







### smaRTI – Smart Reuseable Transport Items

Global trade and its associated goods streams are growing continuously, and load carriers are one of the most important resources in logistics. The smaRTI project is therefore developing an approach that covers all sectors and supply chains for an intelligent material flow, taking all important transport paths into account, be they air, road, rail or water. At the end this will create a multimodal overall concept with intelligent reusable load carriers so as to optimise the entire supply chain.



### IoT-A – Internet of Things Architecture

A global network of intelligent devices and objects that communicate with each other and their environment – research around the Internet of Things is all-pervasive. The IoT-A project creates an architectural reference model for this and establishes a series of key components to move away from isolated solutions towards a common framework for the Internet of Things.



### Swarm Intelligence for Logistics – Cellular Transportation Systems

»If things know where to go, they can go there straight away.« With this simple but evolutionary sentence you can understand the idea of Cellular Facility Logistics as the logical consequence of the »Internet of Things«. The decentralized control of material flow and logistics systems is the essential characteristic of this new concept. The aim of our experiment with swarm intelligence is to design supply chains in a more energy-efficient way and be able to react more flexibly to unforeseen occurrences. Therefore cellular transport systems are revolutionising intralogistics. Massively constructed and

inflexible continuous conveyor technology is replaced by numerous small autonomous vehicles which guarantee a clearly more flexible material flow.

### Our Facilities for Research on the Internet of Things

#### Autonomous Identification: openID Center

The openID-center at Fraunhofer IML is a 1,500 m<sup>2</sup> platform with the aim of researching logistics software and auto-identification systems. Since 2005 we have been working in pioneering projects together with partner organisations from industry and commerce. The conclusion of each project conducted in this experimental field provides a fully functional, expandable solution.

#### LivingLab Cellular Transport Systems

With LivingLab cellular transport systems we implement swarm intelligence following the example of the animal kingdom. The lab is built similar to a high-rise store with workstations. Intelligent, interlinked transport vehicles carry out transports in this test environment. They coordinate with each other independently without any central control.

