

## Analysis of the influence from the geometry of roads and other artificial structures to evacuation plans

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In future, the powerful natural external force (e.g. earthquakes, tsunamis, local heavy rain) will occur. The evacuation is important and effective to guard our lives against such natural external force, because the prevention structure may be destroyed by the force.

The local governments offer hazard map and disaster prevention map. The people plan the evacuation behavior and decide the evacuation route. And the validation and the safety of evacuation behaviors are checked by town walks and trainings. But, It is difficult to understand the distance to evacuation place from these maps. It is possible to plan more reasonable evacuation using the information due to such road plane structure and its clarification.

In this research, it is considered to analysis influence of road plane structure to evacuation areas using the distance and the place which the people can reach the evacuation place within one time.

Specifically, we try to examine the reachable places to evacuation site and a direct distance from the evacuation place to the farthest reachable place, and the difference of these at time intervals. If the direct distance is very shorter than evacuation distance, it seems to prevent to increase evacuation because of some physical environments (e.g. roads, railways and rivers). Furthermore, we try to visualize the reachable places to evacuation site at time intervals. It seems to be able to know clearly the complicated road structure and some facilities across the evacuation route using this visualization.

Keywords: natural disaster, evacuation area, evacuation route, road structure