Simulation of The Earthquake Occurrence Effects on the Traffic and Transportation of Urban, Areas Using Geographic Information System(GIS),A Case Study: Khorramabad

Abstract:

The urban transportation network had important and highly efficient role in critical condition after the earthquake, especially in large and populated cities. Although there is no guarantee of safety during the earthquake but with early detection of high risk areas and also planning for necessary preparedness can save life of people and specifically can reduce injuries and damages caused by the earthquake. With simulation of earthquake on the traffic and transportation within the city can identified and defined the points that have highest blockage and vulnerability, due to falling debris and the accident occurred in the streets. Inter-urban transportation network of Khorramabad does not maintain their performance during the earthquake crisis. The main reason is small width of streets and their closure due to falling debris and was followed by a crash between vehicles. The method of present study is analytical-applied that have been based on library research, document review, electronic and field studies. For this important taken help GIS and software of Site Builder 3D. First changed AutoCad drawings to the GIS format. For making basic maps of the 63,000-point data, DEM map with Cell Size was prepared equal 2. surface and linear maps followed with 24,000 data such as the type of building, the height building, the quality of building, the life of building, the closest section of building to the street, useful sidewalk and roadway width, being one-way and two-way, round-trip time of vehicles and length of streets was entered into the system. Then using the relations of $x = x^h \left(\frac{3}{5}\right)^{n-1}$,$\Delta x = \frac{1}{2}at^2 + v_0\mathrm{t}$ that the amount of debris falling was simulated and calculated based on the height of the building and movement of vehicles, the results showed that due to had done falling debris on the most streets in the western part of zone of 2 in Khorramabad, in some streets to 84 percent of the street level had blocked, also due to high traffic and accident occurred between vehicles, some streets are completely blocked. The main streets are: 17 Shahrivar, East Kashani, Shohada, Khayyam, Motahari, Imam Khomeini, Piruzi, Hafez, Abuzar can

be mentioned parts of western and eastern coastal. Obstruction of streets has led relief do not done in useful time periods based on the simulation. This study showed that the use of GIS and ancillary software such as AutoCAD, and Site Builder 3d, modeling and analysis can be performed with high accuracy. And it could allow urban planners and managers in the simulation of events that is not possible on the cities in the natural form (eg earthquakes), until managers with managing of it prevent from becoming a crisis and disaster.

Key words: Simulation, Earthquake, Traffic within the city, Transportation, Geographic Information System (GIS).

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