

1. Agent-based modelling and analysis of security and efficiency in airport terminals

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Abstract: Both security and efficiency are important performance areas of air transport systems. Several methods have been proposed to assess security risks and estimate efficiency independently, but only few of these methods identify relationships between security risks and efficiency performance indicators. To analyze security, efficiency, and the relationships relations between them, an agent-based methodology was proposed in this work. This methodology combines an agent-based security risk assessment approach with agent-based efficiency estimation. The methodology was applied to a case study that analyzes security regarding an Improvised Explosive Device (IED) attack, different commonly used efficiency performance indicators in the aviation domain, such as queuing time for passengers, and the relationships between them. Results showed that reducing security risks and improving efficiency were not always conflicting objectives. Reducing the number of passengers before the security checkpoint was found to be an effective measure to reduce security risks and improve efficiency aspects. Furthermore, results showed that airports should attempt to spread passengers across the available space as much as possible to reduce the impact of an IED attack. © 2019 Elsevier Ltd (61 refs)

Main heading: Airport security

Controlled terms: Airport buildings - Autonomous agents - Benchmarking - Computational methods - Efficiency - Explosives - Risk assessment - Risk management - Risk perception - Simulation platform

Uncontrolled terms: Agent-based methodologies - Agent-based modelling - Airport terminals - Conflicting objectives - Improvised explosive devices - Performance indicators - Security risk assessments - Security risk managements

Classification Code: 402.2 Public Buildings - 913.1 Production Engineering - 914.1 Accidents and Accident Prevention - 971 Social Sciences

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