

# Probabilistic Assessment of Road Risks for Improving Logistics Processes

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**Abstract.** The Intermodal transport represents a solution, which has proved its effectiveness, for the supply of the various logistic platforms. Road transport is also one of the means of transport used in the logistic function and is the most common. This type of transport is especially recommended for medium and short distance journeys. Transport is an important link in the logistical chain. Several constraints accompany this transport function such as: delays, flexibility, diversity of merchandise, and road risks. To identify this last problem of road risk and to minimize its influence, a Bayesian network has been developed in this paper. Through experts' surveys and research in the literature, the various risks were identified. The structure of the Bayesian network is defined on the basis of this census. The network settings vary from one situation to another. The exploitation of statistics and historical files of the transport company has allowed to define the parameters (probabilities) given in the example studied in this paper.

To prevent risks and anticipate failures in the logistics function, while optimizing a utility function, an influence diagram was used. This tool has provided the ability to control actions and make decisions safely. An example of merchandise transport between two port companies has shown promising results and better efficiency in the anticipation of actions.

## 1 Introduction

The number of logistic platforms continues to grow. Also, demand on merchandise continues to increase. Movement of merchandise within and outside a company is part of the logistic function. Ensuring logistics between multiple platforms is an activity that needs to be well managed and never left to chance. Managing logistics means organizing, executing and controlling the movement of merchandise. Several synthesis works, prepared by experts, have proposed techniques and means whose purpose is to ensure handling movements, transport, supply, deliveries, and management of the production flows, while respecting the deadlines and costs.

In this context, transport and logistics are part of the same activity. To understand and analyze the impact of failures in merchandise transport business on the logistic function,

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