The Netherlands
Research School for
Transport, Infrastructure
and Logistics

TRAIL

A situated multi-agent system for urban freight in the Randstad

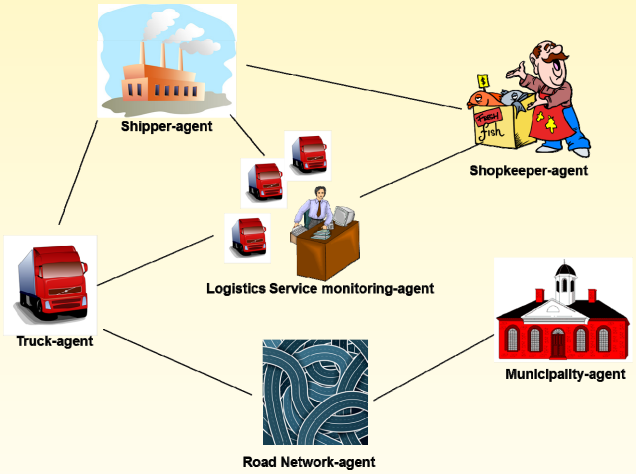
Introduction

Multiple heterogeneous stakeholders with diverse interests and distributed decision making process add complexity and unpredictability in the large city logistics domain. This complexity demands well designed approach for policy analysis which cannot be achieved by traditional modeling techniques due to their restrictive hypothesis. This research explores the characteristics of city logistics decision making process and attempts to explain gap between current city logistics policy and practice. It introduces concept of multi-agent system and discusses conceptual framework for gaining insight into city logistics decision making process.

City Logistics

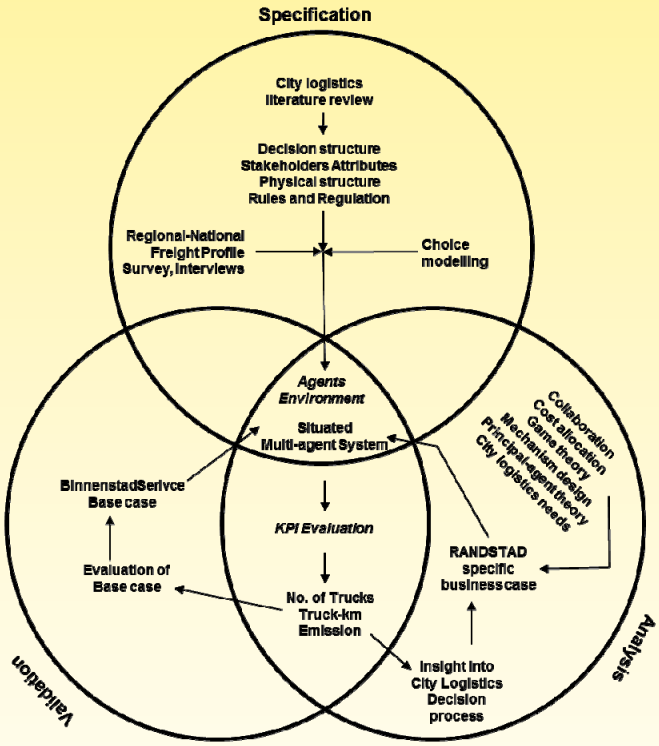
- Goods delivery trucks causes problems like congestion, pollution, poor accessibility and safety
- Frequent delivery, inefficient use of trucks, poor routing, improper/unauthorized (un) loading, high emission vehicles and less consolidated deliveries are primary reasons for these problems
- Multiple stakeholders with conflicting objectives and autonomy makes city logistics a distributed decision making system

Situated Multi-agent system for urban freight



- Retailer, Suppliers, Logistics providers and administrators (i.e. municipality) are main stakeholders
- Describing a system from the perspective of its constituent units (i.e. Stakeholders)
- Interactions among different agents contain different mechanism like negotiation, adaptive learning, cooperation, collaboration.
- Establishing each stakeholder as independent entity can help exploring dynamics of interaction

Conceptual framework for urban freight decision making analysis



- Specification, Validation and Analysis cycle
- Capture dynamics of city logistics decision making process
- Create knowledge base about the interaction among heterogeneous stakeholders of urban freight domain.
- Analyze sensitivity of varieties of technology trends, business trends, and policy scenarios
- Using different settings, scenarios and regulations, different business cases (RANDSTAD specific) can be created and simulated to gain insight into logistics related decision making processes and forces governing them

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