to establish emergency evacuation procedures. "Using the model proposed, we can assess not only the potential number of stranded individuals, but also their detailed attributes," says Osaragi. "Such information would undoubtedly prove helpful in actual planning for immediate post-disaster mitigation."

**More information:** Osaragi, T. Modeling a spatiotemporal distribution of stranded people returning home on foot in the aftermath of a large-scale earthquake, *Natural Hazards*, Springer, (2012). [DOI: 10.1007/s11069-012-0175-8](#)

Provided by Tokyo Institute of Technology

Citation: Models for evacuation procedures in big cities after massive earthquakes (2012,

November 26) retrieved 4 July 2024 from <https://phys.org/news/2012-11-evacuation-procedures-big-cities-massive.html>

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