

**LOGISTICS FOR  
RECYCLING MANAGEMENT**





## INTEGRATED PLANNING AND OPTIMIZATION

Waste is increasingly treated and recycled for making it available as raw material for the production. This presents public as well as private enterprises of the waste and recycling management with the challenge of increasingly complex logistics. Together with rising costs, this leads to enhanced requirements concerning quality and efficiency of logistic systems. In addition to this, legal framework, market and client's requirements change permanently. An efficient and economic performing logistics - adapting easily - offers companies to take the lead. As innovative partner, we develop sustainable solutions: from the first idea right up to the realization. For this we apply innovative methods as well as tried and tested procedures which make your logistic systems and processes more efficient and effective.

### Make complexity controllable

The increasing complexity of waste and recycling management effects first of all the basis processes of the respective functional units of the company. In addition to this, it requires a close co-operation of wide logistic networks across companies. To make these process structures controllable and plannable, companies demand new methods and tools for logistics projects within the own company and across companies. Applicable material flow management and monitoring concepts offer comprehensive data collection for providing evidence to administration, system operators and business partners.

The planning and optimization of transports of waste and secondary raw materials substantially contribute to the profitability of recycling management. Fraunhofer IML offers the design of efficient transport chains and the planning of complex logistic networks, which are relevant to all companies of the waste and recycling management sector. Further Fraunhofer services are the optimization of waste collection and transport. Here, we focus on the requirements of both municipal and industrial waste management. By means of district and tour planning, issues such as the collection as well as the logistically

optimized transport of waste to recycling and incineration sites are supported. In addition to this, a comprehensive analysis also covers the selection of appropriate carriers and containers as well as the optimization of logistic chains with respect to environmental parameters (carbon footprint, ecological and economic assessment).

A further challenge of the recycling management is the application of modern software and new communication systems (RFID, telematics, etc.); their implementation into recycling management may be the crucial step from a waste disposer towards the profitably operating supplier of secondary raw materials. When looking at and optimizing the interaction of staff, processes and technologies as a whole, there is an opportunity to tap existing potentials. Fraunhofer IML provides a comprehensive process optimization directed to the requirements of the waste and recycling management and a competent assistance for the selection, adaptation and introduction of appropriate information and communication technologies.



### Procedure

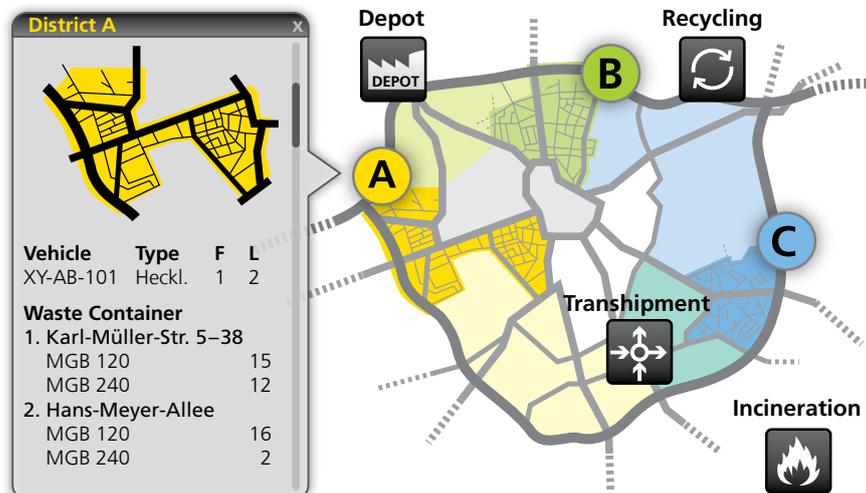
In optimization projects Fraunhofer IML pursues an integral approach and assists its customers from the first analysis up to the successful implementation.

In a first step a process analysis serves for examining the actual situation within the enterprise sectors relevant for the project. With the aid of this analysis potentials will be localized and demonstrated in the process flow. Starting from this various action scenarios will be developed and based on the actual situation evaluated in view of costs benefit. Phased plans for the implementation of a suitable scenario and realization assistance conclude the project. Here the close cooperation with the staff of your enterprise is important to consider enterprise specific features on the one, and on the other hand to support the acceptance and motivation for the realization of the jointly developed measures.

### List of services

- Development of enterprise logistics strategies for the medium and the long term
- Business process and logistic system optimization
- Re-organization of the installation and process organization to reduce costs and processing times (increase of the service level and of the customer focus)
- Selection of software and telematic solutions
- Integral analysis, planning and conception of complex logistic networks
- Design of efficient transport chains
- District and tour planning
- Optimization of waste collection, transport and transhipment
- Life cycle assessment, determination of carbon footprint
- Weak point and potential analyses
- Cost-benefit analyses, economic studies
- Implementation and realization assistance
- Feasibility analyses, market studies and training courses

Numerous software projects are developed at Fraunhofer IML providing planners extensive tools, e.g. applications for process optimization, tour and district planning. In addition to that also customized software prototypes are developed.



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