

عنوان مقاله:

Effects of Multi-directionality on Pedestrian Flow Characteristics

محل انتشار:

نشریه بین المللی مهندسی حمل و نقل، دوره 3، شماره 3 (سال: 1395)

تعداد صفحات اصل مقاله: 8

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خلاصه مقاله:

In design and analysis, standard references assume the pedestrian flow as unidirectional. In reality however, pedestrian flow is usually bi-directional. The main question pursued in this paper is that whether the main characteristics of pedestrian flow the same under uni- and bi-directional conditions. In order to achieve this goal, effect of bi-directional stream is investigated on behavior and main parameters of pedestrian flow. Part of the data for the research was collected via controlled experiments and another part was videotaped from Isfahan walkways. It is shown that under bi-directional condition, mean speed of pedestrians is significantly more than the similar condition under uni-directional regime. Moreover, relative discrepancy between pedestrian speeds in two types of flow becomes evident in densities higher than 0.6 person/m². Speed of pedestrians in the majority and minority group were recorded and there from it was concluded that the density in the vicinity of a person has a greater effect on her walking speed compared to the opposite flow. In order to avoid colliding to opposite flow, pedestrians try to follow the preceding person and therefor lines are established within the crowd. Fundamental diagrams are also derived for different directional ration. As the index of disorder, entropy was calculated for uni- and bi-directional flows. It was concluded that entropy was lower for bi-directional flows which means that order improves under bi-directional regime of flow. This is in accordance with less freedom of movement under bi-directional regime.

کلمات کلیدی:

Fundamental diagram, pedestrian flow, bi-directional flow, traversing lines, entropy

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