Safety performance measures for railway stations

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Purpose of Research

The railway system in Japan is generally safer than that in other countries. However, falling and from the platform of the passengers, the contact accident between train is generated not a little, it is necessary to establish safety strategy. The purpose of this study, station structures and equipment, and its usage is, is to establish a quantitative evaluation methods the impact of the passengers safety and trusty.

Summary of Research

In order to improve the pleasantness and safety of public transport services, We developed ICE (Index of Comfortable and Easeful Public Transportation)[1] along with the Ministry of Land, Infrastructure and Transport (MLIT). In the present study, the safety level of railway platforms, which was not included in ICE, is evaluated based on four major indices: structure, passenger flow, train movements, and passenger characteristics. From these indices, sub-indices were set which can be quantitatively evaluated.
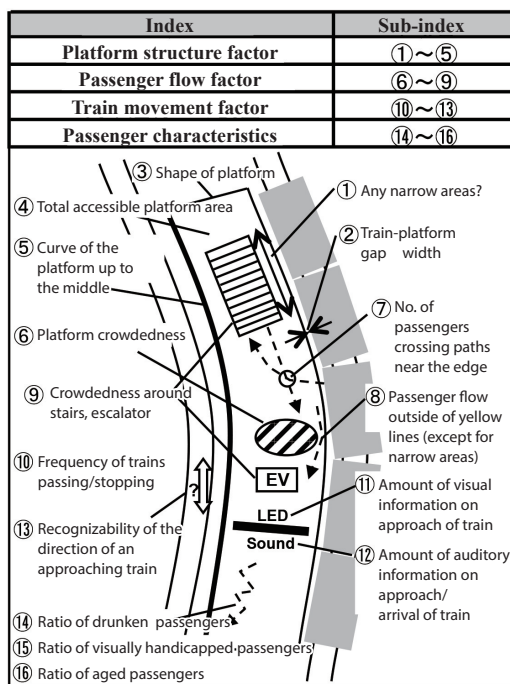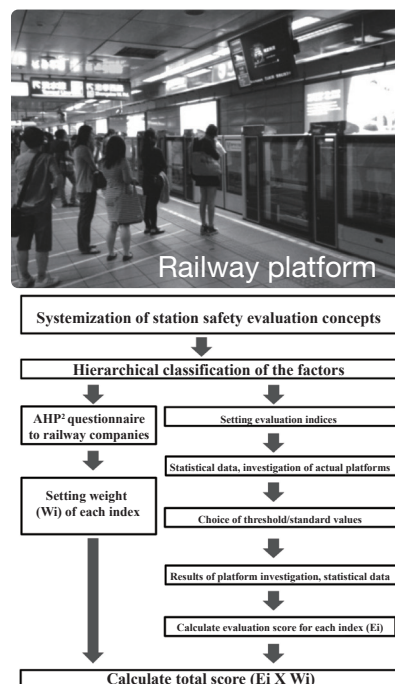

Fig. 1. Platform safety indices.

Fig. 2. Flow of safety evaluation score calculation steps

Points
- **Indices weighted in accordance with multivariate analysis of actual data. Good reproducibility**

Comparison with Conventional or Competitive Technology

In a previous attempt to evaluate the safety of a railway system, statistical data on actual railway accidents were used to calculate their probability distribution, and causes of and countermeasures against serious accidents (crash, derailment, etc.) were investigated. However, human injury or death in a station, though more frequent, was not investigated. Another study set up a method to comprehensively evaluate the convenience, pleasantness, and execution certainty of train change in a Shinkansen station that was the same as the present study except that it did not include safety evaluation. The present study is the first to quantitatively evaluate the safety level of a railway station from the viewpoint of passengers.

Expected Applications

Can evaluate the relative safety level before and after a safety measure by the railway company or the relative safety of each platform side to decide the order in which new measures are executed.

Challenges in Implementation

Use actual data to make this quantitative safety evaluation method more useful and convenient.

What We Expect from Companies

Collaboration with a railway company or safety management firm to apply the present method to an actual platform.

Future Developments

June 2015   Started further study to improve usefulness of the present system based on actual data.

1) MLIT Transport Consumer Policy Division: Investigation into improved "pleasantness and safety" of public transport services, 2004
2) AHP: Analytic Hierarchy Process

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