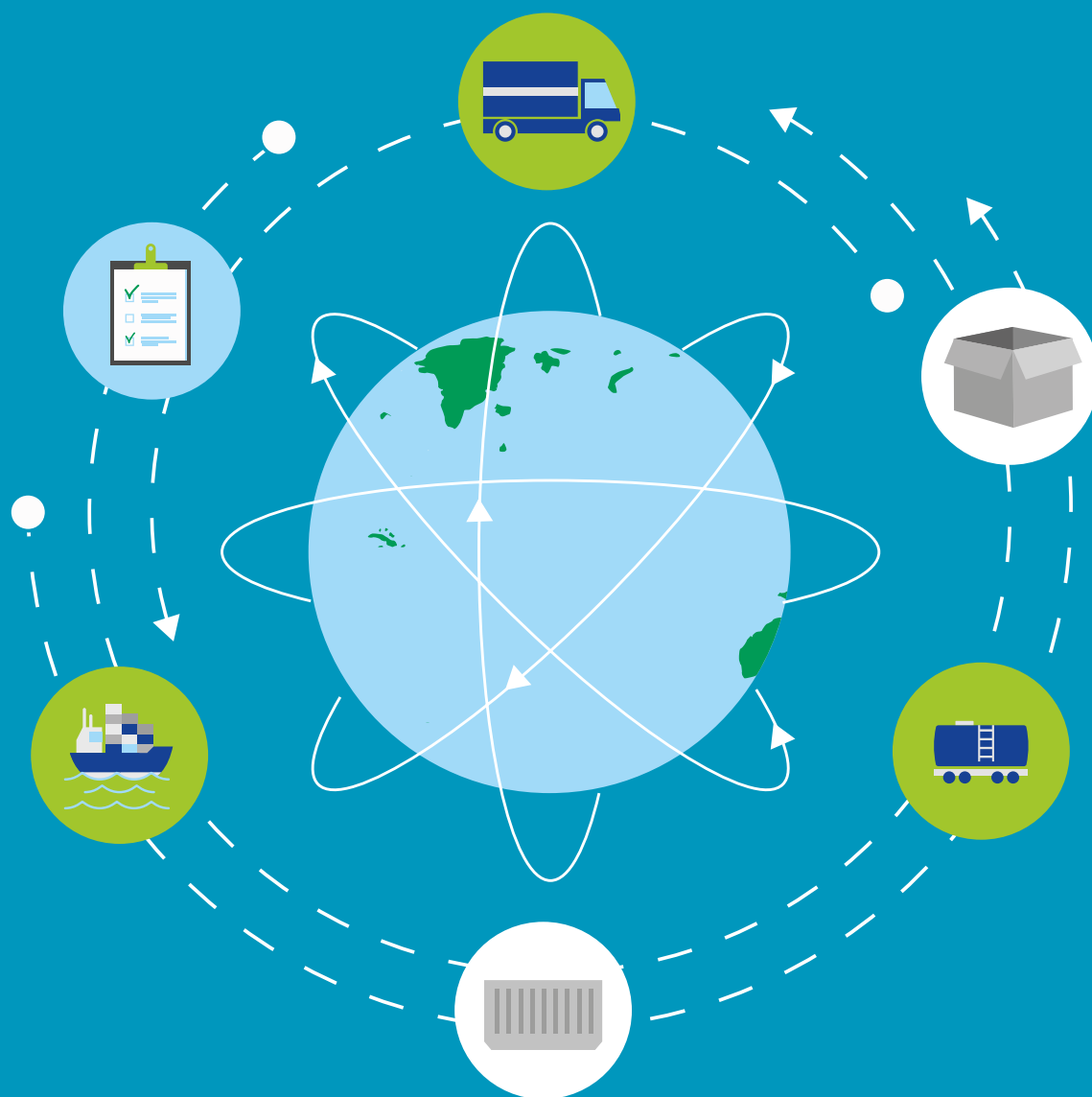


Mobility of the Future

Preliminary Results

Mobility of Goods

Research, technology and innovation from Austria (as at: June 2016)



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Figures

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Freight transport of the future

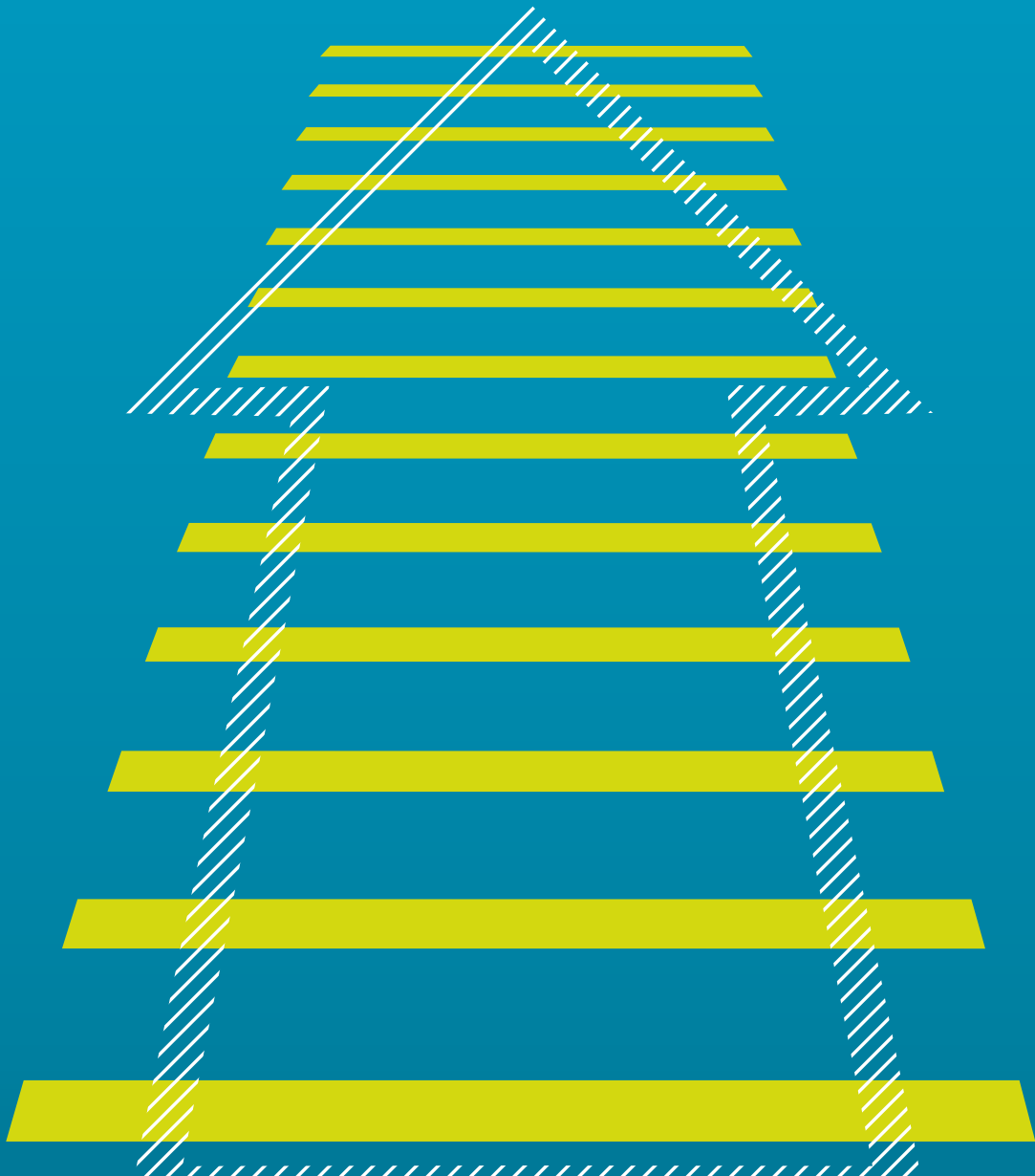
The logistics industry is in upheaval. Growing cities, e-commerce and smart production processes are new challenges for the transport logistics industry. These include the increasing number of small-scale deliveries in cities, which is having an impact on air quality, noise and traffic volumes. However, these significant challenges also give rise to opportunities for making the transport of goods more efficient and more environmentally friendly. It's about alternative propulsion systems and the conversion to environmentally friendly modes of transport, such as the railways. It's also about using networking, digitisation and cooperations to organise the transport of goods efficiently and to sharply reduce the environmental burden. The Federal Ministry of Transport, Innovation and Technology (bmvit) is supporting the search for new ways in the transport industry. With the research programme Mobility of the Future, the bmvit is placing a special focus on projects that research, develop and try out new forms of logistical organisation. From 2012 to 2016, the bmvit supported 62 transport logistics research projects with a total of EUR 12.8 million. This brochure gives you an overview both of the projects completed to date and of the national and European activities that the bmvit is involved in.

[Federal Ministry of Transport, Innovation and Technology](#)

Contents

| | | |
|-----|---|----|
| 1. | Shaping the future of mobility. | 5 |
| 2. | Mobility of goods. Taking stock. | 8 |
| 3. | Research. Develop. Innovate. | 9 |
| 4. | Exploring. Sounding out. | 26 |
| 5. | Building up knowledge. Creating foundations. | 42 |
| 6. | Creating networks. | 51 |
| 7. | Cooperating across borders. | 54 |
| | a. Transnational R&D projects | 55 |
| | b. European R&D projects | 60 |
| 8. | Shaping Europe. Realising visions. | 65 |
| | a. The European technology platform for logistics ALICE | 66 |
| | b. Shift2Rail Technologies for Sustainable & Attractive European Rail Freight | 68 |
| 9. | Promoting the next generation. | 69 |
| 10. | Creating structures. Closing gaps. | 72 |
| | a. Endowed Chair for Sustainable Transport Logistics 4.0 | 73 |
| | b. Urban mobility labs | 74 |
| 11. | Networking. | 76 |
| | a. Networking ideas. | 77 |
| | b. Networking results. | 78 |
| | c. Networking women. | 79 |
| | d. Networking the next generation. | 80 |
| | e. Strengthening topics. | 81 |
| 12. | List of grant recipients | 82 |
| 13. | RTI projects by focus | 84 |

1. Shaping the future of mobility.



Impact objectives and activities in applied research

The goal of the **RTI strategy of the Austrian Federal Government** is for Austria to rise up the ranking of the Innovation Union Scoreboard¹ from the group of Innovation Followers to the group of Innovation Leaders. The Federal Ministry of Transport, Innovation and Technology (bmvit), which according to the Federal Ministries Act is responsible for economic-technical research and applied research in Austria, defines **three impact objectives** for its activities from this:

- To increase the research, technology and innovation intensity of the Austrian business sector
- To develop technologies for a modern, efficient, reliable and safe infrastructure for overcoming the major challenges of the future: climate change and resource scarcity
- To increase the number of people employed in the area of technology and innovation with special attention being paid to increasing the proportion of women

In order to address these impact objectives in the field of applied research, the bmvit is taking measures on **international cooperations** that support the participation of Austrian companies and research institutions in the development, operation and use of space infrastructures and programmes, measures on the **RTI infrastructure** for positioning Austria as a leading location for technology research in the area of non-university, business-orientated research, and measures on **RTI grants**. In doing so, the bmvit aims to increase the quality and quantity of applied research and technology development, especially with regard to the topics of mobility, environment and energy, production, information and communication technologies (ICT), security, space and human resources, and at the same time to increase the proportion of women in qualified positions in the area of Research, Technology and Innovation.

The departments, such as the Unit for Mobility and Transport Technologies, are developing **multi-annual RTI programmes** for each of the identified areas with strategic and operational targets, such as those for **Mobility of the Future**², which applies to the period from 2012-2020. Annual thematic **open calls** on **individual topics** such as **Mobility of Goods** will subsequently be derived from this, furnished with **budgets** and **instruments** defined for them. The Austrian Research Promotion Agency (FFG) will be commissioned with processing the individual open calls.

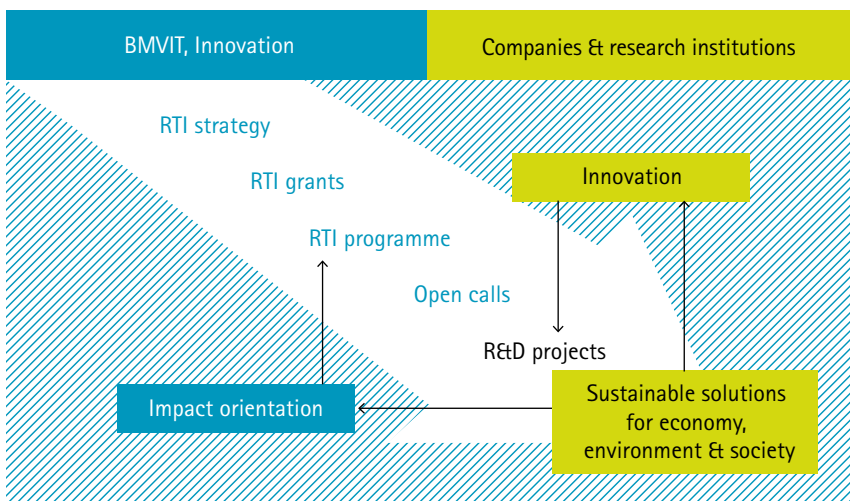


Figure: From the RTI strategy to sustainable solutions for economy, environment and society

Applied research generates new knowledge by focusing on a specific application.

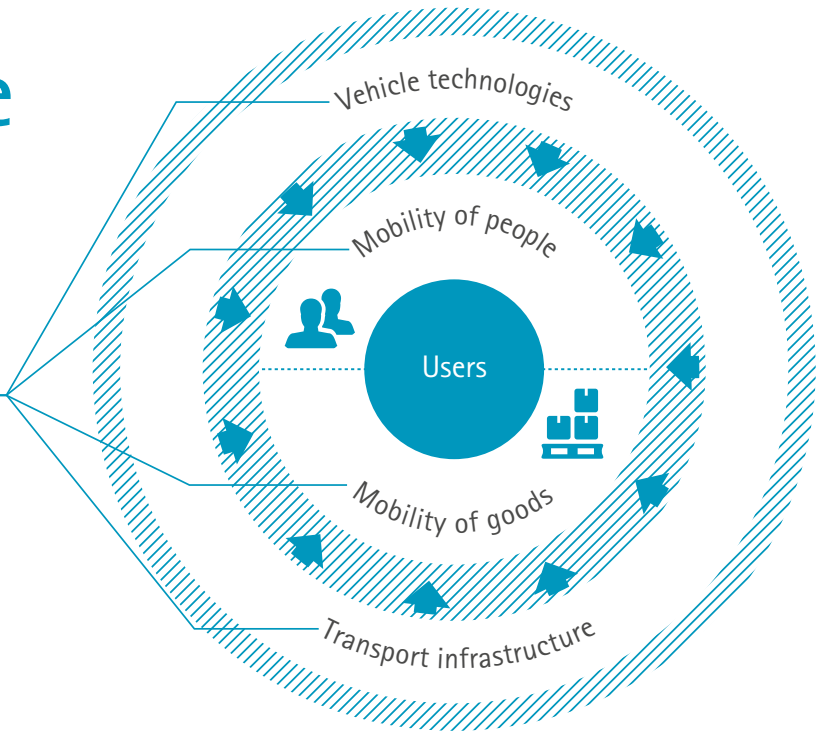
Target group of the applied research grant: Companies and research institutions which are interested in building up knowledge in the respective fields of application, such as mobility and/or which would like to research and develop new or improved products, processes, services or business models in the fields of application and innovate in these.

¹ http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards/index_en.htm (as at: 06.06.2016)

² <http://www.bmvit.gv.at/mobilitaet/index.html> (as at: 06.06.2016)

Mobility of the future

- ➔ Duration: 2012–2020
- ➔ Budget: approx. EUR 15–20 million/year
- ➔ 4 thematic fields



➔ Strategic programme objectives

Society

- Usability and accessibility of the transport system
- Sustainability forms and patterns of mobility
- Quality and availability of the transport infrastructure despite difficult economic conditions
- Ensuring the supply of goods and services

Environment

- Reducing emissions
- Reducing energy and resource consumption
- Balance of interests between transport route, human habitat and ecosystem

Economy & Research

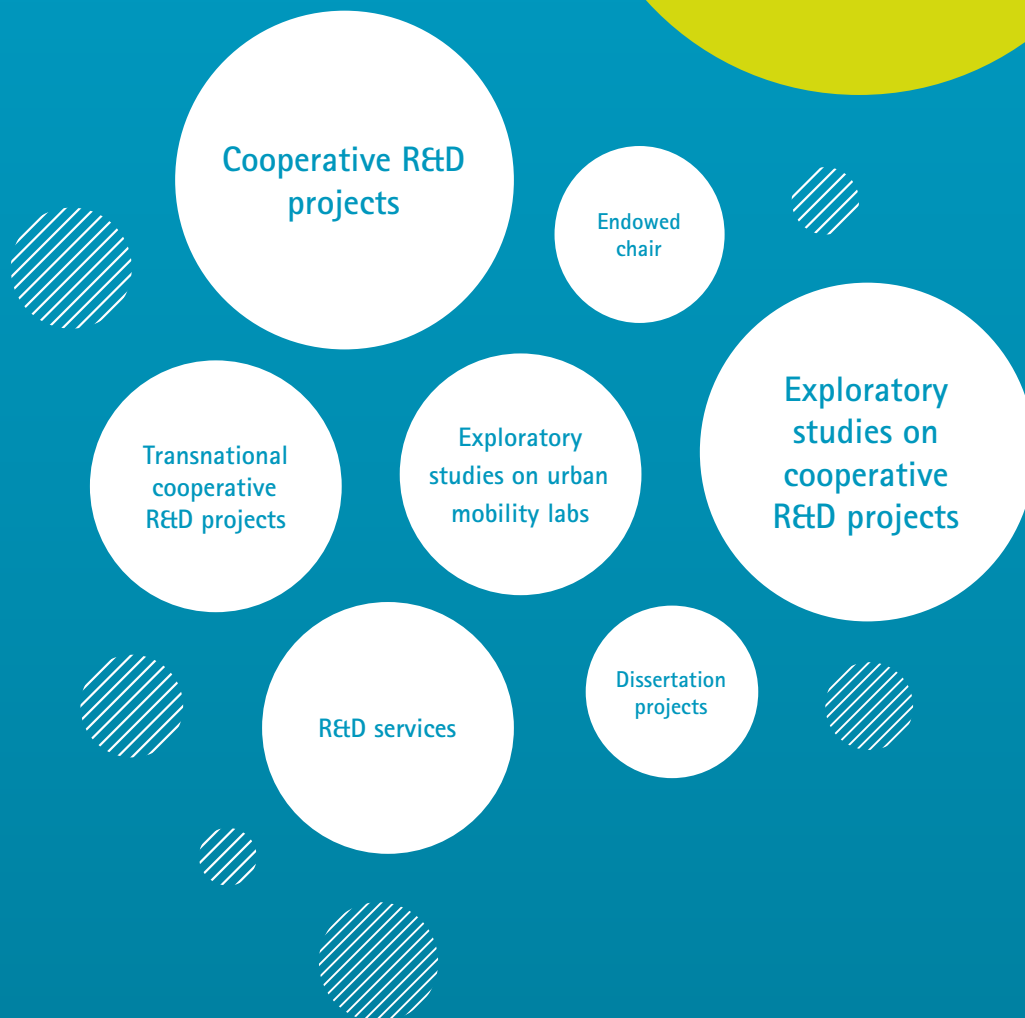
- Competitiveness in the transport sector
- Competency leadership in the area of mobility
- Building up and accelerating international cooperations

➔ Operational programme objectives

- 1 Supporting **technological innovation** in the area of mobility
- 2 Supporting **social and organisational innovation** in the mobility system
- 3 Strengthening the **connection between RTI policy and transport policy**
- 4 Expansion of **knowledge and networks** in the area of mobility

2. Mobility of Goods. Taking stock.

2012-2016:
62 RTI projects were supported with EUR 12.8 million in grants on the topic of Mobility of Goods, including:



3. Research. Develop. Innovate.

At the heart of Mobility of the Future are cooperative research and development projects. Companies research and develop new or improved products, processes and services for the transport of goods and the transport industry in these projects together with other companies or research institutions.





KOLAMBRA

An integrated organisational concept for the sector-orientated consolidation of urban streams of goods

The project developed a "matching platform" for the logistics industry, i.e. a kind of partner exchange for the urban transport of goods.

Starting from the notion that customers within an industry have similar requirements for transport services, goods transport are merged on a single platform by industrial sector. The optimised (bundled) streams of goods should then be handled by selected urban logistics providers (so-called preferred logistics partners) which have a seal of quality and are listed on an open, urban logistics platform. The preferred logistics partners listed on the platform have both an audited standard of quality and a scalable level of efficiency due to their shipping structure, which enables any consolidation and synergy effects to be used as effectively as possible - to the benefit of the sender (lower rate) and recipient (fewer deliveries).

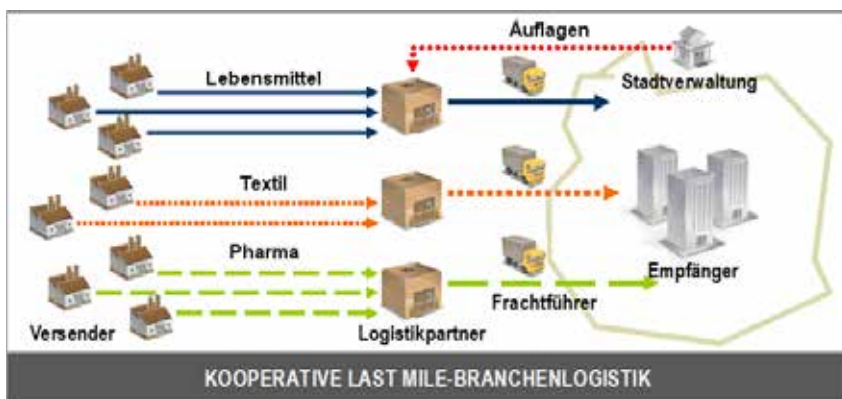


Figure: Cooperative last-mile industry logistics, source: RISC Software GmbH/Robert Keber

“ Certification of the services AND service providers offered on the platform guarantees high quality standards in respect of fleet, pollutant emissions and drivers' working conditions. The concept is also considered an intelligent alternative to less purposeful city toll systems when used in conjunction with a chargeable annual sticker with various grades of quality. ”



Andreas Krawinkler, University of Vienna - Institute for Business Administration

+ Impact

The project has the potential to lead to a reduction in "unwanted" goods traffic in cities. The certification offers incentives to improve the working conditions of hauliers as well as to increase the quality of transport, thereby promising to contribute to the strengthening of the regional transport industry.

Implementation

Based on the project outcomes, a start-up company called Consistix GmbH was founded in order to implement the qualification and bundling approach in urban logistics over the long term.

Contact:

Karl Dörner, University of Vienna, Institute for Business Administration

Partners:

SATIAMO GmbH, University of Applied Sciences Upper Austria, RISC Software GmbH, i-LOG Integrated Logistics GmbH, Johannes Kepler University of Linz - Institute for Production and Logistics Management

Project duration: 09/2013 – 02/2015

Research staff:





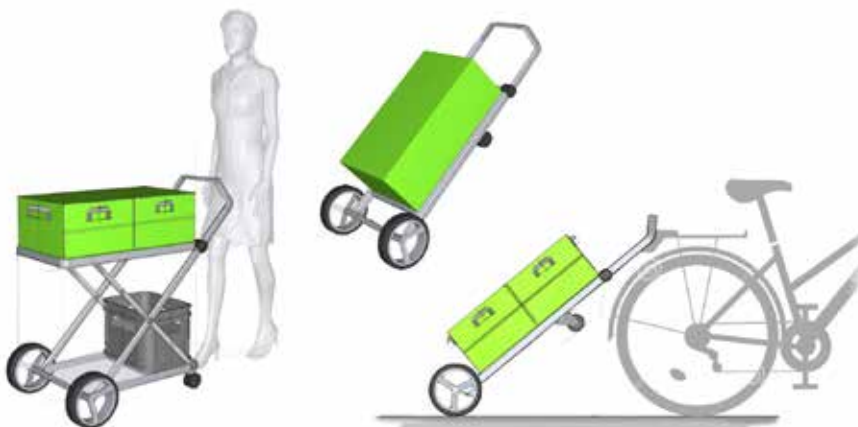
SUSTAINABLE MOBILITY OF GOODS IN CITIES

NAHTRANSPORT

Development of a non-motorised goods transport system for local deliveries

In order to optimise the last mile of shopping trips, a non-motorised goods transport system was developed to enable the shift from motorised to non-motorised shopping trips.

The project began with the idea to develop a convenient and environmentally friendly means of short-distance transport for the biggest possible group of users (universal design, design for all) in the form of a solution that combines pedestrian and bicycle transport. This involved developing concepts for innovative products (means of transport for pedestrians and cyclists) and procedures (organising use, management systems). For this means of short-distance transport, a computer-based management system for rentals was set up and the context of different settlement structures taken into consideration. Concepts for the parking infrastructure needed in housing estates and commercial areas were also elaborated.



Figures: The short-distance transporter

|| The customer survey performed showed a large willingness to use the short-distance transporter – 60% of respondents indicated that they would use the developed means of transport. 88% indicated that the means of transport would increase convenience when shopping. Although the project involved designing a rental system, the survey shows that the idea of ownership still plays a big role – one half of respondents indicated that they wanted to own the short-distance transporter privately. **||**



Bernhard Rothbucher, SYNOWAYTION GMBH

+ Impact

The introduction of the developed short-distance transporter has the potential to bring about a change in mobility behaviour on shopping trips and to improve the environment (walking and cycling, public transportation). Long-term and affordable availability of the means of short-distance transport will also ensure that goods can be supplied to those groups of the population who do not have access to a car.

⚙ Implementation

The project was completed at the end of April 2015 and a mock-up of the short-distance transporter produced. Negotiations are currently ongoing with an Austrian retail chain; a test store should be equipped with short-distance transporters in 2016.

Contact:

Harald Frey, Vienna University of Technology, Institute of Transportation

Partners:

Institute for Ecological Urban Development, University of Applied Sciences Upper Austria, aka buna design consult – Dr. Bernhard Rothbucher e.U.

Project duration: 09/2013 – 04/2015

Research staff:





GREENCITYHUBS

Last-mile delivery logistics with multiple hubs as well as alternative vehicle and drive technology

The project involved developing a concept for sustainable inner-city delivery logistics on the basis of inner-city distribution centres and vehicles powered by alternative drives. Setting up inner-city transshipment points (city hubs) should reduce the length of the actual delivery trips and make it easier to use alternative vehicle technologies and drive systems.

A model-based development and optimisation of the technical, geographical and logistical aspects of the problem led to the development of a generally valid model and a workable approach to the problem for each of the three sub-areas. The findings were taken up and implemented by the field partners through a structured implementation recommendation for logistics companies and through integration and visualisation in a web-based platform.

+ Impact

Taking into a consideration a "mixed fleet" approach (conventional HGV on longer rounds, alternative drives on shorter, mostly inner-city rounds) as well as existing delivery depots, which can be supplemented with further city hubs, allows the valid simulation of various scenarios, which also enables the derivation of interesting findings in the direction of decision-related additional costs for reducing emissions.

Implementation

The developed concept was documented within the scope of a practical implementation recommendation; the results were also presented in an interactive visualisation tool. The platform is intended to function as a prototype for a future tool aimed at supporting the decision-making process. Due to industry-related development trends (compression of parcel service networks in urban areas), both the developed methodology as an integrated procedural model for consulting practice and the decision-making support tool in application have great practical potential.

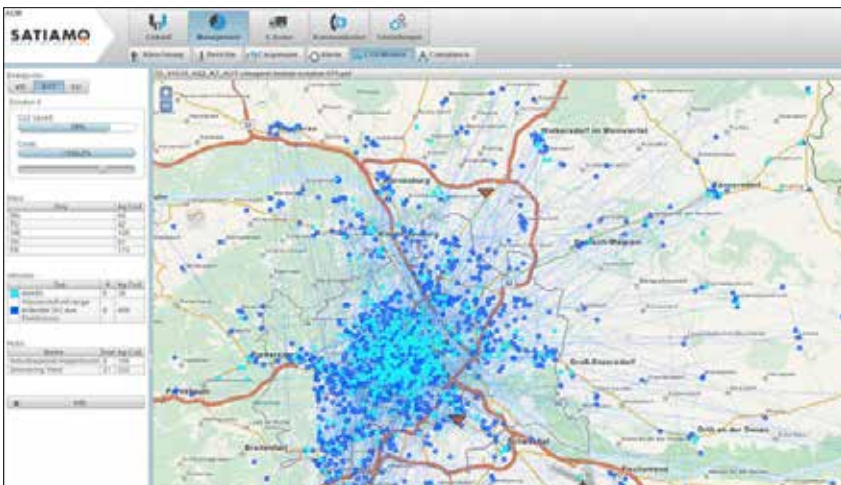


Figure: Software prototype

At present, a trade-off has to be found between logistics costs and environmental emissions: the conversion of individual trips to alternative propulsion systems - especially electric vehicles - can make an important environmental contribution with fairly low additional costs relatively quickly. With a sufficient number of delivery rounds, transshipment points within a city - the CityHubs - become interesting, which in turn significantly reduces the total number of kilometres driven on the last mile.



Bartosz Piekarz, i-LOG Integrated Logistics GmbH

Contact:

Bartosz Piekarz, i-LOG Integrated Logistics GmbH

Partners:

tbw research GesmbH, Vienna University of Technology - Institute for Powertrains and Automotive Technology, SATIAMO GmbH, University of Vienna - Institute for Business Administration

Project duration: 10/2014 - 03/2016

Research staff:

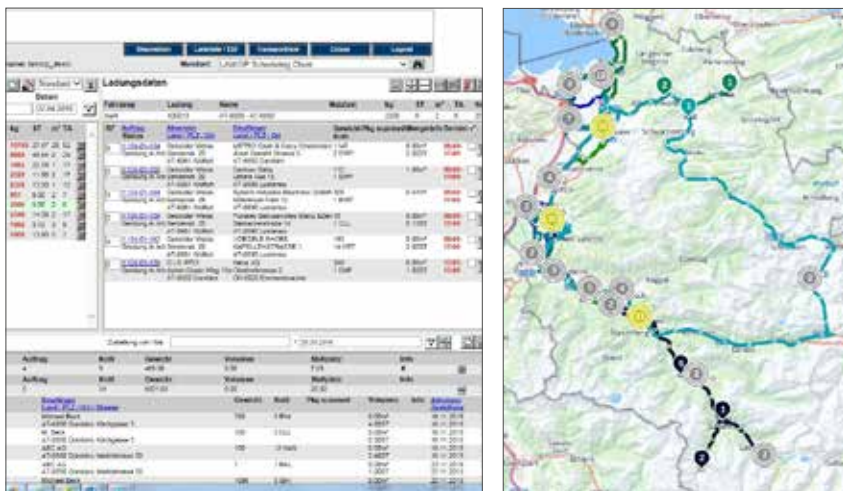




LAMIOP Last Mile Optimisation

A parcel service company delivers hundreds of consignments to recipients every day and collects just as many from shipping agents. So far, the improvements have focused on optimising the route of a single vehicle. Over the course of the project, this selective optimisation was replaced by overall optimisation, i.e. no longer is the round of a single HGV optimised but rather the rounds of all of a location's HGVs are optimised jointly in order to achieve an overall optimum situation.

To this end, the project involved the use of a heuristic to develop a systemic optimisation algorithm capable of carrying out the overall optimisation of routes and rounds for an entire branch office. This systemic algorithm was then tested in a software prototype.



Figures: Software solution

// A heuristic for the systemic optimisation of the first/last mile of parcel service companies was successfully developed and tested during the project. By increasing efficiency in the utilisation of short-distance transport vehicles and optimising the routes driven, cost savings of 10% were achieved in the tested scenarios. In parallel with this, the reduction in the number of kilometres driven also resulted in a sharp drop in the emission of pollutants. **//**



Andreas Pichler, Gebrüder Weiss Gesellschaft m.b.H.

+ Impact

The reduction in the distance driven and the increase in the level of utilisation reduce pollutant emissions, especially in urban areas. At the same time, cost savings and the increase in the quality of timeliness contribute to the boosting of competitiveness at Austrian parcel service companies.

Implementation

The algorithm is currently on trial at a branch office of Gebrüder Weiss. A roll-out to further branch offices is planned. inet logistics has implemented the algorithm in its software product "inet Transport Management System" and will offer this to its customers in future as an additional functionality. The software prototype is ready. A roll-out at Gebrüder Weiss and at customers of inet logistics will take place in 2016/2017.

Contact:

Andreas Pichler, Gebrüder Weiss Gesellschaft m.b.H.

Partners:

"inet"-logistics GmbH, Fachhochschule Vorarlberg GmbH

Project duration: 06/2013 – 03/2016

Research staff:





SUSTAINABLE SOLUTIONS FOR "FIRST/LAST MILE"

FOOD4ALL@HOME

Nationwide home delivery of everyday items

The goal was to develop a modern last-mile logistics concept for the nationwide, on-time and cost-neutral supply of fresh food. The basic idea was to use the efficient (and thus low-cost) standard processes of parcel service providers and their competence of nationwide delivery (every day, every door) for food deliveries as well.

The developed concept is based on the intensive cooperation of a specialist in the food sector (Pfeiffer HandelsgmbH, Unimarkt) and a company with the core competence of nationwide home delivery (Österreichische Post AG). Thanks to the close linking of the processes and IT systems of both partners, the orders can be picked in a Unimarkt outlet and then fed into the standard processes of the Austrian post company (Österreichische Post AG) as finished parcels. Important aspects of this were the passive cooling of the goods and thus the use of special, reusable containers. It is not the vehicle but the container which is cooled, which therefore becomes a "simple package". This ensures that the fresh food can be kept cool for 48 hours.



Figure: Project team

+ Impact

The project leads to reductions in emissions (elimination of private transport, especially in rural areas) through the bundling of quantities or transport (compared to single trips) and ensures that goods are supplied to people with physically or temporarily restricted mobility.

Implementation

The concept was expanded to the whole of Austria upon completion of the project in April 2015. Austrian households can place their orders in the online shop of Unimarkt Handelsgesellschaft m.b.H. & Co. KG from Monday to Friday before 4.00 pm and have them delivered by Österreichische Post AG the following day (same day in Linz).

Contact:

Efrem Lengauer, University of Applied Sciences Upper Austria

Partners:

RISC Software GmbH, Österreichische Post AG, Pfeiffer HandelsgmbH

Project duration: 09/2013 – 02/2015

Research staff:





Figure: Project team

“ The pilot run showed that all three user groups – shippers, logistics providers and consumers – were able to generate the expected benefit. Online trading gives Unimarkt another business field, Österreichische Post AG is expanding its range of services and has established an industry standard with its passively cooled box, which we are now offering across Austria and is also offered by other food shippers. And consumers profit from the convenient delivery of fresh food to their homes – even without having to be there in person. ”



Peter Umundum, Österreichische Post AG

“ Food4all@home was a great research project for me because it ended up being implemented. Thanks to this project, it is now possible to order fresh food online and have it delivered to your door, right across Austria. I am particularly proud that Food4all@home has since been awarded two prizes: with the Spring Award 2015 of bmvit and FFG as well as the Austrian Logistics Prize 2015 of VNL in the category “Best innovative logistics solution”. ”



Marika Kellermayr-Scheucher, University of Applied Sciences Upper Austria



INTERMODAL HUBS

TETRANET

Terminal-based transport network for industrial enterprises

The project investigated the potential innovative role of an inland terminal, not only as an interface for intermodal transport but also as a catalyst for better utilisation of the rolling stock.

The goal of the project was to considerably optimise the transport of bulk goods through new technologies and above all a new logistics approach as well as to focus on the service concept. To this end, a simulation model for calculating the potentials for increasing efficiency was developed by incorporating a terminal into an intermodal logistics network. At the St. Michael terminal, the project partners are designing and simulating such a network for supplying important industrial enterprises in Upper Styria with raw materials from the area of bulk goods, which is intended to deliver both efficiency gains and an increase in system stability.



Figure: innofreight containers

“ It was possible to design an efficient supply network for the raw materials of leading enterprises in Upper Styria and to prepare it for implementation. It enables the ageing rolling stock to be renewed and organised more efficiently. Innofreight’s InnoWaggon is designed as a waggon for universal use. It can replace the outdated waggons with suitable containers. This enables the mobile equipment to be utilised considerably better than at present. To this end, containers are also stored temporarily in the terminal as a more affordable component of the logistics service. ”

Hannes Pichler, INNOFREIGHT Speditions GmbH

+ Impact

The project contributes to ensuring the supply of Austrian industrial enterprises that make intensive use of raw materials. It enables the shifting of transport from road to rail and in doing so reduces emissions. The efficient organisation of the last mile by means of triangular routes contributes to the avoidance of empty trips.

Implementation

The developed concept can be used to further develop a specific logistics offer and serve as a starting point for a control system.

Contact:

Hannes Pichler, INNOFREIGHT Speditions GmbH

Partners:

University of Natural Resources and Life Sciences, Vienna - Institute of Production and Logistics

Project duration: 05/2013 – 06/2016

Research staff:





KANBAHN

Capacity analysis and development of operating strategies for multimodal railway access points

This project involved the development of a simulation tool that makes it possible to test risk-free operating strategies and the resulting capacity and quality behaviour of multimodal railway access points.

The project made it possible to successfully combine the know-how from the previous SimConT and SimShunt projects into an improved simulation model. Several transshipment modules and necessary shunting operations can now be simulated together and synchronously in a single model.

The result is a comprehensive simulation tool for analysing strategic, tactical and operational problems in rail-road container terminals. The modelling of layout quantity configurations and track-side processes enable the early detection of resource, process and decision-related bottlenecks and their impact on the operational procedure of combined transport terminals.

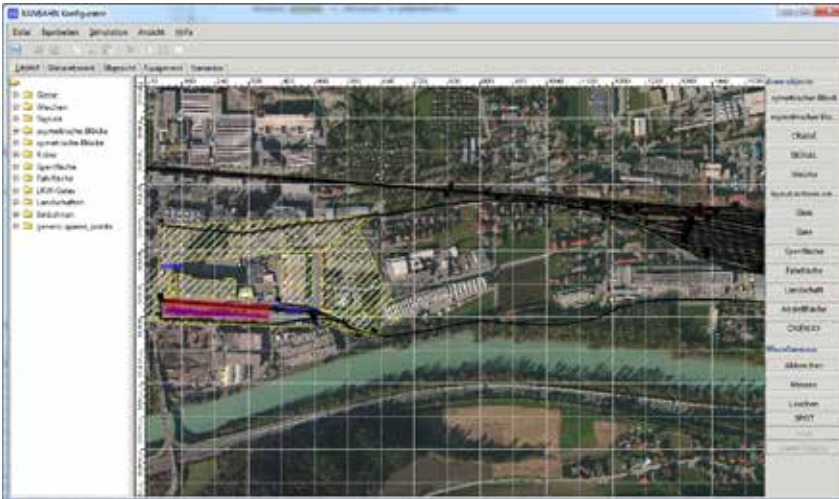


Figure: Software prototype

// The developed simulation tool integrates the processes of goods terminal and marshalling yard. This enables the extensive analysis of location-specific infrastructure projects and the resulting transport in advance as well as the need for transport equipment and load carriers. The result is a considerable increase in investment certainty. **//**



Manfred Gronalt, University of Natural Resources and Life Sciences, Vienna - Institute of Production and Logistics

+ Impact

The project contributes to increasing the proportion of goods transport by rail and reduces the levels of HGV traffic across the country.

Implementation

Considerations of practical application and further development of the simulation tool are already in the development phase.

Contact:

Manfred Gronalt, University of Natural Resources and Life Sciences, Vienna - Institute of Production and Logistics

Partners:

ÖBB-Infrastruktur Aktiengesellschaft, h2 projekt.beratung KG

Project duration: 10/2013-12/2015

Research staff:





TRIUMPH II

Trimodal Port Transshipment Point II – Efficient flow through digital networking

Part of the project involved developing an intelligent data exchange platform that enables the digital networking of all players in the intermodal transport of goods, from the loader via the logistics service provider, the HGV haulier, the container terminal and the railway undertaking (RU), to the shipping company and consumer.

The self-learning system developed in a preliminary project for the purpose of calculating the arrival forecast for container ships and HGVs was further developed with features such as the connection to intelligent traffic systems and services such as the Donau River Information Services (DoRIS) of viadonau. Deviations are dynamically determined and made available as information to everyone involved in the process of the intermodal/trimodal transport chain. Building on this, all cross-modal, collaborative processes such as the loading of empty containers at the loader, container transshipment and storage at the port as well as the coordinated planning of the subsequent transport processes can be optimised.



Figure: Trimodal port transshipment point

/// At many transport and transshipment companies, communication with business partners continues to be in paper form, unstructured emails or telephone calls. Only a very few use sophisticated IT systems integrated with the important partners. Data can be easily exchanged with partners in digital form through the intelligent communication hub. The real time data this additionally makes available (position of the means of transport, traffic situation) can now be used to calculate arrival forecasts for inland ships and HGVs, which in turn can be used in delivery and dispatch for better planning of the transshipment processes. The improved sorting of containers with a minimum of service lifts (pre-marshalling problem) leads to container transshipment processes that are much more efficient in terms of energy and cost. Sustainable savings of between 17 and 22% are possible. **///**



Karin Kainzinger, Ennshafen OÖ GmbH

+ Impact

The central customer benefit of the system lies in the transparency of intermodal transport chains and the simplified communication between the stakeholders. This results in an increase in efficiency at the loading points and transshipment hubs due to better coordination and proactive event management, which in turn should increase the attractiveness of intermodal transport processing and lead to goods traffic being shifted to environmentally friendly modes of transport.

Implementation

The concept of intelligent data access control was implemented on the basis of user needs analyses and related modified processes (process redesign) as well as by means of innovative approaches in the areas of intermodal data access conditions and data exchange standards.

Contact:

Oliver Schauer, University of Applied Sciences Upper Austria

Partners:

AIT Austrian Institute of Technology GmbH, CTE Container Terminal Enns GmbH, Ennshafen OÖ GmbH, GS1 Austria GmbH, RISC Software GmbH, via donau – Österreichische Wasserstraßen-Gesellschaft m.b.H.

Project duration: 10/2013 – 10/2016

Research staff:





INTERMODAL HUBS

INNOTRAIL

Organisation and technology-based location development concept for the terminal at Hall in Tirol

For the terminal at Hall in Tirol, a location development concept was developed which uses interdisciplinary analyses to harmonise market strategy, transshipment concept and storage organisation by taking local factors into account.

Intra- and inter-regional potentials were evaluated in a holistic analysis of the possibilities specific to the location. Starting from the current situation, a relational analysis was carried out in which the transport potential was surveyed, augmented with an optimised operating concept and tested for consistency by means of a capacity analysis. The result is a representative catalogue of solutions with organisation and technology options for developing the location of the intermodal terminal.



Figure: Terminal at Hall in Tirol

// The results of the interdisciplinary analysis show a potential to increase the transshipment capacity of up to 80%, without a proportional expansion of the terminal's size. **//**



Alex Wolf, Tiroler Straße-Schiene-Umschlaggesellschaft m.b.H., terminal director

+ Impact

The project makes a contribution to maintaining and developing the transport offering for combined transport in the intra-Alpine Austrian economy area and to increasing the share of goods transport on the railways.

Implementation

The results are used for the location development of the terminal at Hall in Tirol.

Contact:

Manfred Gronalt, University of Natural Resources and Life Sciences, Vienna - Institute of Production and Logistics

Partners:

h2 projekt.beratung KG, Econsult Betriebsberatungsgesellschaft m.b.H., Tiroler Straße-Schiene-Umschlaggesellschaft m.b.H.

Project duration: 06/2014 – 11/2015

Research staff:





RTM-0

A digital partnership for managing capacity in the transport of goods by rail

The project concerns the development of a capacity management software for the digitally coordinated supply chain, from the handover point of the shipping customer to the acceptance point of the recipient.

The innovation represents the cross-company planning of resources between a railway undertaking (Rail Cargo Austria AG) and the industrial customer (OMV). The utilisation of the railway undertaking's train systems is optimised in direct coordination with the industrial customer in a cross-company IT platform and in collaborative processes. Customer sending and receiving processes are intelligently intermeshed and coordinated vertically and horizontally with central production processes. The common goal is better utilisation of the existing rail capacity from the Schwechat refinery to the respective local dispatch warehouse.

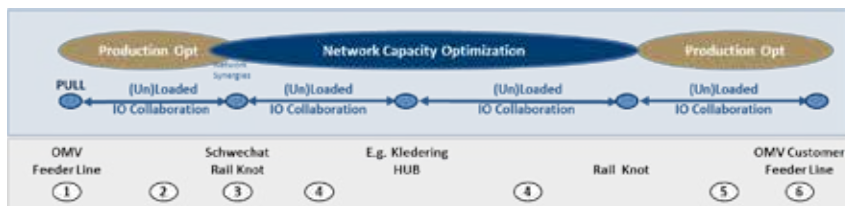


Figure: The bullwhip effect is eliminated by transforming the rail logistics operation from the PUSH to the PULL principle

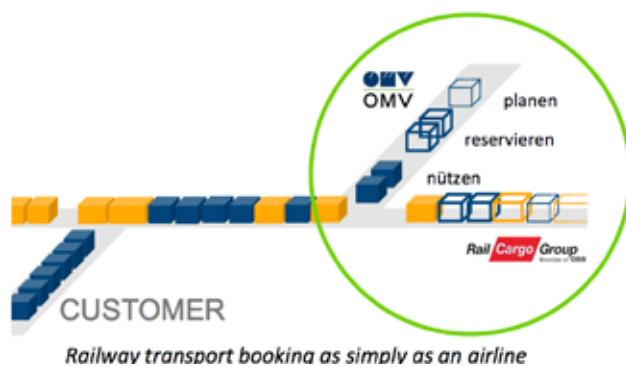


Figure: The customer needs prediction leads via automated capacity collaboration to the continuously predictive adjustment of resources

/// The project will improve the planning and execution of the goods transport, eliminate the bullwhip effect in the railway network and thus also increase the efficiency of both companies in the areas of logistics and production. ///



Erwin Flieh, Rail Cargo Austria AG,
Christian Herneth, OMV Refining & Marketing GmbH

+ Impact

The project develops "Business Capabilities", which leads to a better utilisation of available production facilities and rail infrastructure, simplifies the provision of freight waggons as a means of transport and increases the resilience of the transport chain.

Implementation

The development of the sought-after desktop demonstration is complete. The prototype will be developed in the follow-on RTM-0 expansion project. The project results will be implemented in 2017 in a real environment in the plant area of the company OMV in Vienna Lobau and at the interfaces between OMV and the railway undertaking RCA.

Contact:

Erwin Flieh, Rail Cargo Austria AG,
Christian Herneth, OMV Refining & Marketing GmbH

Partners:

Institut für Integrierte Produktion Hannover gemeinnützige Gesellschaft m.b.H.,
RISC Software GmbH, OnTec Software Solutions AG

Project duration: 09/2014 – 10/2015

Research staff:





SUSTAINABLE TRANSPORT CHAINS AND NETWORKS

CINDERRAILER

Network of polygonal transport for the combination of slag and gypsum transport with the same containers

The project involved developing innovative logistics chains in rail transport for bulk goods such as granulated slag, gypsum, gravel and substitute fuels, which has previously ruled out the use of the same equipment.

The solution is based both on the use of innovative transport technologies and on a new logistical and organisational approach. The transport performed to date as point-to-point transport without return freight will be merged into a transport network for which solutions for coordinating the companies involved were sought in addition to the flexibly deployable modular equipment and planning of sophisticated schedules and transshipment times.

Customers can be shown the advantages of the system with the results of the demonstration on building up transport networks and deploying equipment to them.



Figure: InnoWaggon and RockTainer system

// The result of the project is a system that can be positioned on the market as a new product. The knowledge gained is used to offer the customer a functioning system that delivers logistical advantages and can be employed as a model for further implementations. In this way, new markets and customers can be acquired, especially abroad.**//**



Martina Zisler, INNOFREIGHT Speditions GmbH

+ Impact

The project increases the cost-effectiveness of the railways and at the same time reduces their emissions and consumption of resources. By avoiding empty trips, this can achieve higher loads, lower intrinsic weight and thus lower energy consumption per tonne kilometre of freight.

Implementation

The developed business model will be implemented in collaboration with customers from the construction materials and steel industry in Austria, where the combination of InnoWaggon and RockTainer system is used in the transport network of granulated slag, gravel and limestone. In the future, the use of this equipment should be tested in other branches of industry with transport of bulk goods and the system implemented. The further development of the currently used RockTainer ORE to the newly dimensioned RockTainer SAND is also planned for mid-2016.

Contact:

Martina Zisler, INNOFREIGHT Speditions GmbH

Partner:

Rail Cargo Austria AG

Project duration: 07/2014 – 12/2015

Research staff:





INNOSTEEL II

Increasing the quality and efficiency of steel transport through goods waggon monitoring and data aggregation

The use of innovative IT and goods waggon monitoring systems is intended to lead to an increase in the efficiency and quality of rail-based special transport in the steel industry and subsequently to rail-appropriate logistics services in other branches of industry.

Building on the exploratory study, the project worked on the automatic analysis and linking of data from various sources, e.g. from the innovative monitoring of transport by means of sensors mounted on freight waggons as well as the data obtained from rail and logistics service providers (waybills, timetables, etc.). The project focused on the analysis and targeted prediction of alarms (e.g. moisture hazard) and the optimisation of turnaround times. This leads to a reduction in idle times and the associated effects on the necessary total stock of freight waggons (potential for reducing the stock of waggons).

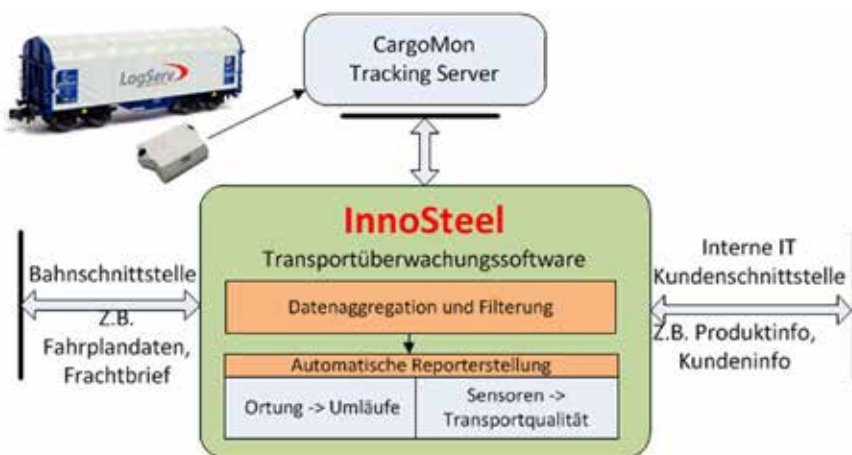


Figure: Linking of data from various sources

|| The innovation lies in finding the right links, analysis and forecasts in a flood of information from various transport monitoring data sources. The aim is to supply compressed information targeted at logistics service providers, suppliers, and recipients (similar to the principles of "Big Data"). **||**

Stefan Mahlknecht, CargoMon Systems GmbH

+ Impact

The project has the potential to achieve increased cost efficiency by optimising utilisation, which in turn leads to an improvement in the competitiveness of the transport service provider. At the same time, CO2 emissions are reduced and the improved quality of the transport contributes to the safeguarding of the location.

Implementation

Important sub-results, such as the periodic automated reports, have already been put into productive operation at the application partner.

Contact:

Stefan Mahlknecht, CargoMon Systems GmbH

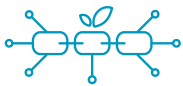
Partner:

Logistik Service GmbH

Project duration: 06/2014 – 12/2015

Research staff:





SUSTAINABLE TRANSPORT CHAINS AND NETWORKS

ROUTEComASSISTANCE

Optimising transport chains through organisational and technical incorporation of ICT for train drivers

The goal of the project was to develop an IT system that supports train drivers in their work and increases the flow of information along the transport chain by actively involving the train drivers in it.

Potentials were methodically determined and evaluated on the basis of detailed analyses of the train driver function and its role in the process, the legal framework conditions and the flow of information. The analyses and potentials were prepared according to a specification for the IT implementation of RouteComAssistance with the goal of generating future added value. On the basis of this specification, the system was implemented in the form of a prototype and validated in the context of a pilot trial.

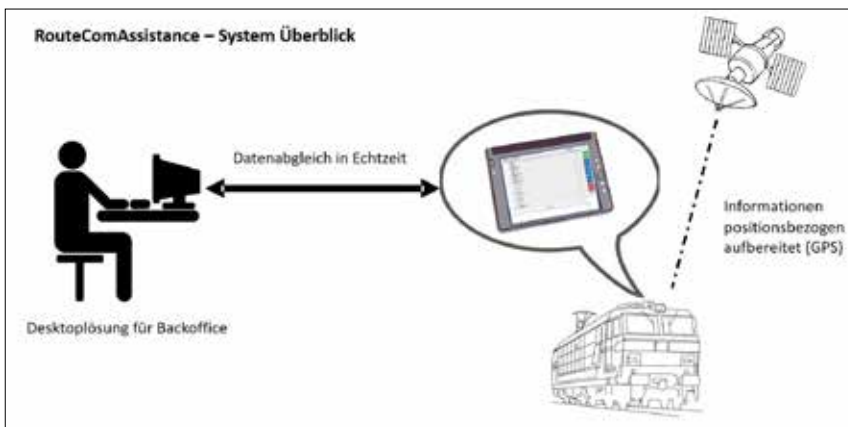


Figure: RouteComAssistance system overview

// Infrastructure operators were also involved in the project because they make important information available about train journeys. This information used to be only in paper form or electronically in PDF format, but the infrastructure operators are working on options for making electronic data interfaces available for the transfer of safety-related information. The RouteComAssistance system has already been optimised in this regard on the basis of information about these developments. **//**



Christian Studnicka, MEV-Austria GmbH

+ Impact

The system enables a reduction in emissions from diesel traction by adapting the driving behaviour of train drivers or a reduction in energy consumption for electrical traction. In addition, an appropriate flow of information also permits an increase in the quality of the transport service, thereby ensuring that goods are supplied on schedule.

Implementation

The RouteComAssistance system has been developed as a prototype. The project partners are still working on the system. The focus is primarily on implementing it into regular use with the project partner MEV-Austria GmbH. All train drivers as well as the employees who work in the back office of MEV-Austria should work with the system in future. The development should subsequently be offered as a marketable product to railway undertakings.

Contact:

Konrad Röthel, TECHNOMA Technology Consulting & Marketing GmbH

Partners:

Independent Railway Services GmbH, Symbionis Software, Skills & Technologies GmbH

Project duration: 08/2014 – 01/2016

Research staff:





SUSTAINABLE TRANSPORT CHAINS AND NETWORKS

ILKÖ

Integrated logistics network for Combined Transport in Austria

ILKÖ aims at developing an integrated logistics network for rail freight transport with a focus on Combined Transport (CT) in Austria.

Building on the requirements definition, an integrated, customer-focused, Austria-wide logistics network is being designed which consists of a backbone of regular train connections (in special consideration of market-orientated timetable concepts) and an integrated door-to-door logistics service. Furthermore, an innovative software architecture for the integration and utilisation of all relevant data has been developed. In this context, a demonstration model has been implemented as an online tool for querying CT connections. This has created an important basis for subsequent practical implementation.



Figure: CT on the main leg, source: Jos Denis

// In connection with the commercial development of the described door-to-door logistics service, a new business field can be created in the areas of logistics and IT. From the perspective of the logistics service providers involved (railway undertaking as well as haulier and/or terminal operator), the prospect of generally increased demand for transport services in Combined Transport is particularly relevant. **//**



Ingrid Glauninger, Montan Speditionsgesellschaft m.b.H

+ Impact

The results promise to make a contribution to enhancing and strengthening the competitiveness of what is at present a far from competitive offer in national Combined Transport and in doing so make a contribution to strengthening energy-efficient and resource-conserving rail freight transport and/or Combined Transport. At the same time, they promise to make a contribution to a prosperous development of the liberalised rail sector (terminals, railway undertaking) in Austria.

Implementation

The developed offer concept and the demonstration model are still being discussed with external stakeholders and tested for practicability. The results should be implemented in a subsequent project.

Contact:

Andreas Käfer, Bernhard Fürst, Traffix Verkehrsplanung GmbH

Partners:

c.c.com Andersen & Moser GmbH, Salzburg AG für Energie, Verkehr und Telekommunikation, Montan Speditionsgesellschaft m.b.H., LTE Logistik- und Transport-GmbH, Wiener Lokalbahnen Cargo GmbH

Project duration: 07/2014 – 06/2016

Research staff:



Other cooperative R&D projects still in process:



SUSTAINABLE MOBILITY OF GOODS IN CITIES

EAGLE

Development of an automated goods unloading system

Consortium: Graz University of Technology – Institute of Logistics Engineering, Österreichische Post AG, TAGpilot GmbH

LOMACRO+

Local marketplace for Crowddelivery+

Consortium: evolaris next level GmbH, Vienna University of Technology – Center for Transportation Systems Planning | Department of Spatial Planning, Fuhrwerk Logistik GmbH, EN GARDE Interdisciplinary GmbH, Mitteregger, Dr. Mathias



SUSTAINABLE SOLUTIONS FOR "FIRST/LAST MILE"

CCONT

Cooperative – Container-Trucking

Consortium: FTW Vienna Telecommunications Research Centre, Interlogistik GmbH, AIT Austrian Institute of Technology GmbH, Ilse Kral Transport Company, Naber EDV-Dienstleistungs- und -Handels-OG



INTERMODAL HUBS

OPTIHUBS

Optimising logistical processes at multimodal hubs for hydrophilic types of goods by the example of the port of Vienna

Consortium: Vienna University of Technology – Department of Spatial Planning, University of Applied Sciences bfi Vienna, NAST Consulting ZT GmbH, TINA International GmbH, Wiener Hafen GmbH & Co KG



SUSTAINABLE TRANSPORT CHAINS AND NETWORKS

CARGO2GO

Innovative two-stage supply concept for urban spaces independent of load units and modes of transport

Consortium: University of Natural Resources and Life Sciences, Vienna – Institute of Production and Logistics, University of Natural Resources and Life Sciences, Vienna – Institute for Transport Studies, h2 projekt.beratung KG, Gerhard Zoubek Vertriebs KG, Heavy Pedals Lastenradtransport und -verkauf OG, BergsTopp GmbH

SMARTBOX

Small goods mobility 2.0

Consortium: netwiss OG, promotion&co Florian Podroschko, FH St. Pölten Forschungs-GmbH, Vienna University of Technology – Institute of Transportation, University of Applied Sciences Upper Austria, Österreichische Post AG, CHEP Österreich GmbH, KEBA AG

RTM-O ERWEITERUNG

Rail Transport Mobility Optimisation Expansion

Consortium: Rail Cargo Austria AG, Institut für Integrierte Produktion Hannover GmbH, OMV Refining & Marketing GmbH, OnTec Software Solutions AG, RISC Software GmbH

STELLOGISTICSYSTEMS

Modular logistics system for the industrial logistics of semi-manufactured and finished goods of the steel industry

Consortium: innofreight Speditions GmbH, CONTAINER PROIZVODNO PODJETJE, d.o.o., Technical University of Graz – Institute for Railways and Transport Industry

ICIIT-TFM

Intelligent cargo infrastructures for intermodal transport chains – Transport Management Framework

Consortium: Traffix Verkehrsplanung GmbH, Montan Speditions GesmbH, Satiamo GmbH, Gebrüder Weiss Gesellschaft m.b.H.

IPPO

Intelligent networking of forecast, planning and optimisation for designing sustainable transport chains

Consortium: Fraunhofer Austria Research, Hödlmayr International AG, RISC Software GmbH

ENTKURO

Automated decoupling process for marshalling yards

Contact: University of Applied Sciences Upper Austria, ÖBB-Infrastruktur Aktiengesellschaft, Fachhochschule St. Pölten ForschungsGmbH, AIT Austrian Institute of Technology GmbH, Ulbrich Maschinenbau- und Export-Import Vertriebsg.m.b.H.

4. Exploring. Sounding out.

Apart from research and development projects, exploratory studies are also supported in Mobility of the Future. They serve to prepare for research, development and innovation projects. In particular, they aim at sounding out the feasibility of possible future projects. This allows projects to be evaluated in advance and analysed in terms of their potential. If potential is identified, exploratory studies often lead to cooperative research and development projects; if not, at least the knowledge base of the topic is expanded.





SUSTAINABLE MOBILITY OF GOODS IN CITIES

URBANLOADING

Loading zone management in urban spaces

The goal was to design a system for innovative loading zone management and to analyse possible operator models for this system.

The project investigated three variants of the innovative loading zone management system in urban spaces: a legally regulated loading zone management system in urban spaces: the opportunity of the law-based regulated loading zone control, the ability of cooperative loading zone management, as well as the option of the occupancy information for loading zones. The solution approaches were tested in consideration of legal, technical, organisational and economic aspects. Specifically, the sub-components of reservation/booking, generation of information, provision to road users and control/enforcement were examined. Specifically, the sub-components of reservation/booking, generation of information and provision to road users, as well as control/enforcement were examined. An operator model was developed on this basis of the outcome.



Figure: Urban loading zone

// The project is supported by efficient sensor technologies which could be used, by legally permissible implementation options (evaluated for both the public and private sectors) and the inclusion of end user requirements in a further development process. It is already likely that the information-based approach will need to be incorporated into a future implementation. **//**



Melanie Mayrhofer, PRISMA solutions EDV-Dienstleistungen GmbH

+ Impact

The exploratory study contains recommendations on optimal use of the limited number of loading zones through coordination options for the city, cost and time savings for the hauliers and companies, and increased traffic safety for all road users. Emissions of pollutants and the consumption of resources should be reduced in the future by avoiding unnecessary search traffic during delivery and collection of goods.

Implementation

The results of the exploratory study serve as the basis for future decisions about a market-ready system solution for realising the mentioned benefit. The knowledge gained about the possibilities for designing a loading zone management system will be used to prepare a subsequent project.

Contact:

Melanie Mayrhofer, PRISMA solutions EDV-Dienstleistungen GmbH

Partner:

EBE Solutions GmbH

Project duration: 06/2015 – 05/2016

Research staff:





SUSTAINABLE MOBILITY OF GOODS IN CITIES

GEWERBELOGISTIK

Business and logistics models for supporting small enterprises and traders

The goal of the project is the development and evaluation of sustainable business and logistics models for small enterprises and tradespeople, with practical application for carpentry firms in Lower Austria which make deliveries in Vienna and have to deliver and collect materials, tools and people within the scope of their normal business activity.

Taking into consideration the strategy of the city of Vienna as well as current and potential legal requirements for city logistics, knowledge for the development of innovative logistics models for small enterprises and trade firms was built up in an interdisciplinary approach comprising "Logistics Management", "Supply Chain Management" and "City Logistics". This also involved taking into consideration technological (sustainable fleet, etc.) and organisational aspects (logistical processes, performance indicators, operator and profit-sharing models, etc.). The developed models were then tested against the real requirements and expectations of specific study partners (carpentry firms and logistics companies in Lower Austria) and adapted accordingly.



Figure: Urban logistics

// Closer cooperation and a merger of several small enterprises and tradespeople is the basic requirement for the success of an optimal logistics model for transport to the city. //



Miguel Suarez, Vienna University of Economics and Business - Institute for Transport and Logistics Management

+ Impact

Implementation could relieve the existing transport infrastructure, which would have positive effects on the environment. Small enterprises and tradespeople could profit from lower investments and costs in the area of transport.

Implementation

There is currently little interest on the part of tradespeople and logistics service providers to implement logistic solutions for optimising transport to the city. On the one hand, the lack of trust of the companies involved is the most frequent reason why such solutions fail; on the other, the wide dispersal of delivery points, the high number of unsuccessful deliveries due to the absence of the recipient and the expected flexibility when setting delivery time slots are all relevant reasons that significantly reduce the economic effectiveness of transport outsourcing.

Contact:

Miguel Suarez, Vienna University of Economics and Business - Institute for Transport and Logistics Management

Partners:

Ing. Karl Picker e.U., Quehenberger Logistics GmbH

Project duration: 01/2016 – 12/2016

Research staff:





SUSTAINABLE TRANSPORT CHAINS AND NETWORKS

BAKURO

Coupling robots for marshalling yards

The exploratory study investigated how the uncoupling of goods waggons in a marshalling yard can be automated, because the standard coupling (screw coupling) used in Europe when transporting goods by rail can at present only be screwed together and uncoupled manually.

This difficult task should be solved with the aid of sensors and innovative handling technology. To this end, the process of uncoupling was divided into two independent steps. The first step is the so-called "lengthening" (= unscrewing of the coupling), which involves loosening the coupling by means of a screw mechanism and disconnecting the brake hoses. The second step is the actual removal of the coupling hook from the train hook, the "uncoupling". In many marshalling yards, this second step is performed as the train rolls slowly past the shunter before it actually rolls off onto the sorting sidings. In order for this to be done by machines in future, the basic conditions were clarified for both steps, the requirements and options for railway operation were formulated, and aspects of employee protection investigated. Solutions for the necessary mechanisms and sensors were designed on the basis of this, both for the "lengthening" and for the "uncoupling".



Figure: Screw coupling

// The innovation arises from the fact that there is no such system in existence and that coupling procedures have so far only been performed manually. The technical innovation lies in the use of state-of-the-art sensors and their algorithms in conjunction with innovative mechanical constructions. **//**



Burkhard Stadlmann, University of Applied Sciences Upper Austria

// ÖBB see this project as an important component of their digitisation and automation strategy for goods transport. The use of the latest technologies is intended to increase both product quality and transport speed. This automated processing is another step on the path to Industry 4.0. **//**



Florian Saliger, ÖBB-Infrastruktur AG

+ Impact

A coupling robot is a modern solution that fills an important gap in the automation of marshalling activities. At the same time, the safety of marshalling employees increases and the productivity and quality of the roll-off operations are improved.

Implementation

A European patent has been applied for on the basis of the results. A prototype for the uncoupling system is currently being constructed in the follow-on project - EntKuRo. Upon successful completion of the project, the system can be used in all large marshalling yards of ÖBB Austrian Railways.

Contact:

Burkhard Stadlmann, University of Applied Sciences Upper Austria

Partners:

AIT Austrian Institute of Technology GmbH, FH St. Pölten Forschungs GmbH, ÖBB-Infrastruktur AG

Project duration: 07/2014 – 06/2015

Research staff:





TRUCKAERO

Variable body geometry for goods vehicles

As part of the exploratory study, a semi-trailer with lowerable body was designed and simulated in detail in CFD; a functional prototype was also produced for the purpose of performing test drives to determine the real fuel-saving potential.

Heavy goods vehicles exhibit relatively high drag due to their unfavourable aerodynamic vehicle shapes, especially at high speeds over long distances. The aim is to reduce this by using a technology that allows the outer contour of the goods vehicles and their trailers to be varied. The application of a variable geometry for semi-trailers by means of four hydraulic cylinders integrated into the rear stanchions, which are fed by a hydropneumatic unit, makes it possible for the outer contour to be changed to a more aerodynamically favourable shape when the vehicle is running empty or if the full transport volume is not needed. If the entire transport volume of the semi-trailer is needed, the outer contour can be set to the conventional (box-shaped) form to enable use of the entire load volume. The benefit of this system is that it also functions in a powerless or decoupled state.

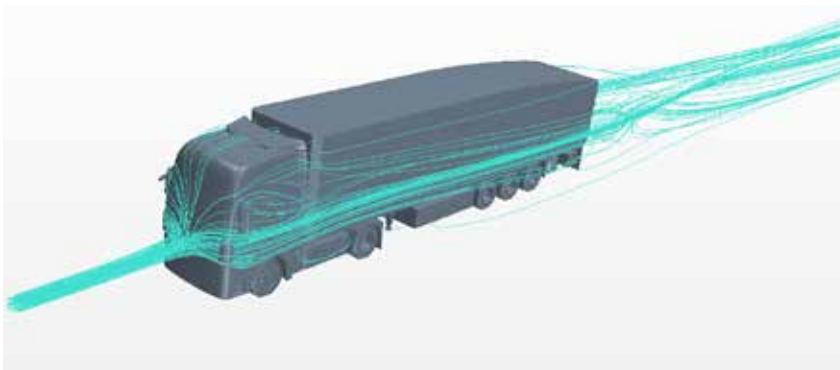


Figure: Semi-trailer with lowerable body in the CFD simulation

|| The simulation results gave a potential saving in terms of fuel consumption of approx. 5%, which would mean an average fuel reduction of approx. 1.5 litres per 100 km when using a long-distance articulated lorry. **||**



Jürgen Fabian, Graz University of Technology - Institute of Automotive Engineering

+ Impact

The variable geometry offers the potential to reduce drag and thus to lower fuel consumption, while contributing to an increase in transport efficiency.

Implementation

The functioning prototype has been produced. Typing and test drives are scheduled for late summer 2015.

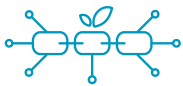
Contact:

Jürgen Fabian, Graz University of Technology - Institute of Automotive Engineering

Project duration: 07/2014 – 06/2015

Research staff:





SUSTAINABLE TRANSPORT CHAINS AND NETWORKS

ÖKO-LOG

Sustainable delivery of regional food

The exploratory study investigated how the supply chains of regional food from producers (e.g. organic farms) to consumers (e.g. restaurant trade, organic shops, private households) can be made more sustainable. Individual deliveries that used to be made mainly by passenger car or lorry should be combined and shifted to an intermodal transport chain made up of public transport, private goods transport and cargo bikes for last-mile distribution.

A concept for the service was created on the basis of discussions with experts, stakeholder interviews, focus groups and customer surveys. This contains information on goods logistics, the necessary IT system, the requirements for food hygiene and labour law as well as the financing of the service. In a field test in July 2015, food parcels were transported from Weiz to Graz with the ÖBB-Postbus and a motor vehicle trailer and then delivered to households in Graz by cargo bike.



Figure: Cargo bike used in the field test

|| The field test involved testing two intermodal supply chains ("Regional bus - Cargo bike" and "Lorry trailer - Cargo bike") in practice. The complete distribution chain from producer to consumer was carried out and simultaneously documented. Although more than ten internal and external stakeholders were involved (e.g. Loderhof Weiz, ÖBB-Postbus, lorry driver, dispatcher, Pink Pedals bike couriers, several private households, etc.), the transport ran without a hitch. The goods arrived intact and punctually at their destination. **||**



Julia Zientek, Forschungsgesellschaft Mobilität - Austrian Mobility Research - FGM-AMOR gemeinnützige Gesellschaft m.b.H.

+ Impact

The results offer the potential to reduce traffic as well as to lessen noise and other negative effects of motorised traffic. Benefits such as new jobs in the region are also expected at regional level.

Implementation

The aim is to implement this concept in the Graz region as part of a demonstration project. Strategic partnerships are still being sought.

Contact:

Margit Braun, Forschungsgesellschaft Mobilität - Austrian Mobility Research - FGM-AMOR gemeinnützige Gesellschaft m.b.H.

Partners:

LEVI - Lebensmittel-Erzeuger-Verbraucher-Initiative, EUC Energie- und Umweltconsulting DI. Gerfried Cebrat e.U., BikeCityGuide Apps GmbH

Project duration: 09/2014 - 08/2015

Research staff:





SUSTAINABLE TRANSPORT CHAINS AND NETWORKS

SYNCHAIN

Synchromodal logistics chains

In the exploratory study, the transport concept of synchromodality was examined in depth in order to understand which conditions are needed to make general and successful use of this trendsetting transport concept on the one hand, and on the other to identify which conditions (still) have to be created in Austria in order to have all necessary prerequisites in place.

While in selected cases a significant shifting of transport from road to rail and to inland waterways can already be observed in the BeNeLux countries, the concept of synchromodality deployed for this is still (almost) entirely unknown in large parts of Europe – including Austria. The goal of the exploratory study was to understand the (relatively new) concept of synchromodality and amongst others things to also identify which key enablers exist and are necessary in order to implement synchromodal logistics concepts. Building on this, it was examined which of these key enablers have already been implemented in Austria and which still need to be implemented.

// Synchromodality can be seen as a further development of the concepts of multi-, co- and inter-modality. In contrast to these already well established concepts, it is important for synchromodality to always be defined on a network. These concepts are also expanded by the aspect of real-time decision making: It is therefore possible to review a previously taken modal decision at any time – including while the transport is underway – and to replace it with a better one. **//**



Matthias Prandtstetter, AIT Austrian Institute of Technology GmbH

+ Impact

Synchromodality leads to a significant shift towards environmentally compatible modes of transport due to the possibility of a real-time change between different modes of transport.

Implementation

Based on the findings, the preparation of ongoing research projects is underway.

Contact:

Matthias Prandtstetter, AIT Austrian Institute of Technology GmbH

Partner:

University of Applied Sciences Upper Austria

Project duration: 11/2014 – 10/2015

Research staff:





SUSTAINABLE TRANSPORT CHAINS AND NETWORKS

GO2PI

Ways of implementing the Physical Internet

On the basis of the theories of the Physical Internet (PI) and the practical example of an Austrian business case, both technical as well as informational and procedural criteria were investigated and guidelines laid down for the development of a service provider neutral and open business model for distribution logistics.

The development of a method for identifying and implementing the requirements and criteria of PI was pursued on the four levels of Assets, Processes, Information & Data Flow and Business Models. Actual processes and data were used for an integrated analysis of the framework conditions, criteria and limitations and transformed into co-opetition guidelines for future operational implementation. To date, no appropriate assistance has been available to producing companies for the implementation of visionary PI concepts. The research project highlighted the current limits of what is immediately feasible, outlined the overall implementation paths needed and defined further research topics for the implementation of PI.

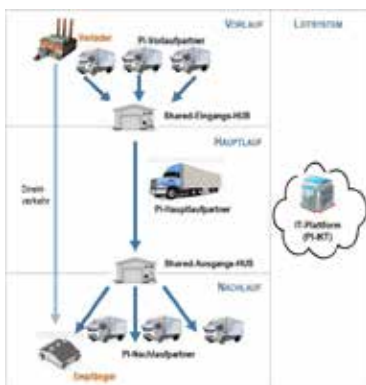


Figure: Transport scheme

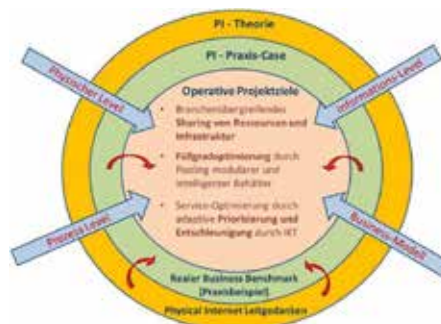


Figure: Process model

Initial practical examples from the field of international PI research and industrial project partners show that the overall potential for a reduction in transport journeys through bundling is estimated at more than 10% on the basis of the surveyed volume flows. This applies both to long-distance as well as groupage and distribution transport in the partial load and parcel segment, and primarily to small and medium-sized hauliers and freight forwarders. The established transport industry is therefore expressing great interest to the Go2PI project partners about the developments and design of the Physical Internet. Above all, the specialist group of Upper Austrian hauliers has already launched informational and motivational events about PI in collaboration with the Logistikum research and education institute of the University of Applied Sciences Upper Austria.

+ Impact

The bundling enables a reduction in the number of delivery runs, which has positive effects on the environment, while also achieving cost savings.

Implementation

Initial sub-areas for optimising load carrier management are being implemented at the project partner ASPÖCK and giving rise to process-specific savings. Although existing disposable containers cannot be quickly replaced in the industrial companies observed for current reasons of cost, the correctness of the postulated PI approach towards PI reusable containers has been confirmed and documented as a result. Together with the IT service provider and project partner SATIAMO, the project involved identifying and codifying future ICT prerequisites and necessary PI transactions that are yet to be standardised in subsequent projects but are already flowing into the software developments.

Contact:

Hans-Christian Graf, University of Applied Sciences Upper Austria

Partners:

Graz University of Technology – Institute of Logistics Engineering, SATIAMO GmbH, Aspöck Systems GmbH

Project duration: 07/2015 – 06/2016

Research staff:



Hans-Christian Graf, University of Applied Sciences Upper Austria



ASB-COMBIHUB

The hybrid use of existing railway sidings as intermodal hubs for Combined Transport

The goal of the exploratory study was to identify railway sidings (private sidings linked to the public rail network) that are suitable for the transshipment of containers from the perspective of spatial planning and to analyse them with regard to the use of innovative transshipment technologies. Another goal was to present the conditions that railway sidings have to fulfil for such transshipments and their associated establishment as intermodal hubs for Combined Transport.

The results of a GIS analysis were used to perform a comprehensive classification of all branch line locations and to categorise them into priority target areas. Building on this, locations that appear highly suitable over the course of desk research were investigated more closely in terms of their specific infrastructural circumstances.

In parallel to the GIS analysis, 15 innovative and 7 conventional transshipment technologies were surveyed and analysed in a secondary research project in terms of their suitability for use on railway sidings.

+ Impact

The potential of the exploratory study lies in the shifting of road transport to environmentally friendly rail transport and on the efficient use of existing infrastructures.

Implementation

No branch line operators have so far been found to implement this concept. This is because of the anticipated high costs, which will arise not only from infrastructure investments but also from operating costs and the risk of converting existing logistics systems.

Contact:

Konrad Röthel, MA, TECHNOMA Technology Consulting & Marketing GmbH

Partner:

Traffix Verkehrsplanung GmbH

Project duration: 08/2013 – 07/2014

Research staff:



Figure: Potential transshipment locations

// Railway sidings that exhibit a high degree of potential were explored, but the external transshipment of combined transport is extremely problematic for safety reasons. However, increased use of the existing railway sidings and a shifting of internal transport to the railways is entirely realistic and desirable in those places where suitable volumes and a counterpart for the rail transport are available. **//**



Konrad Röthel, TECHNOMA Technology Consulting & Marketing GmbH



SMARTHUBS 2.0

Optimisation of multimodal hubs in Corridor VII (Danube Corridor)

The exploratory study macroscopically investigated the effectiveness and efficiency of the overall transport system and microscopically investigated the use of existing and planned transshipment areas for freight transport and its resilience in terms of disruptions in accordance with an optimal coordination of different logistical processes at multimodal hubs.

In terms of micro- and macro-economic effectiveness and efficiency, multimodal hubs show high optimisation potential which partly arises from the overall logic of the transport system and requires a holistic approach.

In terms of optimising procedures at multimodal hubs in the future, suitable and quantifiable indicators will be needed which also enable the comparison and measurement of problem-based optimisation strategies on a macroeconomic and microeconomic level. To ensure this, a benchmark system was developed. Involved stakeholders as well as their various requirements and objectives were identified. Eventually, success factors were derived and analysed by considering (1) hub-specific system properties, (2) common operating models and (3) strategy papers on transport and economic policy.



Figure: Diagram of Smart Hubs 2.0, source: Vienna University of Technology - Department of Spatial Planning, Center for Transportation Systems Planning



Figure: Port of Duisport of 10.11.2014, source: Alessandra Angelini

// Interesting are especially those optimisation potentials which cannot be highlighted by using conventional methods from an operational perspective, but can by considering a macroeconomic approach. The developed benchmark system can be used during the optimisation process to take into account the overall logic of the transport system by using indicators and making them measurable and comparable when evaluating (required) on-site developments. //



Georg Hauger, Vienna University of Technology - Department of Spatial Planning, Center for Transportation Systems Planning

+ Impact

Efficient use of the required resources as well as optimal planning and organisation of transport procedures have the potential to improve resilience and increase utilisation of the modes of transport used at multimodal hubs and along the transport chain. The developed benchmark system can be used to highlight the performance and capacity as well as problems and any bottleneck of multimodal hubs, and provides statements on equipment and competitiveness.

Implementation

The developed benchmark system provides the basis for designing an innovative simulation model which will be programmed for the first time within the scope of the cooperative R&D project "optihubs". Eventually it is possible to take spatial factors at multimodal hubs into account and to optimise procedures of logistical, operational and administrative nature on site.

Contact:

Georg Hauger, Vienna University of Technology - Department of Spatial Planning, Center for Transportation Systems Planning

Partners:

NAST Consulting ZT GmbH, TINA International GmbH, University of Applied Sciences bfi Vienna

Project duration: 06/2013 – 07/2014

Research staff:





INTERMODAL HUBS

IMPALA

Intermodal hubs as urban logistics centres

The aim of the research was to explore the extent to which urban intermodal hubs such as inland ports or rail terminals are suitable as urban logistics centres using electrically powered delivery vehicles for regional fine distribution and which areas still have a need for research and development.

For that purpose, application scenarios were defined with the involvement of possible future users and the relevant stakeholders. During the research, the following two application scenarios were investigated in detail:

- Distribution of food with consolidation in the Port of Vienna and
- Deliveries to restaurants in the city centre by boat incl. subsequent fine distribution

The investigations revealed that the implementation of a logistics centre at an intermodal hub (e.g. the Port of Vienna) is possible and meaningful on the basis of the infrastructure that is usually available, such as warehouses, handling and storage areas.



Figure: Possible transshipment locations in Vienna

// In most cases, intermodal hubs are found in central locations with excellent transport infrastructure, which allows a large proportion of regional fine distribution to be performed in inner city areas using electrically powered vehicles. The research showed that approx. 75% of the delivery trips have a length of less than 85 km and therefore fall within the range of current battery technology. **//**



Jürgen Zajicek, AIT Austrian Institute of Technology GmbH

+ Impact

The implementation of the developed concepts induces more efficient and environmentally compatible delivery in cities for an improvement in the quality of life of inner-city residents; it also enables more effective processing of the delivery trips due to the smaller number of vehicles using the road network.

Implementation

Based on the highly promising results, great interest in the use of intermodal hubs as logistics centres was expressed by small and medium-sized enterprises (SMEs). Further implementation remains possible but is not yet planned.

Contact:

Jürgen Zajicek, AIT Austrian Institute of Technology GmbH

Partners:

Econsult Betriebsberatungsgesellschaft m.b.H., TINA International GmbH, Wiener Hafen GmbH & Co KG

Project duration: 06/2014 – 03/2015

Research staff:





INNOVATIVE TRANSPORT MEANS AND MEDIA

INNOSTEEL

Increasing the quality and efficiency of steel transport by means of goods waggon monitoring and data aggregation

The exploratory study investigates the increase in the efficiency and quality of rail-based special transport in the steel industry through the use of innovative IT and goods waggon monitoring systems.

Targeted solutions that supply information about transport routes, delays and current events should be developed through the aggregation, filtering and linking of various data sources and by involving various areas in the application partner's company. The idle and inactive times of the goods waggons should also be reduced through improved scheduling in the maintenance management system. Linking data from basic sensors with knowledge about the specific properties of the goods being delivered should provide high-quality information about the transport quality, which makes it possible to accelerate the turnaround times of goods waggons through efficient monitoring.



Figure: Loading the coils

// An important gap in the system currently in use is that only planning information for the transport can be used in the entire process between loading in the finished goods warehouse to arrival at the customer. The whereabouts of waggon and train number can only be actively requested from the respective railway undertaking on a case-by-case basis. The transport, the nature of the goods and the arrival time at the customer therefore form a "Black Box" in the process. **//**

Joachim Piehl, Logistik Service GmbH

+ Impact

The research has the potential to lead to a reduction in the time spent on transport monitoring, better transport quality using goods waggons as a mode of transport and better utilisation of the goods waggons. This improves the competitiveness of the transport service provider, reduces CO2 emissions and strengthens Austria as a business location.

Implementation

The results of the research were implemented in the R&D project Innosteel II.

Contact:

Stefan Mahlknecht, CargoMon Systems GmbH

Partner:

Logistik Service GmbH

Project duration: 09/2013 - 12/2013

Research staff:





INNOVATIVE TRANSPORT MEANS AND MEDIA

KOMBIFLEXWAGGON

Feasibility study for modular quick-load waggons for the efficient loading and unloading of semi-trailers

The aim of the research was to take the idea of the innovative rolling stock waggon for the horizontal loading of HGV semi-trailers that cannot be moved by crane and subject it to a technical and operational examination.

In terms of content, the exploratory study comprised the technical design, analysis and development of the Kombi-Flex Waggon, a competition analysis and a demand analysis. The results of these three project elements were finally compiled into an overall operating efficiency analysis.

The technical concept provides for the trough of the waggon to extend sideways on extendible and height-adjustable booms. The lorry positions the semi-trailer on the trough and uncouples. Finally, the trough is retracted and locked to the base frame, while the semi-trailer is held in position by a support coupling. The investigation into operating efficiency shows high potential for the market. The premises of the potential end users are that the marketable solution must make do without expensive infrastructure investments and not exceed the price of the current long-distance HGV transport when in operation.



Figure: Rolling stock waggon for horizontal loading

// Based on the current development status, a Kombi-Flex Waggon with two loading areas has a total weight of around 70 tonnes. Trailers with a load of approx. 22 tonnes can therefore be transported with a theoretical utilisation of 80% and 27 loading areas in each direction. Depending on the relation to continuous long-distance HGV transport, this gives a saving of between 4% and 8%. **//**



Christopher Hutter, Cargo Flex Rail OG

+ Impact

The waggon, a "Made in Austria" innovation, is intended to give logistics service providers quicker and more efficient access to combined goods transport, strengthening Austria as a business location and increasing the appeal of the railways.

Implementation

The system is currently being tested for technical feasibility. The research was nominated for the RIZ Genius Ideas Prize 2014 – Category "Technology".

Contact:

Christopher Hutter, Cargo Flex Rail OG

Partners:

Quehenberger Logistics GmbH, Vienna University of Economics and Business – Institute for Transport and Logistics Management

Project duration: 06/2014 – 03/2015

Research staff:





INNOVATIVE TRANSPORT MEANS AND MEDIA

RAKO-DONAUKANAL

Bike combi transport Danube Canal – Modern city logistics by water and bike

The exploratory study involved researching the intermodal combination of environmental friendly transport modes of waterway and cargo bike taking Vienna's Danube Canal as an example.

The resulting implementation model concentrates on the delivery of parcels to end consumers in an area extending up to three kilometres from the banks of the Danube Canal. The concept provides for parcels to be handed over from the existing parcel transport companies to the logistics system RAKO for the "last mile" under comparable conditions. That means an additional transshipment and handling of goods from the existing distribution warehouses in the vicinity of Vienna to the RAKO transshipment depot on the Danube Canal. At the transshipment warehouse in the Port of Vienna, the parcels are transhipped to interchangeable containers for bicycles by means of a sorting system. A hydraulic crane lifts the containers onto the transport boat, which then transports them to three mooring points along the Danube Canal. There, the containers are collected by a fleet of cargo bikes which perform the delivery to the end customers.



Figure: Delivery area of the system RAKO-Donaukanal

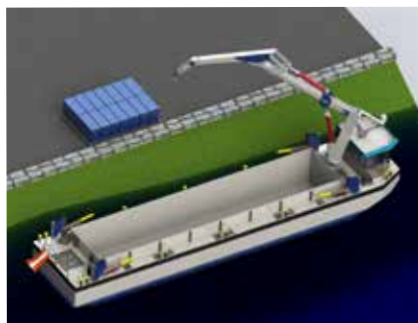


Figure: Illustration of the loading system of the transport ship, graphic: Anzböck

// The profitability analysis revealed that cost-covering implementation is fundamentally possible. The use of a diesel-powered boat and the associated greenhouse gas emissions is deemed critical. The possibility of using an electric boat is not recommended at present due to the considerable additional costs, the extra weight and the constant risk of short-circuit and fire. **//**



Reinhard Jellinek, Österreichische Energieagentur – Austrian Energy Agency

+ Impact

Implementation promises potentials in the direction of an increase in transport safety, reduced noise emissions, more road space, reduced road maintenance costs and greater energy efficiency.

Implementation

The exploratory study confirmed the proof of fundamental feasibility. While the use of an electrically powered boat remains out of reach, the implementation of a combined system with boat and cargo bike does not, however, appear expedient for achieving goods logistics with the lowest possible emissions.

Contact:

Reinhard Jellinek, Österreichische Energieagentur – Austrian Energy Agency

Partners:

Heavy Pedals Lastenradtransport und -verkauf OG, Forschungsgesellschaft Mobilität – Austrian Mobility Research FGM-AMOR gemeinnützige Gesellschaft m.b.H., Kanzlei Dipl.-Ing. Richard Anzböck

Project duration: 07/2014 – 11/2015

Research staff:





MOTOR VEHICLES FOR MOVING GOODS

MOVETHENUVE

Engine consumption, emission and thermal management measures for goods vehicles in inner-city transport

The project involved developing concepts for the further improvement of the goods vehicle engine with regard to the conflict of objectives between fuel consumption and emissions. Simulations were performed to evaluate the particularly critical load case of inner-city goods transport.

The goal was to evaluate future consumption, emissions and thermal management measures on the commercial vehicle engine by means of simulation. In doing so, the thermodynamic overall system was considered in specific consideration of exhaust gas treatment and on the basis of transient load profiles. Fuel consumption measures, a reduction of pollutants within the engine and thermal management of exhaust gases were analysed in this way. The strategies investigated included extended expansion, the Miller cycle and water injection.

A particular challenge in respect of the commercial vehicle engine is how to increase the exhaust gas temperature without causing a drop in the engine's efficiency. A high exhaust gas temperature is important for enabling the exhaust gas treatment system to function; good engine efficiency means lower CO₂ emissions.

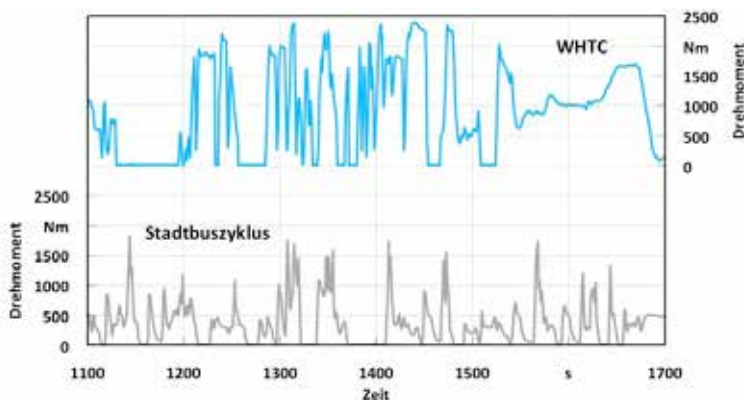


Figure: The real city bus cycle measured in this project is much less burdensome than the statutory WHTC test cycle and therefore poses a special challenge for operating the exhaust gas treatment system

// Amongst the innovative topics are the extended expansion and the water injection, both of which are currently still a long way off series implementation in commercial vehicles. One innovative method involves looking at the overall system of engine exhaust gas treatment under special consideration of transient thermal behaviour. This method is a prerequisite for a resilient evaluation of engine measures with regard to the described conflict of objectives. Particular importance was placed on the consideration of a realistic inner-city load profile, which was specially measured within the scope of the project. //



Eberhard Schutting, Graz University of Technology -
Institute of Internal Combustion Engines and Thermodynamics

+ Impact

The project offers a solution to the conflict of objectives between the customer-relevant saving of fuel (equivalent to a reduction in CO₂) and the statutory requirement for a reduction in pollutant emissions (primarily NO_x). Implementation would deliver clear improvements in fuel consumption and thus reduce CO₂ emissions.

Implementation

The results should flow into an ongoing concept study together with a leading industrial partner, as its implementation would represent an extraordinarily big leap in technology for the commercial vehicle engine.

Contact:

Helmut Eichl seder, Graz University of Technology - Institute of Internal Combustion Engines and Thermodynamics

Project duration: 08/2015 – 07/2016

Research staff:



Further exploratory studies currently in progress:



SUSTAINABLE MOBILITY OF GOODS IN CITIES

GUTZUFUSS

Small goods transport using active and sustainable forms of mobility

Consortium: netwiss OG, University of Applied Sciences Upper Austria, Vienna University of Technology - Institute of Transportation, IT-eXperience Informationstechnologie GmbH

MULE

Mobile multifunctional urban logistics platforms with electric drive

Consortium: Forschungsgesellschaft Mobilität - Austrian Mobility Research FGM-Amor gemeinnützige Gesellschaft m.b.H., EUC Energie- und Umweltconsulting DI. Gerfried Cebrat e.U., tbw research GesmbH, Graz University of Technology - Institute of Logistics Engineering, SCHEUWIMMER Fahrzeugbau GmbH, Graz University of Technology - Institute of Automotive Engineering



INTERMODAL HUBS

Q4

Quattromodal hubs - Scientific and practical relevance for the transport of goods

Consortium: Vienna University of Technology - Department of Spatial Planning, AIT Austrian Institute of Technology GmbH, University of Applied Sciences Upper Austria, University of Applied Sciences bfi Vienna - Courses: Europ. Economic and Corporate Management (EWUF), Banking and Financial Industry (BAFI), Project Management and Information Technology



NEW SERVICES THROUGH DATA GENERATED BY (COMMERCIAL) VEHICLES

IZMT

Intelligent status monitoring of engines in the transport

Consortium: AVL List GmbH, IPN Intelligent Predictive Networks GmbH

BENCHMARK TRANSSPED

Utilisation of data generated by vehicles in a benchmark tool for transport companies

Consortium: netwiss OG, MANOVA GmbH, Federal Branch Transport and Traffic, Freight Association, Hauliers Association, University of Applied Sciences bfi Vienna - Courses: Europ. Economic and Corporate Management (EWUF), Banking and Financial Industry (BAFI), Project Management and Information Technology

DATENVERKEHR

Real-time data use for the sustainable improvement of the traffic and environmental situation regarding the transport of goods

Consortium: nast consulting ZT GmbH, Vienna University of Technology - Institute for Powertrains and Automotive Technology, Vienna University of Economics and Business - Institute for Transport and Logistics Management



SUSTAINABLE TRANSPORT CHAINS AND NETWORKS

NALABISTA

Sustainability map for production & industrial locations, for the sustainable Mobility of Goods

Consortium: University of Applied Sciences Upper Austria, WIGeoGIS Softwareerstellungs- und Handelsgesellschaft m.b.H., Business Upper Austria - OÖ Wirtschaftsagentur GmbH
The two organisations WIGeoGIS Softwareerstellungs- und Handelsgesellschaft m.b.H., Business Upper Austria - OÖ Wirtschaftsagentur GmbH

You can find further details on current exploratory studies at www.ffg.at/verkehr (in German).

5.

Building up knowledge. Creating foundations.

Mobility of the Future creates foundations for future research and development projects through research and development services. Thus current technological developments, such as new vehicle technologies, Industry 4.0 and social developments, such as e-commerce, are being taken into consideration and their effects on the system of the transport of goods and the transport industry investigated. The results serve to broaden the knowledge base in this area and are included in the agenda setting of open calls.



INCOM-F

Austrian RTI competences at the interface between the transport of goods and logistics

The investigation identified the interfaces per se and subsequently (industry-) specific RTI competencies at the respective interfaces between the transport of goods and logistics in Austria. This was done by creating a link between theory and exploratory industry analysis. To this end, supply chains of varying complexity in the automotive, fresh produce, CEP services and material recycling industries represented the scope of evaluation. All interfaces identified in the individual industries were then merged across all industries in the form of a comprehensive matrix. This "RTI monitoring of interfaces" sorted by specific industries, arranged by vehicle, infrastructure and information interfaces, serves for the localisation and characterisation and consequently for the highlighting of deficits as a mean to derive RTI potentials. In order to utilise the derived RTI potentials for future open research calls, each of the identified interfaces was subjected to an evaluation of its relevance for the objectives in the Mobility of the Future programme and subsequently selected. In total, 57 industry-spanning, congruent interfaces were identified: 8 vehicle, 20 infrastructure and 29 information interfaces. The RTI potentials of the 14 highest-ranked interfaces were presented in more detail.

Contact:

Sandra Stein, Fraunhofer Austria Research

Partners:

University of Natural Resources and Life Sciences – Institute of Marketing and Innovation, Vienna University of Technology – Department of Spatial Planning, arp – planning.consulting.research

Final report (in German):

KV FTI

Combined transport of goods – Highlighting future potentials of research and innovation

The goal of the investigation was to develop a medium-term RTI catalogue for Combined Transport. In order to achieve this goal, a matrix of topics was elaborated with the stakeholders of the CT industry, which was mainly divided into two areas: "Hardware" and "Software". A high innovation potential was identified in the area of "Hardware", both in terms of lightweight construction (waggon and containers) and in terms of low-noise developments. With regard to containers, a trend towards "intelligent" containers can be ascertained. The increased integration of semi-trailers (which cannot be lifted by crane) into CT is also categorised as especially relevant.

New and innovative services are crystallising as a main point of focus for the existing potentials across the entire ICT area, the so-called "Software". Above all, data management, Open Data concepts as well as the use of energy self-sufficient telematics systems for localisation and status monitoring could deliver a boost to innovation here. The general thrust is the possibility of planning and controlling right along the supply chain. CT solutions should above all be developed together with the terminals.

Contact:

Alexander Chloupek, ABC Consulting

Partners:

GAHO-Consult GmbH, CombiNet – Combined Transport Network, Traffix Verkehrsplanung GmbH

Final report (in German):

EFLOG

Potential of the services of new vehicle technologies to impact on the offerings of logistics service providers

Based on various logistical operating functions, the R&D service first elaborated the preconditions for the transport of goods: How can parcel services, the supply of food retailers or industrial deliveries be presented? These goods deliveries face traffic on our road network in certain time windows on pre-planned routes. Such results should help to quantify the environmental benefits in terms of traffic and to constitute the transport-related logistical possibilities for realising reduction potentials. This exemplary, but realistic, data input was used to determine the input load requirements for the commercial vehicles used for the respective logistics task, in order to be simulated as trip cycles with the AVL programme Cruise in terms of fuel and energy consumption as well as CO₂-equivalent emissions. Such results should help to quantify the environmental benefits to traffic and to constitute the logistical possibilities for realising reduction potentials. On the basis of the trip cycle simulations of three sample transport runs with commercial vehicles of classes N1, N2 and N3, the aforementioned effects were calculated for 32 conventional, state-of-the-art diesel and natural gas (CNG) engines, for hybrids available on the market today or in the medium term, and for purely electrical drive configurations. These results were placed in relation to the fuel consumption and emissions values with the transport cost (measured against the vehicle weight) and with the transport service (measured against the conveyed payload), in order for them to flow into a sustainability-based concept of transport logistics performance indicators.

Contact:

Heinz Dörr, arp – planning.consulting.research

Partners:

AVL List GmbH, Vienna University of Technology - Department of Spatial Planning, Center for Transportation Systems Planning, Energycomment

Final report (in German):

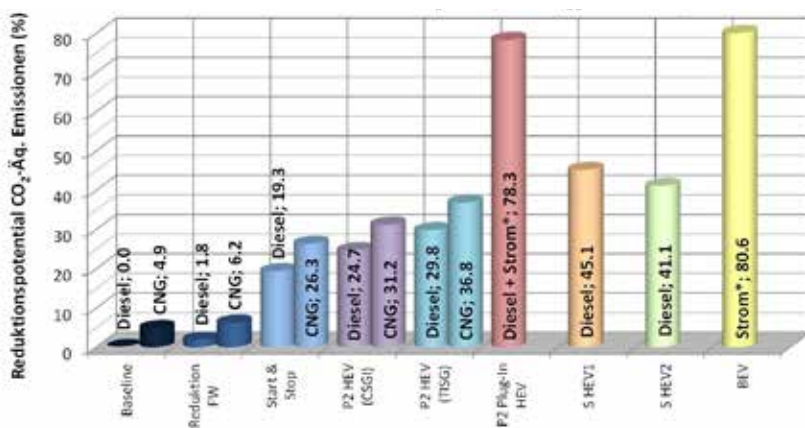


Figure: Fuel consumption potentials offered by new drive technologies by 2020

Notable reduction potentials were identified. They are between 19% and 39% just by installing a start-stop function in micro-hybrid vehicles. With full hybridisation, which allows a combination of conventional and electrical driving during the trip, up to 78% can be achieved, with the recuperation of electrical energy also making a contribution in urban traffic. In terms of potential savings, especially with regard to zero emissions, an electric commercial vehicle is unbeatable with regard to unrestricted use concerning range and performance, but still suffers at the moment from limited marketability. This is because the purchase costs of low-emission vehicles remain too high and cannot be realistically absorbed. Moreover, the present low price of oil should be used as a kind of "dividend" to drive forwards the transformation to the sustainable Mobility of Goods.

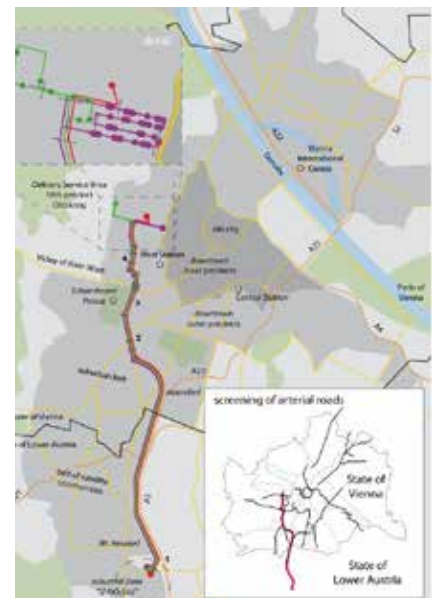


Figure: Reference route



Heinz Dörr, arp – planning.consulting.research

ECOMTRAF

Effects of e-commerce on the overall transport system

The positive development of e-commerce goes hand-in-hand with the increase in the number of delivered parcels (especially in the B2C segment). The effects of e-commerce on traffic can mainly be seen in two different areas: On the one hand, the transport volume of customers is changing due to online shopping; on the other, the use of parcel services is influencing the volume of CEP traffic. Impact models have been developed for this. These show that the positive effects of online trade depend heavily on the type of delivery, above all the possibility to combine delivery trips as well as the opportunities for customers to collect parcels in person. Same-day deliveries and narrow time slots are two of these developments that complicate combined deliveries and either increase the number of trips or reduce the number of parcels per trip. The CEP service providers are therefore required to use innovative concepts and organisational measures to counteract the load factor problem. On the other hand, neutral parcel stations in the vicinity of housing estates and apartment buildings help to increase the number of parcels per stop and enable the delivery of more parcels in the same amount of time. That increases both the load factor and customer benefit.



Figure: The number of parcels is increasing

// If you assume that an online purchase fully substitutes a shop-based purchase, then e-commerce even has a traffic-reducing effect. This is explained by the combined delivery of parcels by the CEP. If same-day delivery - or even 1-hour delivery - and individual delivery time slots gain in importance, this bundling effect is reduced and the effect reversed. The traffic load per parcel then exceeds the distance driven on a personal shopping trip. **//**



Efreim Lengauer, University of Applied Sciences Upper Austria

Contact:

Efreim Lengauer, University of Applied Sciences Upper Austria

Partners:

Herry Consult GmbH, Institut für Marketing - Strategieberatung GmbH & Co KG

Final report (in German):



AIDA-F

Potential interdisciplinary approaches for organisational innovations in the transport of goods

Given the acute challenges that are being triggered by the digital technology developments 4.0, climate change, environmental burdens in settlement areas or volatile economic dynamics, there is a need to organisationally expand interdisciplinary approaches in order to activate potentials for the beneficial and sustainable mobility of society and business. The Mobility of Goods was selected as a topic because it involves the interaction of technological innovation drivers from the worlds of industrial production, logistics and traffic technology in the carrier system. The aim was therefore to incorporate the assessments and experiences of specialists who render services in transport logistics and the supply of goods or who deal with such research in academic environments into the study in a kind of Delphi survey. Due to the advancing segmentation of fields of knowledge and the specialisation of job profiles, the understanding of system networking is tending to decline – despite digitisation – and unexpected system link-ups are manifesting themselves in problematic phenomena and complex interactions. As the transport of goods, procurement and sales logistics accelerate and burdens on the developed transport infrastructure and in its vicinity increase, such symptoms are generated because the deep-rooted efficiency increase of individual processes shifts the view to "systemological", i.e. system-wide, effects. A change in paradigm to an expanded utilitarian way of thinking therefore appears appropriate. Consequently, adapted interdisciplinary procedures and methods for combining organisational reforms to the transport of goods, all of which build on a foundation of scientific and theoretical findings of knowledge creation, are highlighted as part of a sustainable mobility system. The result should be a better understanding between technical, economic, natural science and humanistic disciplines for the joint accomplishment of tasks. The principles of sustainability, social intelligence, climate protection and environmental qualities give rise to such interdisciplinary objectives.

Contact:
Heinz Dörr, arp –
planning.consulting.research

Final report (in German):

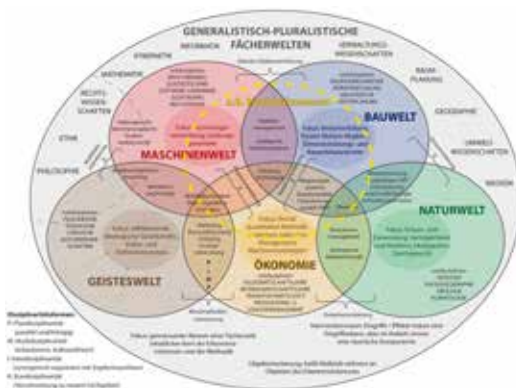
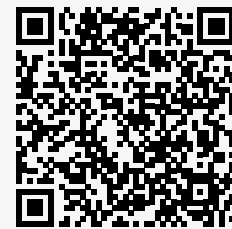


Figure: Railway specialisms

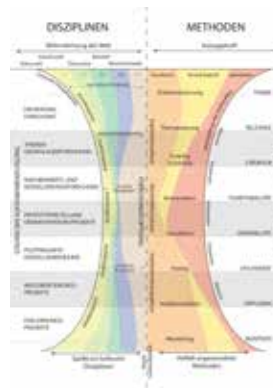


Figure: Research progress

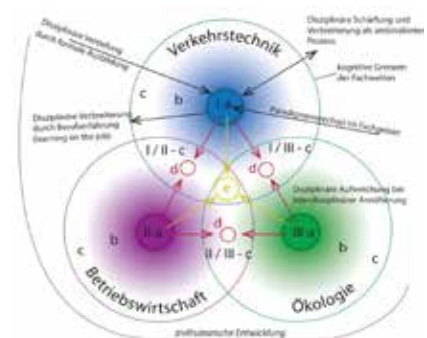


Figure: Disciplinary boundaries and interdisciplinary overlaps

// An awareness of the value and benefit of taking an interdisciplinary approach to the treatment of challenges facing the Mobility of Goods has only developed to a certain extent, which is why interdisciplinary results are still hard to come by. External stimuli are usually required to open up introverted specialist debates on the phenomena that occur, to motivate a collaborative accomplishment of tasks and as such to mobilise innovation processes. //



Viktoria Marsch, arp – planning.consulting.research

IND4LOG4

Industry 4.0 and its effects on transport logistics

Industry 4.0 refers to the digitisation of industrial production, which will bring about far-reaching changes in the field of transport and logistics. The R&D service investigates the effects of Industry 4.0 on the transport and logistics sector both from a practical and a scientifically based perspective, taking special consideration of Austria's external relationships. The investigation is intended to supply a suitable basis on which to elaborate different handling and strategy recommendations for RTI and transport policy.

Initial interim results highlight the importance of advancing the integration of the railway system into a digitised and/or automated future in the transport of goods and in transport logistics.



Figure: Increasing digitisation in the transport and logistics segment

// *The digitisation of production will have important impact on the transport and logistics industries in Austria. This is already happening due to the country's strong integration into international value creation chains, especially with Germany. In the area of logistics, cooperations with shipping agents and amongst logistics specialists themselves are becoming increasingly important.* **//**



Wolfgang Schwarzbauer, Oesterreichische Kontrollbank AG

Contact:

Wolfgang Schwarzbauer,
Oesterreichische Kontrollbank AG

Partners:

Vienna University of Economics and Business – Institute for Transport and Logistics Management, Vienna University of Economics and Business – Institute for Export Management

Interim report (in German):



GÜMOS

Guidelines for the development of RTI projects on the Mobility of Goods in cities

The past has shown that there are big challenges involved in the execution of research and development projects and in the implementation of research and development results in the area of the transport of goods and logistics, especially in cities. Obstacles include transitioning the development to the market and the fact that innovations are often only made possible through the interaction of various stakeholders. The number of such players in cities is particularly high. This further increases the already high levels of complexity that exist in logistics chains and complicates innovation.

For this reason, "Guidelines for the development of RTI projects on the Mobility of Goods in cities" have been developed which for the first time identify clear, measurable and assessable criteria that can be used for the development of research and development projects in the area of Mobility of Goods in cities and thus make it possible to manage the complexity that exists in the field of research.

Contact:

Norbert Sedlacek, Herry Consult GmbH

Partners:

Econsult Betriebsberatungsgesellschaft m.b.H., Schachinger Immobilien und Dienstleistung

Guidelines for the Mobility of Goods (in German):



Assessment tool for the Mobility of Goods (in German):



Figure: Guidelines for RTI projects in cities

“ Research and development projects in the area of Mobility of Goods in cities can only be successfully implemented when they build on the three key elements of successful city logistics right at the start of the project’s development: the operators of projects, the cities in which the projects are implemented, and the projects themselves. The guidelines and the assessment tool enable RTI project developers to identify weakness in the project’s design at an early stage. This increases the probability of the project being successfully implemented. ”



Norbert Sedlacek, HERRY Consult GmbH

WIFAS

The assessment of social impacts by funding programmes to support research in the mobility of people and goods

The goal of this research project was to develop the conceptual underpinnings in order to estimate programme-induced social effects of RTI programmes in the area of mobility of people and goods. The questions considered were (a) What kind of social impacts are associated with transport and mobility research and its results? (b) How can these social impacts be structured, and which indicators and methods should be used to identify (and assess) social impacts? (c) How can the programmes' contribution be estimated? As a result, two empirically-verified impact models were developed – one for the Mobility of Goods and one for personal mobility. The impact models should be used in future as the basis for estimating the social impacts of research funding programmes in the area of mobility.

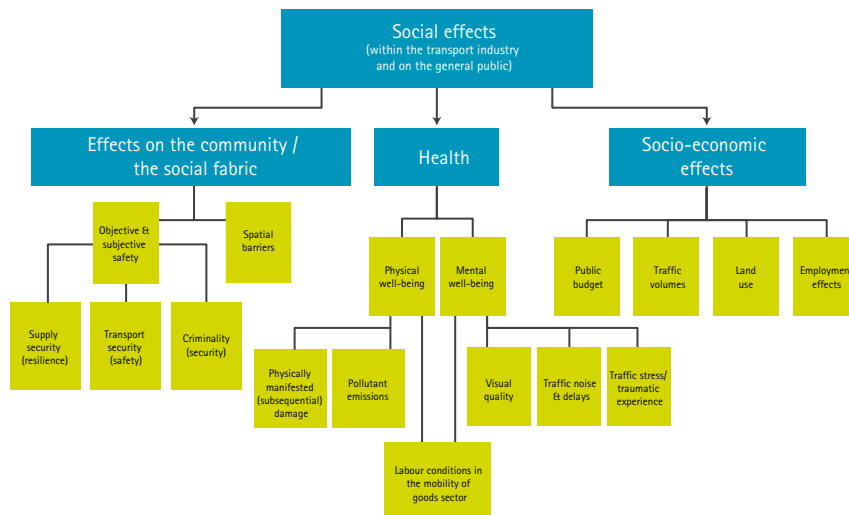


Figure: Impact model for the Mobility of Goods

II The WIFAS project laid the conceptual and empirical foundations for a comprehensive assessment of the social impacts of measures relating to personal mobility and the Mobility of Goods, which were previously covered in reduced form. This should now be used to factor in social effects in the project development phase and to investigate the actual social impacts of interventions after they occur. With a consistent implementation, Austria can adopt a pioneering position in Europe and beyond. **II**



Peter Kaufmann, Austrian Institute for SME Research

Contact:

Peter Kaufmann, Austrian Institute for SME Research

Partner:

netwiss OG

Final report (in German):



Impact model for the Mobility of Goods (in German):



Further R&D services currently in progress:

ACCIA

R&D potentials in the airfreight processes in Austria – Air cargo research and development capabilities in Austria

Contact: Heinz Dörr, arp – planning.consulting.research

Partners: DHL Globalforwarding, Flughafen Wien AG

TRACE

Identification of route choice decision criteria in road transport and preparation of a methodological manual

Contact: Georg Hauger, Institut für Verkehrssystemplanung HAUGER science:talk KG

Partner: nast consulting ZT GmbH

AUTOSTAT

Use of tracker/transponder technologies for official transport statistics

Contact: Elmar Fürst, Vienna University of Economics and Business – Institute for Transport and Logistics Management

Further Partners: Paradigma Unternehmensberatung GmbH, AUSTRIAPRO, Graz University of Technology – Institute of Highway Engineering and Transport Planning, Moser Transport GmbH

SERVICES TACHOGRAPH

Potentials of using the digital tachograph for integrated mobility services

Contact: Jürgen Zajicek, AIT Austrian Institute of Technology GmbH

Partner: Lichtenberger & Partner Solicitors

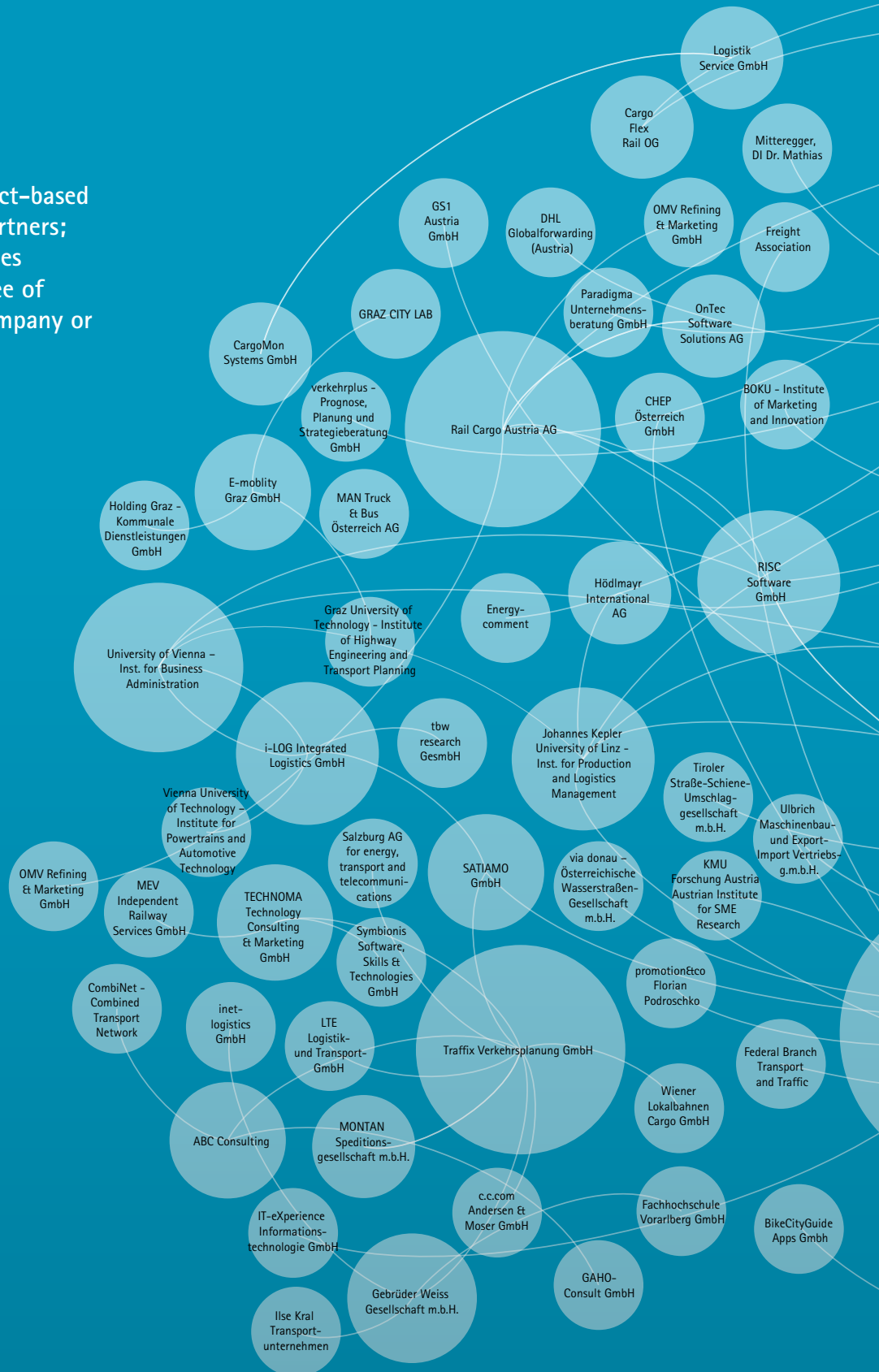
You can find further details on current R&D services at www.ffg.at/verkehr (in German).

6. Creating networks.

The national network of companies and research institutions that carried out RTI projects in the innovation field Mobility of Goods with the support of the bmvit from 2012 to 2016 are presented below.



The graphic shows the project-based connections between the partners; the size of the circles provides information about the degree of linkage of the respective company or research institution.



7. Cooperating across borders.



7.a. Transnational R&D projects

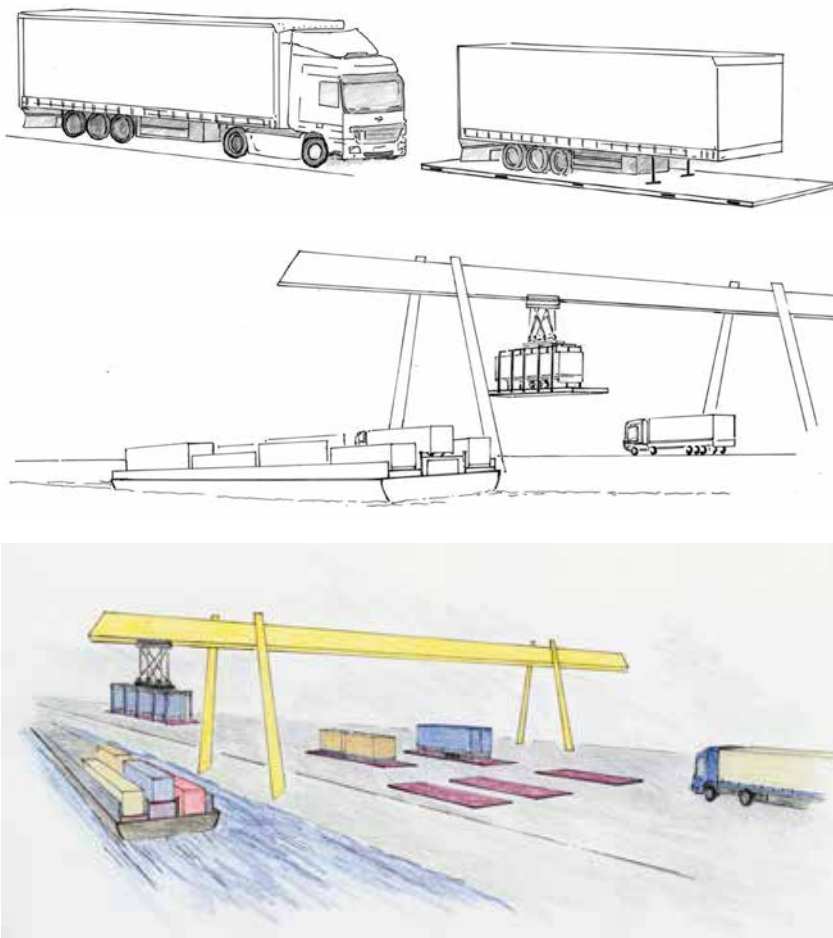
Since 2012, the bmvit has participated with Mobility of the Future in two transnational open calls in the area of the Mobility of Goods: once in the ERA-Net MARTEC (Maritime Technologies) and once in the ERA-Net Transport (ENT III) Flagship Call 2015 on Sustainable Logistics and Supply Chains. This resulted in a total of four projects with Austrian involvement being supported to the tune of EUR 1.25 million.



CEE-RIVERBRIDGE

CEE Riverbridge along the Rhine–Danube Corridor

The project aims at an innovative concept intended to move the transport of goods off the roads and onto inland waterways. The concept is noted for the integration of a shelving system onto a freight crane, on which different load units (e.g. containers, semi-trailers, HGVs) can be stacked. The system should be trialled for its economic and organisational feasibility in scheduled services on a section of the upper Danube.



Figures: Loading, source: RIGA

// Critical mass is often cited as an argument against shifting in discussions on the topic "Shifting to inland waterways". The establishment of a scheduled service that is technically unproblematic to participate in - even with small quantities - represents an essential step here. **//**



Matthias Prandtstetter, AIT Austrian Institute of Technology GmbH

Consortium:

AIT Austrian Institute of Technology GmbH (AT), SKILLZ - Strategie, Beratung, Beteiligung GmbH (AT), University of Applied Sciences Upper Austria (AT), RIGA-Garagen-Produktions & VertriebsgmbH, NAVROM (RO)



Focus of the open call:

MARTEC - Inland water and intermodal transport

Planned duration: 11/2015-06/2017

MULTISTRAT

Multimodal strategies for greener and more resilient wood supply

In most regions of Europe, seasonal capacity fluctuations in the wood harvest or wood transport as well as abrupt interruptions in the supply chain pose significant challenges for managing the supply of wood to industry, which is characterised by relatively constant seasonal demand. At the same time, the increasing frequency of natural disasters such as storms requires an increased buffer for the wood supply chain. This is where multimodal transport systems, which use HGV transport to make deliveries from the forest to the rail and port terminals, increase the buffer capacity while simultaneously reducing the emissions of the overall transport system.

Efficiency, resilience and sustainability of the supply chain reactions to disruptions are depicted and analysed in a supply chain model that supports the participative evaluation and implementation of the results. In addition a comprehensive presentation of regionally specific challenges, multimodal system capacities and management processes, the project approach relies on the direct involvement of managers in the testing, analysis and evaluation of innovative, multimodal systems. The elaboration of an integrated framework for the validation of multimodal innovations and adaptive strategies will make an important contribution to the development of an environmentally friendly and resilient wood supply in Northern and Central Europe



Figure: Extract of the wood terminal module of the simulation model

/// Multistrat will make an important contribution to the implementation of Green Logistics in forest-based industries and make the wood supply chain more robust when faced with supply risks. A renowned international team of researchers and the intensive involvement of industrial partners ensure the quality of the developed innovative solutions. ///



Peter Rauch, University of Natural Resources and Life Sciences, Vienna - Institute of Production and Logistics

Consortium:

University of Natural Resources and Life Sciences, Vienna - Institute of Production and Logistics (AT), Norwegian Institute of Bioeconomy Research (NO), Stiftelsen Skogsbrukets Forskninginstitut - Skogforsk (SE)



Focus of the open call:

ENTIII - Organisational innovations and new business models in logistic

Planned duration: 07/2016-06/2018

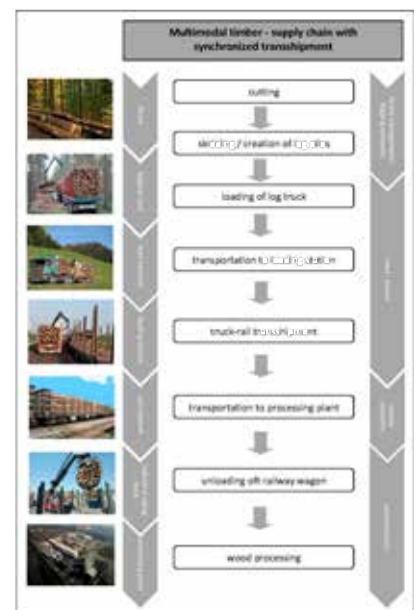


Figure: Supply chain

SAILOR

Smart last mile commerce

The goal of this project is the implementation of a service-orientated, organisational innovation by the name of SAILOR (Smart lAst mLe cOmmeRce). The SAILOR system improves the dynamic interaction between parcel delivery firms and customers by enabling more professional and coordinated decision-making on both sides. The goals of SAILOR are: (i) increased cost efficiency of the parcel delivery firms through a greater share of successful first-time deliveries and better management of returns logistics, (ii) a greater number of parcels accepted through flexible acceptance options in terms of time and place leading to customer satisfaction, and (iii) advantages for society such as the reduction of pollution in urban areas, less traffic congestion and less stressful labour conditions for employees of parcel delivery firms. Another goal is to verify a prototype and to evaluate the SAILOR business model after it has been implemented in four different demonstration cities in the EU. That can have political consequence in terms of an EU-wide solution for the logistics industry on the last mile.

// The SAILOR project has been specially designed to optimise the last-mile logistics of parcel services in order to save costs and to protect the environment. //



Klaus Aichhorn, TeleConsult Austria

Consortium:

TeleConsult Austria (AT), ISTdalarna Utvecklings AB (SE), Amsterdam University Of Applied Sciences (NL), INTELIGENT DELIVERY SA (ES), Txita (ES)

**Focus of the open call:**

ENT III - Urban / last mile logistics

Planned duration: 07/2016-06/2018

HUBHARMONY

Harmonization benchmark for inland multimodal hubs – Future links for sustainability

The project involves developing comparable key figures for analysing business processes and services in multimodal terminals in a European context. The focus here is not on the performance of individual terminals but the comparable evaluation of their services. Goods hubs are placed at the heart of the investigation for an overall view of sustainable multimodal transport systems. By taking the potential for synergy in Europe into consideration, the project contributes to a better understanding of sustainable transport systems and supports terminal operators with the planning of future services.

Consortium:

University of Natural Resources and Life Sciences, Vienna - Institute of Production and Logistics (AT), Wiener Hafen GmbH & Co KG (AT), Institute of Logistics and Warehousing (PL), IFB Inter Ferry Boats (BE)



Focus of the open call:

ENTIII – Hub development

Planned duration: 07/2016-06/2018

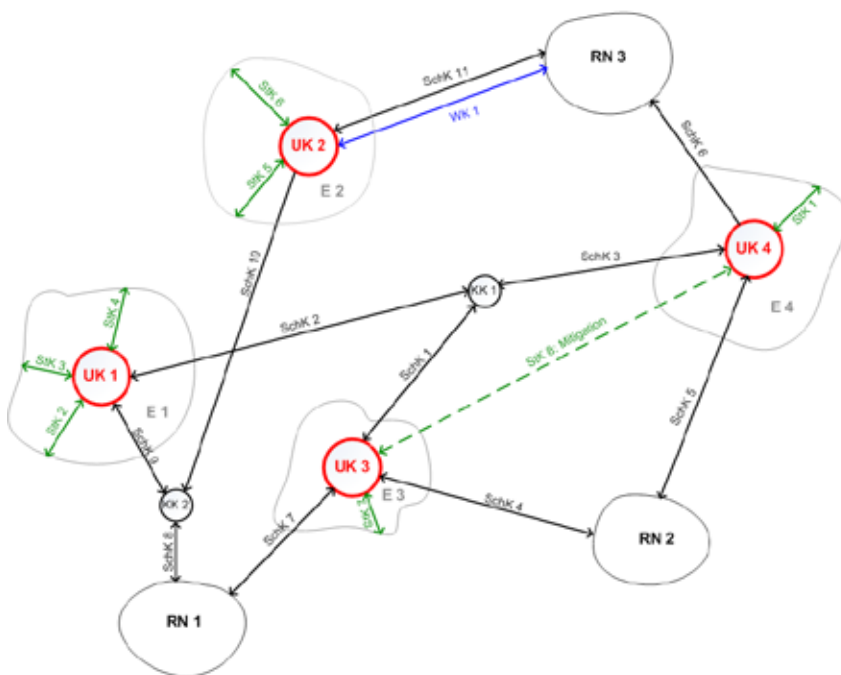


Figure: Analysis of an intermodal terminal network

// The HubHarmony project involved developing uniform standards for evaluating the services of goods hubs, in order to improve the quality of their location. //



Manfred Gronalt, University of Natural Resources and Life Sciences, Vienna - Institute of Production and Logistics

7.b. European R&D projects

Within the context of the 7th EU framework programme for research, technological development and demonstration (2007-2013), research and development programmes in the area of the transport of goods and transport logistics with Austrian partners were funded on the topics of transport and ICT. These projects, which concluded in 2015, are presented here.

The successor programme Horizon 2020, the EU programme for research and innovation (2014-2020), focuses on further research and innovation aspects in the area of transport. Research and development projects from the first open calls with Austrian partners are currently in progress.

The bmvit makes an active contribution to setting the agenda of this programme in the area of transport at European level and as such acts as a link between the framework programme and the national funding programmes.

MODULUSHCA

A logistics system modelled on the Web

A logistics system based on the model of the digital internet: In order to make this vision of the "Physical Internet" (PI) a reality, the European FP7 project "Modulushca" was launched in October 2012. An international consortium of 15 high-profile partners carried out research on this revolutionary approach until February 2016 and took a first real step towards the implementation of PI. In addition to an initial "proof of concept", interchangeable (ISO) logistics units were developed in the form of a modular system and implemented as 3D-printed prototypes. These prototypes of a modular transport box and a platform for networked operational logistics, both of which were developed at Graz University of Technology, were used to highlight the environmental, economic and social advantages by means of trials, simulation and test runs.

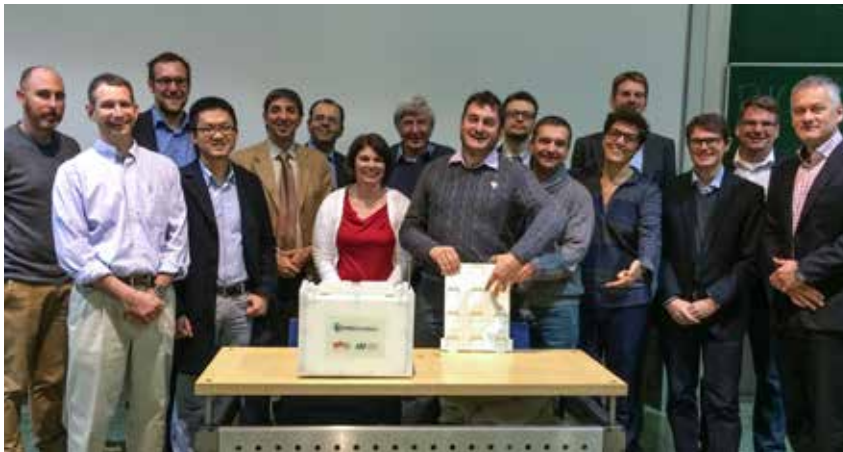


Figure: Project team

“ The physical, digital and operational networking of the worldwide logistics industry on the model of the Physical Internet will be a major accomplishment. The doubts and prejudices of the various stakeholders must be overcome, numerous technical problems solved and economic preconditions created. ”



Florian Ehrentraut, Graz University of Technology – Institute Logistics Engineering

Austrian partner:

Graz University of Technology – Institute of Logistics Engineering



Duration: 10/2012–10/2015

Further information:

www.modulushca.eu; www.itl.tugraz.at



Figure: Transport box prototypes

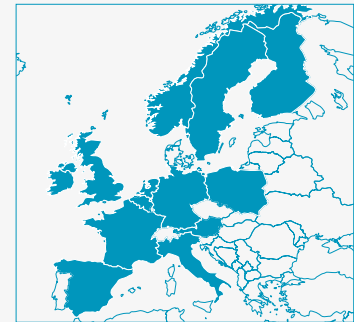
ICARGO

Intelligent cargo in efficient and sustainable global logistics operations

"iCargo" was a 42-month (01.11.2011–30.04.2015) research programme funded by the EU Commission in the area of Transport Logistics and Supply Chain Management in conjunction with Information and Communication Technologies (ICT). The project budget was EUR 11.3 million. iCargo comprised 29 high-profile partners from the worlds of business, industry and research. The University of Vorarlberg was the Austrian representative. The goal of the iCargo project was to develop a global ICT platform (iCargo Business Ecosystem) for all logistics stakeholders which allows prompt communication and collaboration between all stakeholders and increases the transparency of the (logistics) processes. The project focused on achieving better synchronisation and capacity utilisation across all types of transport. The real-time information on traffic and transport infrastructure conditions is intended to help stakeholders optimise their planning processes and reduce emissions.

Austrian partner:

Vorarlberg University of Applied Sciences



Duration: 11/2011-04/2015

Further information:

<http://i-cargo.eu>



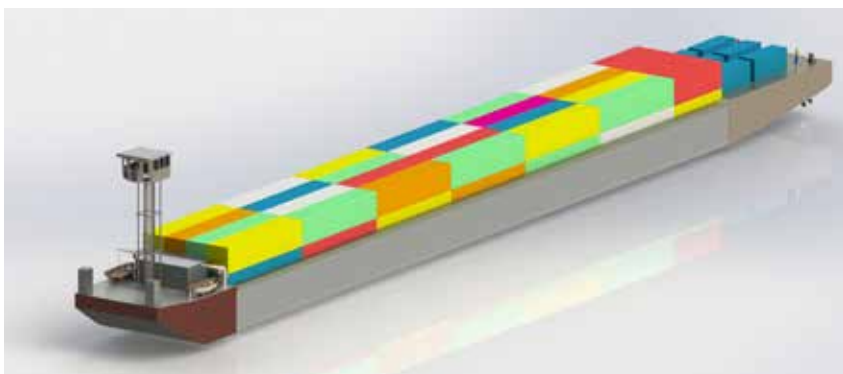
Figure: ICT platform for logistics stakeholders, ecosystem, collaboration

NEWS

Development of a next generation inland waterway ship and logistics system

The goal of NEWS was to make the transport of goods on European waterways environmentally and economically more efficient and to contribute to a shifting of goods transport to the waterway (Danube). The most important result is the concept for NEWS Mark II, which is optimised for container transport, project loading, vehicles, bulk goods and heavy cargo. An active ballast tank allows the draught to be varied by 80 cm within minutes, which means the ship can be used on 80% of Europe's waterways. It can be powered with liquid natural gas or a diesel-electric powerplant. Further results include a financial and business plan for investors and new logistics concepts for inland ports.

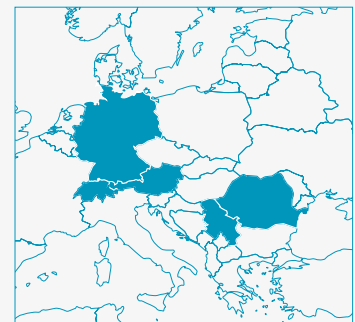
It must be emphasised that even a ship with an ideal technical design is unable to overcome infrastructural inadequacies in many sections of the waterway in order to enable profitable operation.



Figures: 3D model and visualisation

Austrian partners:

Vienna University of Technology -
Institute for Management Sciences,
PROJEKTkompetenz.eu GmbH,
Ziviltechnikerkanzlei Anzböck



Duration: 03/2013-08/2015

Further information:

www.news-fp7.eu

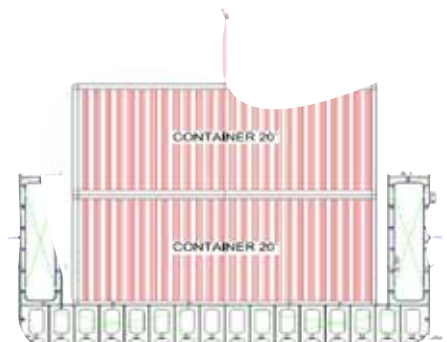


Figure: Cross-section

// Our analyses show that the current infrastructural specifications of the EC are essentially sufficient for transporting goods profitably on the Danube. However, they must be implemented in all countries. The lobbying activities for inland shipping are capable of improvement. **//**



Sandra Stein, Vienna University of Technology -
Institute for Management Sciences, research coordinator

Further projects currently in progress from Horizon 2020:

Novelog

New cooperative business models and guidance for sustainable city logistics

Austrian partners: B.I.M. Beratung und Informationsverarbeitung im
Mobilitätsbereich Frantz, König und Schallaböck OG, City Of Graz

Nextrust

Building sustainable logistics through trusted collaborative networks across the entire supply chain

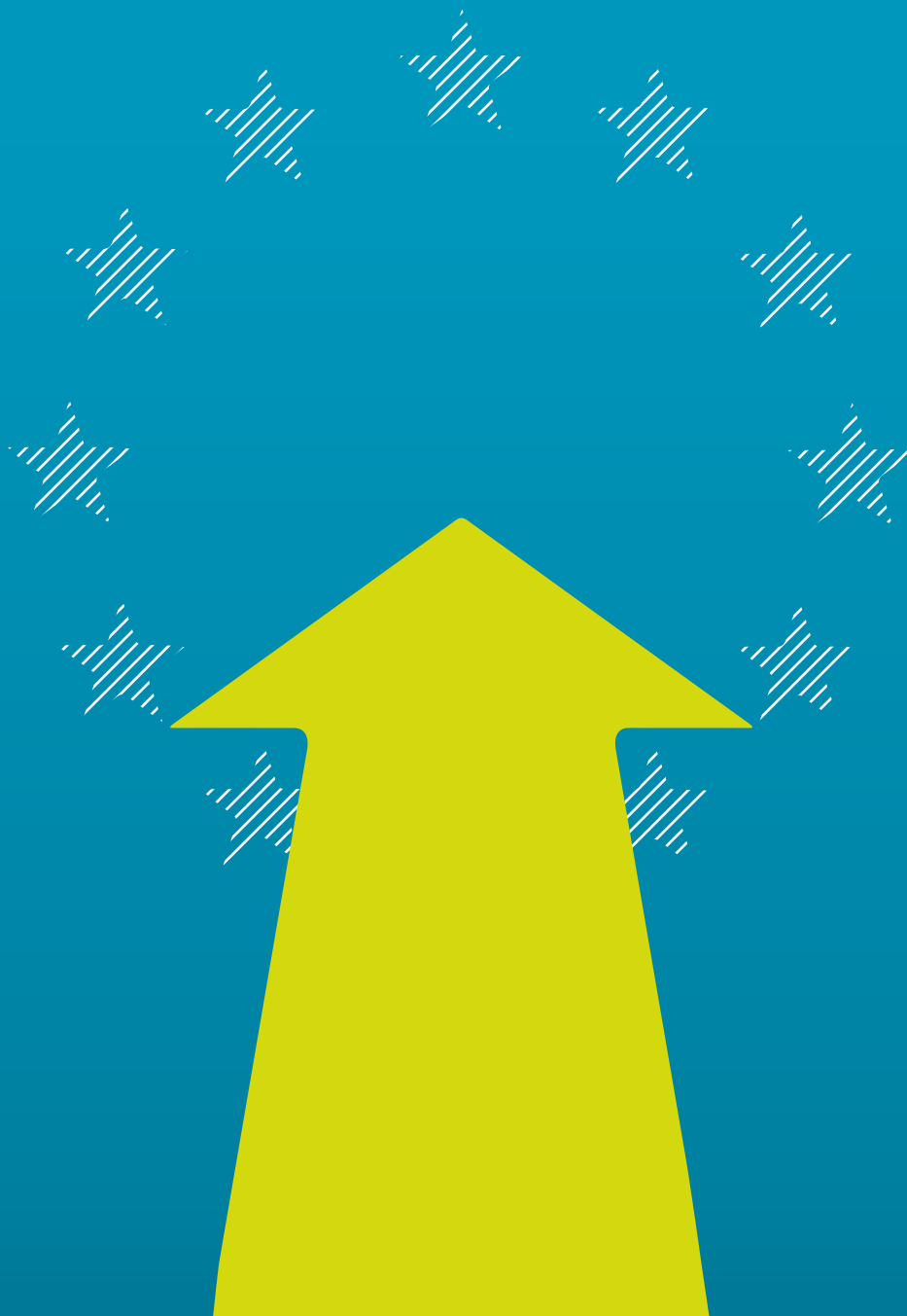
Austrian partners: Wenzel Logistics GmbH, Borealis L.A.T GmbH, Petrolinks
Handels GmbH

Smart-Rail

Smart Supply Chain Orientated Rail Freight Services

Austrian partner: Ecco-Rail GmbH

8. Shaping Europe. Realising visions.



8.a. The European technology platform for logistics ALICE

The European technology platform for logistics ALICE (Alliance for Logistics Innovation through Collaboration in Europe) was founded in 2013. It develops comprehensive strategies for research, development and innovation for Europe in the field of Logistics and Supply Chain Management and advises the European Commission on the implementation of Horizon 2020 in the area of logistics.

The Logistics Network Association (VNL – Verein Netzwerk Logistik) and the bmvit represent Austria in the mirror group of member states and national cluster organisations.

Austrian members in ALICE were MAGNA STEYR AG Et Co KG (until 2015) and currently Gebrüder Weiss Gesellschaft m.b.H and Logistics Research Austria (LRA). They collaborate actively in the five working groups on the following topics:

- ➔ **WG1: Sustainable, safe and secure supply chains**
- ➔ **WG2: Corridors, hubs and synchronomodality**
- ➔ **WG3: Information systems for interconnected logistics**
- ➔ **WG4: Supply chain coordination and collaboration**
- ➔ **WG5: Urban logistics**

Further information:
www.etp-logistics.eu

alice | Alliance for
 Logistics Innovation
 through Collaboration
 in Europe



Figure: Structure of ALICE

/// Austrian RTDI community participation is well balanced in ALICE including industry (Gebrüder Weiss and VNL), research (LRA) and government (bmvit). Austria is fast moving in incorporating Logistics as one of the key challenging sectors to reach competitiveness and sustainability targets. Close collaboration and exchange, ALICE organised a workshop in Vienna last February with 100+ attendees, is allowing us to promote a shared vision on the future of logistics towards the concept of the Physical Internet. ///



Fernando Liesa, Secretary General, ALICE

Vision of ALICE 2050: Physical Internet

The vision of ALICE for 2050 is based on the Physical Internet (PI). The Physical Internet aims at addressing the main challenges in logistics and achieving efficiency and sustainability targets. The focus is on new solutions and business models that will let existing knowledge and new technologies take effect. The global logistics system should be revolutionised with PI. By 2050, physical goods should be sent through the logistics network like data packages on the internet.

What is Physical Internet?

Instead of data being sent in standardised formats and made available at common hubs, PI involves sending physical goods according to the same principle. The standardised formats in this case are modular boxes, which possess the capacity for interconnectivity and localisation. These boxes know about their content, present location and destination, can communicate with other boxes and therefore combine themselves locally into load units and loads. The boxes and the resulting combined loads are transported to a common hub, a PI hub, where they are transshipped. This means that the goods are not distributed on board a transport vehicle from the point of dispatch to the destination but that the load is transported to the nearest PI hub, where it is unloaded, combined to make new loads bound for the destination and then reloaded. The common use of standardised, modular boxes and PI hubs will therefore result in the transportation of a very large number of load units, which will significantly increase the utilisation of the transport vehicles and de facto completely avoid empty journeys.

// *The Physical Internet is changing the distribution of goods to the same extreme that the internet did to communications a few years ago. Total networking in real time and - like the internet - either you're on board, or you're not!*

The membership at ALICE provides us with knowledge about these changes as a minimum benefit. Active participation enables us to shape the framework conditions and not simply look on at the forthcoming change but be a frontrunner - i.e. not to wait for what comes out of the USA but to create a market, create a new business - in other words to be truly innovative. //



Franz Staberhofer, Head of the Logistikum research and education institute of the University of Applied Sciences Upper Austria

8.b. Shift2Rail Technologies for Sustainable & Attractive European Rail Freight

Shift2Rail is a public-private partnership between the European Union and the railway sector. As a research and innovation project, it is intended to secure and strengthen the competitiveness of the European rail industry and at the same time make a contribution to achieving the modal shift goals towards rail contained in the White Paper on Transport. A budget of EUR 920 million is available to the project over a period of six years, EUR 450 million of which from Horizon 2020, the EU programme for research and innovation. The remaining EUR 470 million is provided as a contribution by the founding members and associated members.

Austrian companies and research institutions are represented in three associate members, including the WVAC+ ("Virtual Vehicle Austria Consortium+") with twelve Austrian and one Slovakian partner, as well as the EUROCC ("EUropean Rail Operating community Consortium") with ÖBB-Infrastruktur AG as partner, and Kapsch CarrierCom AG as an individual company. Within the scope of Shift2Rail, Austrian companies will develop Advanced Traffic Management & Control Systems (IP2), Cost-Efficient, Sustainable and Reliable High Capacity Infrastructure (IP3) as well as new Technologies for Sustainable & Attractive European Freight (IP5).

A specific goal is, for example, to reduce the weight of freight waggons for increasing transport capacity implementing the 5-L concept for freight waggons. This will enable a 10% increase in payload. "5-L" stands for Low-noise, Lightweight, Long-running, Logistics capable, and LCC-orientated. At the same time, research will be carried out in areas such as new braking technologies and anti-slip concepts so that waggons are capable to carry heavier loads and thus be used more cost-effectively.



II The Shift2Rail initiative will lead to significant technology leaps in European freight transport. The participation of WVAC+ will also bring frontrunner products from Austria onto freight rail and prepare them for export around the world, such as, for example, the "Waggon Tracker". This is an autonomous freight waggon monitoring system for the monitoring of vehicle and goods. **II**



Martin Rosenberger, Kompetenzzentrum – Das virtuelle Fahrzeug Forschungsgesellschaft mbH, coordinator of WVAC+

Further information:

<http://shift2rail.org>



Austrian partners:

WVAC+ (IP3, IP5): Virtual Vehicle Research Center, AVL List GmbH, Getzner Werkstoffe GmbH, Kirchdorfer Fertigteilvertriebs GmbH, PJ Messtechnik GmbH, Plasser & Theurer Export von Baumaschinen GmbH, voestalpine Schienen GmbH, voestalpine VAE GmbH, FCP Fritsch, Chiari & Partner ZT GmbH, Wiener Linien GmbH & Co KG, AC2T research GmbH, Materials Center Leoben Forschung GmbH



EUROCC (IP3): ÖBB-Infrastruktur AG

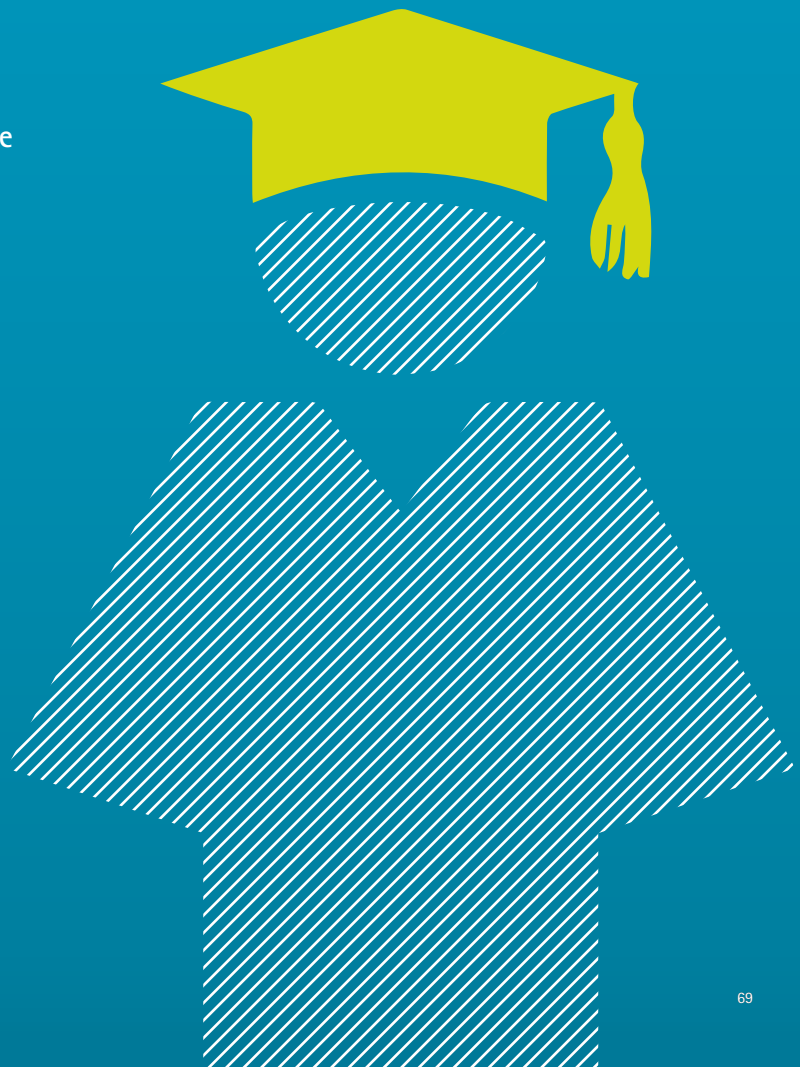


Kapsch CarrierCom AG (IP2)



9. Promoting the next generation.

With the goal of offering doctoral students ways of getting into applied research, a comprehensive open call on dissertation projects on the topic of Mobility of the Future was conducted in 2013 between the Mobility of the Future programme and the talent programme of the bmvit. Out of thirteen projects, two projects on the topic of the transport of goods and transport logistics are also supported.



EXPANSIONSMASCHINE

Design and trialling of potential expanders for mobile waste heat utilisation under specific system and vehicle conditions

Machines with different operating principles can be conceived for a mobile waste heat utilisation system (e.g.: reciprocating piston, axial piston, rotating piston, screw, scroll expander, expansion or impulse turbines). On the basis of criteria and conditions yet to be defined, a range of expanders should be designed and trialled in order to identify the most suitable type of machine for series application.

Project holder:

MAN Truck & Bus Österreich AG

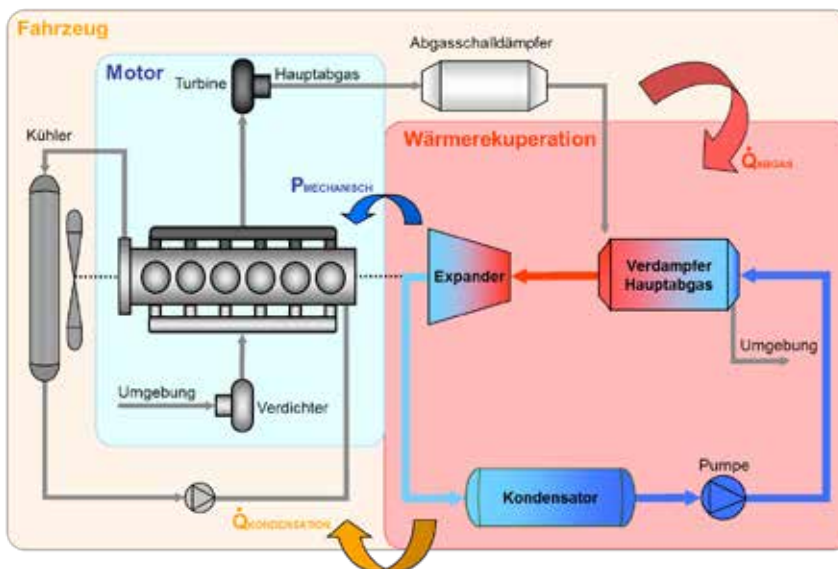


Figure: Expansion machine

/// Using the right expansion machine in the waste heat recovery system on future commercial vehicles will enable a decisive contribution to the fulfilment of consumption targets and to a reduction in carbon dioxide emissions. The funding enables the conducting of a systematic investigation and evaluation. **///**



Stefan Stanzer, MAN Truck & Bus Österreich AG, doctoral student

INLAND_CAR

Choosing a mode of transport in the automotive distribution logistics sector – supporting the decision through the quantification of costs and environmental effects

The research project Inland_Car deals with the optimal choice of the mode of transport when designing transport chains in the automotive distribution logistics sector. In this regard, the costs and environmental effects of the modes of transport road, rail and waterway are quantified in the context of single and multiple link transport chains. Particular attention is paid to the specific circumstances of the roll-on/roll-off method and innovative transport concepts such as containerised vehicle transport.

Project holder:
Fraunhofer Austria Research

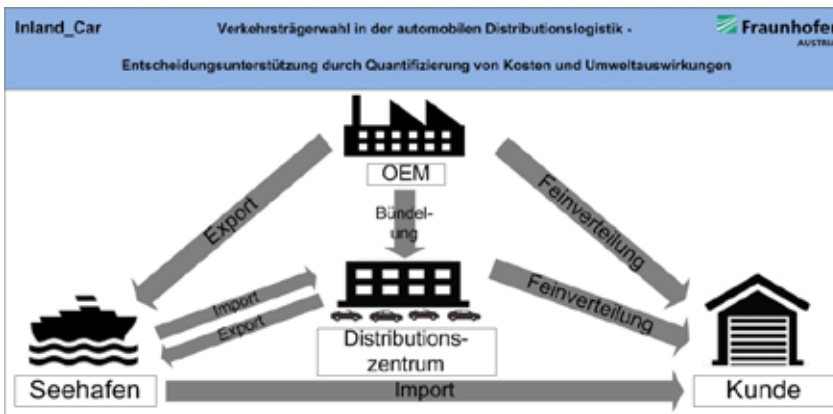


Figure: Choosing a carrier in the automotive distribution logistics sector

“ The funding of the research project “Inland_Car” allows me to work intensively on an issue of relevance to the Mobility of Goods. Apart from developing the subject further, it has already been possible to make new contacts in science and industry and extrapolate follow-on projects. ”



Heimo Pascher, Fraunhofer Austria Research, doctoral student

10. Creating structures. Closing gaps.



10.a. Endowed Chair for Sustainable Transport Logistics 4.0

Mobility of the Future held an open call for an endowed chair in 2015. The bmvit wishes to use the endowed chair to build up knowledge on the topic "Sustainable Transport Logistics 4.0" at the innovation location of Austria and to further strengthen the cooperation between science and industry. Specifically, the endowed chair addresses the building up of competencies in the area of transport logistics, which primarily concern the integration of new technologies, above all with reference to Industry 4.0, in conjunction with the 'internet of things' and intelligent transport systems and services, into the application fields of transport logistics with the goal of achieving sustainability. The goal of the endowed chair is to close the existing gap in the area of research and science-driven theory at the interface of the systemic valorisation of new technologies in the area of transport logistics in 1.) urban and suburban spaces, 2.) with the specific involvement of end users (companies and residents) and 3.) with a specific focus on intelligent services that are based on these technologies. The endowed chair in the area of application-orientated research into future topics of transport logistics is intended, with its problem-orientated research questions, to support companies in the area of transport logistics to raise their future potential for success on the market. In addition, it should cover the demand in the economy for outstandingly trained transport logistics experts, who should support companies to navigate safely through the future of the next industrial revolution with their interdisciplinary knowledge.

// *There is agreement – not only in the scientific community – that the Physical Internet will enable a sustainable reorganisation of transport logistics in order to achieve positive economic, environmental and social effects. The JKU and its partners see the appointment of the endowed chair as an instruction to establish an innovation centre in the field of the Physical Internet. This should achieve not only significant added value for the Austrian research landscape, economy and society but also position local research on this highly topical issue in the international leading group, i.e. to generate impulses of international importance. //*



Gustav Pomberger, Johannes Kepler University Linz,
Head of the Department of Business Informatics - Software Engineering

The bmvit will support the endowed chair with EUR 1.2 million (50% of the total costs). The intended professorship will take up the concept of the "Physical Internet", a concept that aims at revolutionising the logistics system on the model of the internet. Building on this concept, the new research focus should investigate how the Mobility of Goods in conurbations can be made more sustainable in the future by balancing the interests of the environment, economy and society.

Consortium:

Johannes Kepler University Linz,
Logistikum research and education
institute of the University of Applied
Sciences Upper Austria, DB Schenker,
Österreichische Post AG, Hödlmayr
International AG, Pfeiffer HandelsgmbH

The position is expected to
be filled from 2017.

10.b. Urban mobility labs

In order to create support structures for innovation ecosystems in urban spaces, eight exploratory studies on urban mobility labs were funded in 2014 and delivered results in early 2016.

Some of these also deal with aspects of relevance to the Mobility of Goods and are listed here:

IMOLA-ZOÖ

MobiLab – The Mobility of Goods revisited

In the central region of Upper Austria, where notable companies are established, the economy induces enormous flows of people and goods transport. A particular challenge is posed by the interaction of functional logistics, goods and passenger transport as well as locational factors.

The project explored the idea of an industrial mobility lab for the central region of Upper Austria in order to revisit sustainable mobility solutions in this complex environment of wide-ranging requirements, strategies and objectives by means of innovative methods and together with all stakeholders.

Contact:

Christian Haider, University of Applied Sciences Upper Austria

Partners:

AIT Austrian Institute of Technology GmbH, EVOLARIS NEXT LEVEL GMBH



MLAB_TEI+TAU

Mobility lab sharing+swapping City region Bruck-Kapfenberg-Leoben

This exploratory project examined the potential of implementing a future urban mobility lab in the region covering the cities of Bruck, Kapfenberg and Leoben. The thematic focus of this lab was the development of innovative mobility solutions in the areas of passenger and goods transport. The Urban Mobility Lab sees itself as an open platform for applied mobility research on which interested stakeholders from the worlds of politics, administration, economy and civil society should develop the mobility solutions of the future together with users and researchers.

Contact:

Robert Hermann, MU Leoben – Industrial Liaison Department

Partners:

verkehrplus – Prognose, Planung und Strategieberatung GmbH, innoFreight Speditions GmbH, Bruck-Oberaich Wirtschaftsentwicklungs GmbH, evolaris next level GmbH, Vienna University of Technology – Department of Spatial Planning

URBAN MOBILITY LAB

City logistics and delivery service – innovative approaches to “Mobility lab Graz without borders”

The exploratory phase of the Urban Mobility Labs in the Greater Graz region produced diverse approaches to future innovations in urban passenger and goods transport. A number of highly promising initiatives for handling the transport of goods in a more efficient and environmentally friendly manner are already running in the city of Graz. During the exploratory phase, numerous stakeholders were involved in developing and progressing ideas for lab projects together in a range of formats. Future approaches will focus on the optimisation of transport routes (last mile), delivery services and the use of sustainable transport vehicles, including for private shopping trips.

Contact:

Robert Schmied, E-mobility Graz GmbH

Partners:

Holding Graz – Kommunale Dienstleistungen GmbH, STADTLABOR GRAZ, Graz University of Technology – Institute of Highway Engineering and Transport Planning



UML-FREIGHT 4.0

good – better – goods – or do you want to carry it yourself?

Logistics is not emotional and therefore always causes delayed reactions instead of active actions. The uncertainty about investments is too great to try new ways. Logistics users are not involved enough and there is too little communication/information for better coordination between the stakeholders. UML discovers newly emerging or previously unanswered needs in the context of urban goods logistics and provides information about all relevant national and international initiatives as well as companies. It combines the most suitable stakeholders from research, economy, public sector and civil society into consortia and pursues the goal of creating innovations pertaining to goods logistics. The corporate purpose of the UML is to facilitate innovations for effective and efficient urban goods logistics that are as free from emissions as possible as well as to reclaim public, urban spaces. Solutions should be of benefit to society and should either create new markets or be successfully integrated into the existing market. UML = Creating innovation with users and not just for users.

// Innovation environments should not be compulsively pressed into tight rules. Rather they should establish themselves where different ways of thinking are permitted. The diverse challenges of urban goods transport require us to have an open dialogue, start-up mentality and international networking all at once. //



Sonja Maria Protic, University of Natural Resources and Life Sciences, Vienna –
Institute of Production and Logistics

// The workshops showed that there is great interest in implementing more effective and efficient logistics solutions and that there is already a large number of wide-ranging ideas and solutions available. The goal now is to overcome existing barriers and to set change in motion in interaction with the public sector, economy and science. //



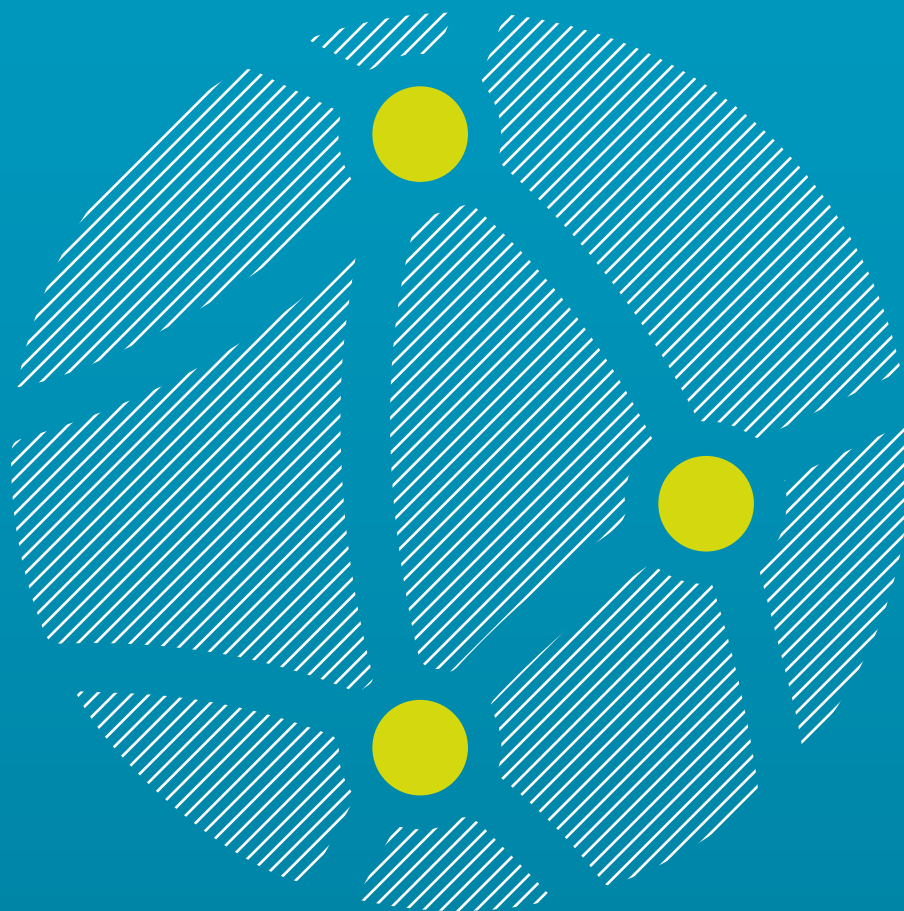
Barbara König, University of Natural Resources and Life Sciences, Vienna –
Center for Global Change and Sustainability

Contact:

Manfred Gronalt, University of Natural Resources and Life Sciences, Vienna –
Institute of Production and Logistics



11. Networking.



11.a. Networking ideas.

Event series "Successful through innovation"

The event series "Successful through innovation" included networking and informational events on the open call for proposals of relevance to the Mobility of Goods in Mobility of the Future for networking, including:

- ➔ **Transport Industry & Logistics meets Research & Development (2013)**
- ➔ **Transport Industry & Logistics meets Vehicle Technologies & Intelligent Transport Systems (2014)**
- ➔ **New Ways in the Transport Industry and Logistics (2016)**

During the event, the participants had the opportunity to gain insights into ongoing research, technology and innovation projects, as well as the chance to talk with each other about current challenges and trends, to develop ideas for innovative solutions and to find out about specific research funding options within the scope of the open call for proposals.

11.b. Networking results.

Networking workshops for recently concluded R&D projects

Twice a year, in the spring and autumn, the bmvit and the FFG organise a networking workshop for concluded R&D projects that were completed in the respective half of the year.

At the interactive workshops, the achieved project results are presented and their potential impact on the Mobility of Goods highlighted. The workshops also serve as networking events for grant recipients. External experts offer the possibility to receive objective feedback. The participating project representatives award one of the presented projects with the Spring Award and one with the Autumn Award.



Figure: Project participants of the 1st networking workshop for concluded R&D projects - the Spring Award 2015 went to Food4all (p. 14)



Figure: Project participants of the 2nd networking workshop for concluded R&D projects - the Autumn Award 2015 went to CinderRailer (p. 21)



Figure: Project participants of the 3rd networking workshop for concluded R&D projects - the Spring Award 2016 went to ILKÖ (p. 24)

The networking workshops have become well established and will be held again in the future.

11.c. Networking women.

A networking workshop where women discuss current developments in the Mobility of Goods

The workshop served as a supporting measure in the programme Mobility of the Future. The proportion of women on the independent committee of experts for the topic of the Mobility of Goods is around 31%. However, the share of female researchers and above all female project leaders is still very low. Only one in ten contacts at the project partners is a woman and only one in eleven projects is headed up by a woman. There is a need for action in this area, which is why a workshop for the networking of women involved in research into the Mobility of Goods was organised in 2015 with women from companies in the area of goods transport and transport logistics. This was aimed both at creating new research and development projects by way of cooperation between companies and research institutions and at increasing the number of female researchers and project leaders.

The workshop in December 2015 was conceived in cooperation with the Damen.Logistik.Club (Women's Logistics Club) and implemented with the Austrian Research Promotion Agency (FFG).

“Increasingly complex requirements in the logistics industry demand answers from researchers. As a logistics consultant, I have to know both worlds in order to be able to meet current requirements and future trends at the same time. Networking workshops and platforms such as the Damen.Logistik.Club help to understand logistics as an integrated discipline.”



Gerda Hartmann,
ECONSULT Betriebsberatungsgesellschaft m.b.H.

“My industry colleagues and I in the “Damen.Logistik.Club” found the networking between women from research and women from industry to be an exciting enrichment! The format was entertaining and informative. I found the results of the research into the effects of e-commerce on the overall transport system and the insights into transport information in the digital age to be particularly interesting. We look forward to accepting Mr Thomas Ruthner’s invitation to the “Damen.Logistik.Club” to go on a tour of the Ö3 traffic newsroom.”



Romana Steko-Papousek,
STEKO-TRANS Güterbeförderungs Ges.m.b.H.

“It’s nice to see how interesting ideas can be developed in no time at all when smart minds come together. It is important to create space for this so that the existing can be improved and developed further and the new can be created. Apart from that, it is a good opportunity to network with each other regularly and make new contacts.”



Beate Färber-Venz, Venz GmbH

“The networking workshop offered the possibility to gain insights into current research activity and to assess any need for research on the various topics. It was especially interesting to enter into discussion with interested participants and to discuss further relevant project-specific problems and possible solutions.”



Alessandra Angelini, Vienna University of Technology – Department of Spatial Planning, Center for Transportation Systems Planning

11.d. Networking the next generation.

Networking workshops on the dissertation projects

The bmvit has also linked the funding of dissertation projects on the topic of Mobility of the Future with a networking format covering all topics, which is intended to offer the students the opportunity for subject-based, interdisciplinary and personal exchange. The workshops, which are held several times each year, are accompanied by excursions to relevant companies and institutions of applied research.

The 1st networking workshop was held under the banner "Mobility – an interdisciplinary field" in Vienna in 2014, the 2nd networking workshop under the banner "Stopover in Graz" with a visit to AVL List GmbH, the Virtual Vehicle Research Center and MAGNA STEYR AG & Co KG.

At the beginning of 2016, the doctoral students had an exchange with the students of the doctorate college URBEM – Urban Energy and Mobility System, set up jointly by Wiener Stadtwerke Holding AG and the Vienna University of Technology, and the students of the University of Technology doctorate college EWARD – Energy and Resource Awareness in Urban and Regional Development. They then paid a visit to Bombardier, the AIT – Austrian Institute of Technology and ITS Vienna Region.

Within the scope of the networking format, it was also possible for the doctoral students to participate in thematically appropriate European conference such as the ITS European Congress in Helsinki, the Transport Research Arena in Warsaw and others.

The networking format is organised on behalf of the bmvit by AustriaTech – Gesellschaft des Bundes für technologiepolitische Maßnahmen GmbH.



Figure: Visit to the Virtual Vehicle Research Center,
source: Virtual Vehicle Research Center

// The objectives of the networking format are to extend the extremely diverse and complex area of mobility beyond the students' own dissertation topics, to enable a professional and personal dialogue with other scientists and colleagues, to network with relevant industrial and research institutions and to open up the international dimension. Feedback from the doctoral students suggests that we have so far achieved these objectives very well. We also try to take the students' suggestions on board and to develop the format accordingly. **//**



Gertraud Oberzaucher, AustriaTech GmbH

11.e. Strengthening topics.

Research forum Mobility for All 2013 under the banner "Cyclelogistics"

The research forum "Mobility for All" was held in December 2013 on the topic of "Cyclelogistics". The event presented social trends and current research results on the topics of bicycle logistics and the transport of goods, raised awareness of the potential and advantages of transporting goods by bicycle, and highlighted how innovative solutions can be implemented and more awareness created at the level of consumers. In addition, a range of best-practice solutions from across Europe was presented.



Figure: Cargo bike in use, source: cyclelogistics.eu

LRA Forum – Logistics Research Austria – Physical Internet – Caught between Fiction and Reality?

The bmvit supported the LRA forum on the topic of "Physical Internet – Caught between Fiction and Reality?", which was held in February 2016.

The forum served as an event for bringing together the international ALICE experts with the relevant Austrian research community and relevant representatives of the industry. The academic keynote speech was given by Rod Franklin from the Kühne Logistics University, one of the gurus of the Physical Internet. A discussion was held afterwards at an industry round table with notable business representatives, who took a critical look at the visions for the Physical Internet.

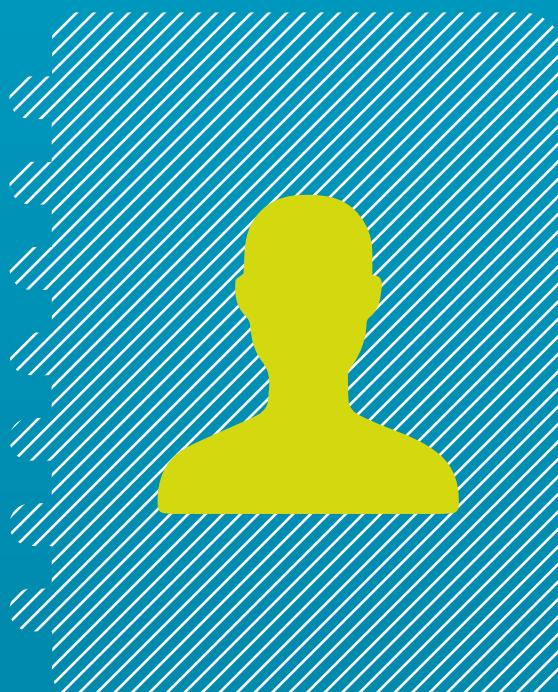


Figure: Industry Round Table, Source: Jürgen Angel/Vienna University of Economics and Business



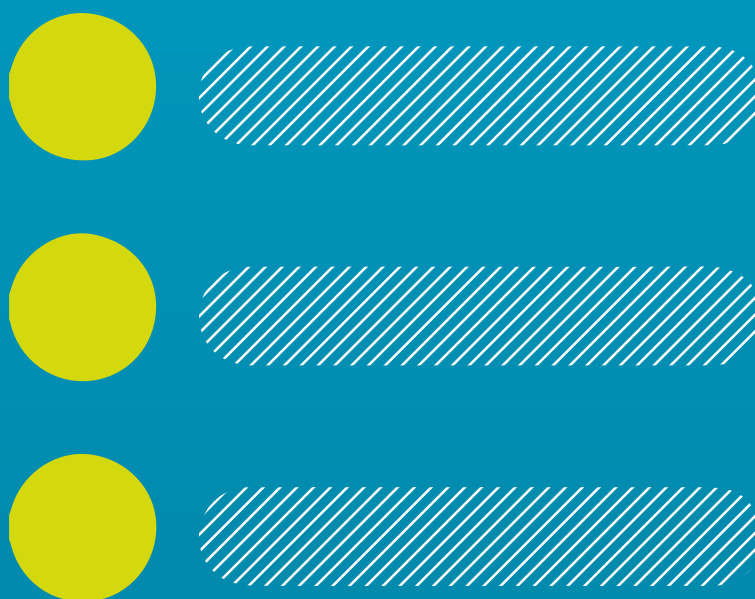
Figure: Rod Franklin, Source: Jürgen Angel/Vienna University of Economics and Business



12. List of grant recipients 2012–2016



- A** ABC Consulting
AIT Austrian Institute of Technology GmbH
aka buna design consult, Dr. Bernhard Rothbucher e.U.
arp® raum.landschaft.mobilität
Aspöck Systems GmbH
Austrian Institute for SME Research
AUSTRIAPRO
AVL List
- B** BergsTopp GmbH
BikeCityGuide Apps GmbH
BOKU – Institute for Transport Studies
BOKU – Institute of Marketing and Innovation
BOKU – Institute of Production and Logistics
Bruck-Oberaich Wirtschaftsentwicklungs GmbH
Business Upper Austria – OÖ
- C** c.c.com Andersen Et Moser GmbH
Cargo Flex Rail OG
CargoMon Systems GmbH
CHEP Österreich GmbH
CombiNet – Combined Transport Network
CONTAINER PROIZVODNO PODJETJE, d.o.o.
- D** DB Schenker
DHL Globalforwarding (Austria)
- E** E-mobility Graz GmbH
EBE Solutions
Econsult Betriebsberatungsgesellschaft m.b.H.
EN GARDE Interdisciplinary GmbH
Energycomment
Ennschafen OÖ GbmH
EUC Energie- und Umweltconsulting DI
Gerfried Cebrat e.U.
evolaris next level GmbH
- F** Federal Branch Transport and Traffic
FH St. Pölten ForschungsGmbH Flughafen Wien AG
Forschungsgesellschaft Mobilität – Austrian Mobility Research FGM – Amor gemeinnützige Gesellschaft m.b.H.
Fraunhofer Austria Research
Freight Association
FTW Vienna Telecommunications Research Centre
Fuhrwerk Logistik GmbH
- G** GAHO-Consult GmbH
Gebrüder Weiss Gesellschaft m.b.H.
Gerhard Zoubek Vertriebs KG
GRAZ CITY LAB
Graz University of Technology – Institute of Automotive Engineering
Graz University of Technology – Institute of Highway Engineering and Transport Planning
Graz University of Technology – Institute of Highway Engineering and Transport Planning
- Graz University of Technology – Institute of Internal Combustion Engines and Thermodynamics
Graz University of Technology – Institute of Logistics Engineering
Graz University of Technology – Institute of Railway Engineering and Transport Economy
GS1 Austria GmbH
- H** h2 projekt.beratung KG
Hauliers Association
Herry Consult GmbH
Hödlmayr International AG
Holding Graz – Kommunale Dienstleistungen GmbH
- I** i-LOG Integrated Logistics GmbH
Ilse Kral Transport Company
inet-logistics GmbH
Ing. Karl Picker e.U.
innofreight Expeditions GmbH
Institut für Integrierte Produktion Hannover gemeinnützige Gesellschaft m.b.H.
Institut für Marketing – Strategieberatung GmbH Et Co. KG
Institut für Verkehrssystemplanung HAUGER science:talk KG
INSTITUTE FOR ENVIRONMENTAL URBAN DEVELOPMENT
Interlogistik GmbH
IPN Intelligent Predictive Networks GmbH
IT-eXperience Informationstechnologie GmbH
- J** Johannes Kepler University of Linz – Inst. for Production and Logistics Management
- K** Kanzlei DI Richard Anzböck
KEBA AG
- L** LEVI – Food-Producer-Consumer-Initiative
Lichtenberger Et Partners Solicitors
Logistik Service GmbH
Logistikum der FH Oberösterreich
LTE Logistik- und Transport-GmbH
- M** MAN Truck Et Bus Österreich AG
MANOVA GmbH
MEV Independent Railway Services GmbH
Mitteregger, DI Dr. Mathias
MONTAN Speditionsgesellschaft m.b.H.
Moser Transport GmbH
MU Leoben – Industrial Liaison Department
- N** Naber EDV-Dienstleistungs- Et -Handels-OG
nast consulting ZT GmbH
netwiss OG
- O** ÖBB-Infrastruktur AG
Oesterreichische Kontrollbank Aktiengesellschaft
OMV Refining Et Marketing GmbH
OnTec Software Solutions AG
Österreichische Energieagentur
Österreichische Post AG
- P** Paradigma Unternehmensberatung GmbH
Pfeiffer HandelsgmbH
Prisma solutions EDV-Dienstleistungen GmbH
promotion&co Florian Podroschko
- Q** Quehenberger Logistics GmbH
- R** Rail Cargo Austria AG
RISC Software GmbH
- S** Salzburg AG for energy, transport and telecommunications
SATIAMO GmbH
Schachinger Immobilien und Dienstleistung
SCHEUWIMMER Fahrzeugbau GmbH
Symbionis Software, Skills Et Technologies GmbH
- T** TAGipilot GmbH
tbw research GesmbH
TECHNOMA Technology Consulting Et Marketing GmbH
TINA International GmbH
Tiroler Straße-Schiene-Umschlaggesellschaft m.b.H.
Traffix Verkehrsplanung GmbH
- U** Ulbrich Maschinenbau- und Export-Import Vertriebsg.m.b.H.
University of Applied Sciences bfi Vienna
University of Applied Sciences Upper Austria
University of Vienna – Inst. For Business Administration
- V** verkehrplus – Prognose, Planung und Strategieberatung GmbH
via donau – Österreichische Wasserstraßen-Gesellschaft m.b.H.
Vienna University of Economics and Business – Institute for Export Management
Vienna University of Economics and Business – Institute for Transport and Logistics Management
Vienna University of Technology – Dep. of Spatial Planning
Vienna University of Technology – Institute for Powertrains and Automotive Technology
Vienna University of Technology – Institute of Transportation
Vorarlberg University of Applied Sciences
- W** Wiener Hafen GmbH Et Co. KG
Wiener Lokalbahnen Cargo GmbH
WIGeoGIS Softwareerstellungs- und Handelsgesellschaft m.b.H.
Wirtschaftsagentur GmbH

13. RTI projects Focus areas



| Topic | Short title | Long title |
|---|---|--|
|  <p>Sustainable Mobility of Goods in cities</p> | EAGLE | Development of an automated goods unloading system |
| | Gewerbelogistik | Logistical business and operator models for supporting small enterprises and traders |
| | GüMoS | Sustainable Mobility of Goods in cities – Guideline for RTI projects |
| | GutZuFuß | Small goods transport using active and sustainable forms of mobility |
| | IMOLA-ZÖÖ | Industrial Mobility Laboratory – Central Upper Austria |
| | LoMACro+ | Local Marketplace for Crowddelivery+ |
| | Mlab_tei+tau | Mobility lab sharing+swapping city region Bruck-Kapfenberg-Leoben |
| | MULE | Mobile multifunctional urban logistics platforms with electric drive |
| | NOVELOG | New cooperative business models and guidance for sustainable city logistics |
| | UML-freight 4.0 | Urban Mobility Lab: smart urban freight logistics 4.0 |
| | Urban Loading | Urban loading zone management |
| urban mobility lab | Mobility Lab Graz – innovative urban mobility solutions for the Greater Graz region | |
|  <p>Sustainable solutions for "First/last mile"</p> | CConT | Cooperative container trucking |
| | eComTraf | Effects of e-commerce on the overall transport system |
| | GreenCityHubs | Design of last-mile delivery logistics with several hubs as well as alternative vehicle and propulsion technology |
| | SAILOR | Smart last mile commerce |
| | Food4all@home | Nationwide home delivery of everyday items |
| | KoLaMBra | Development of an integrated organisation concept for cooperative last-mile industry logistics |
| | LAMIOP | Last-mile optimisation |
| | NAHTRANSPORT | Development of a non-motorised goods transport system for local supply |
|  <p>Intermodal hubs</p> | ASB-CombiHub | The hybrid use of existing railway sidings as intermodal hubs for Combined Transport |
| | HubHarmony | Harmonisation benchmark for inland multimodal hubs – Future links for sustainability |
| | IMPALA | Intermodal hubs as urban logistics centres |
| | innoTRAIL | Innovative Tyrolean regional concept for an Alpine intermodal logistics terminal |
| | KANBAHN | Capacity analysis and development of operating strategies for multimodal railway access points |
| | optihubs | Optimising logistical processes at multimodal hubs for hydrophilic types of goods by the example of the port of Vienna |
| | Q4 | Quattromodal hubs - Scientific and practical relevance for the transport of goods |
| | Smart Hubs 2.0 | Optimisation of multimodal hubs in Corridor VII (Danube Corridor) |
| | TeTraNet | Terminal-based transport network for industrial enterprises |
| | TRIUMPH II | Trimodal Port Transshipment Point II – Efficient flow through digital networking |
|  <p>Motor vehicles for moving goods</p> | EFLOG | Potentials of the services of new vehicle technologies to the offerings of logistics service providers |
| | Expansionsmaschine | Design and trialling of potential expanders for mobile waste heat use under specific system and vehicle conditions |
| | MoVe The NuVe | Engine consumption, emission and thermal management measures for goods vehicles in inner-city transport |
|  <p>New services through data generated by (commercial) vehicles</p> | AutoStat | Use of tracker/transponder technologies for official transport statistics |
| | Benchmark TransSped | Utilisation of data generated by vehicles in a benchmark tool for transport companies |
| | Datenverkehr | Real-time data use for the sustainable improvement of the traffic and environmental situation regarding the transport of goods |
| | IZMT | Intelligent status monitoring of engines in the transport sector |
| | Services Tachograph | Potentials of using the digital tachograph for integrated mobility services |
| | TRACE | Identification of route choice decision criteria in road transport and preparation of a methodological manual |

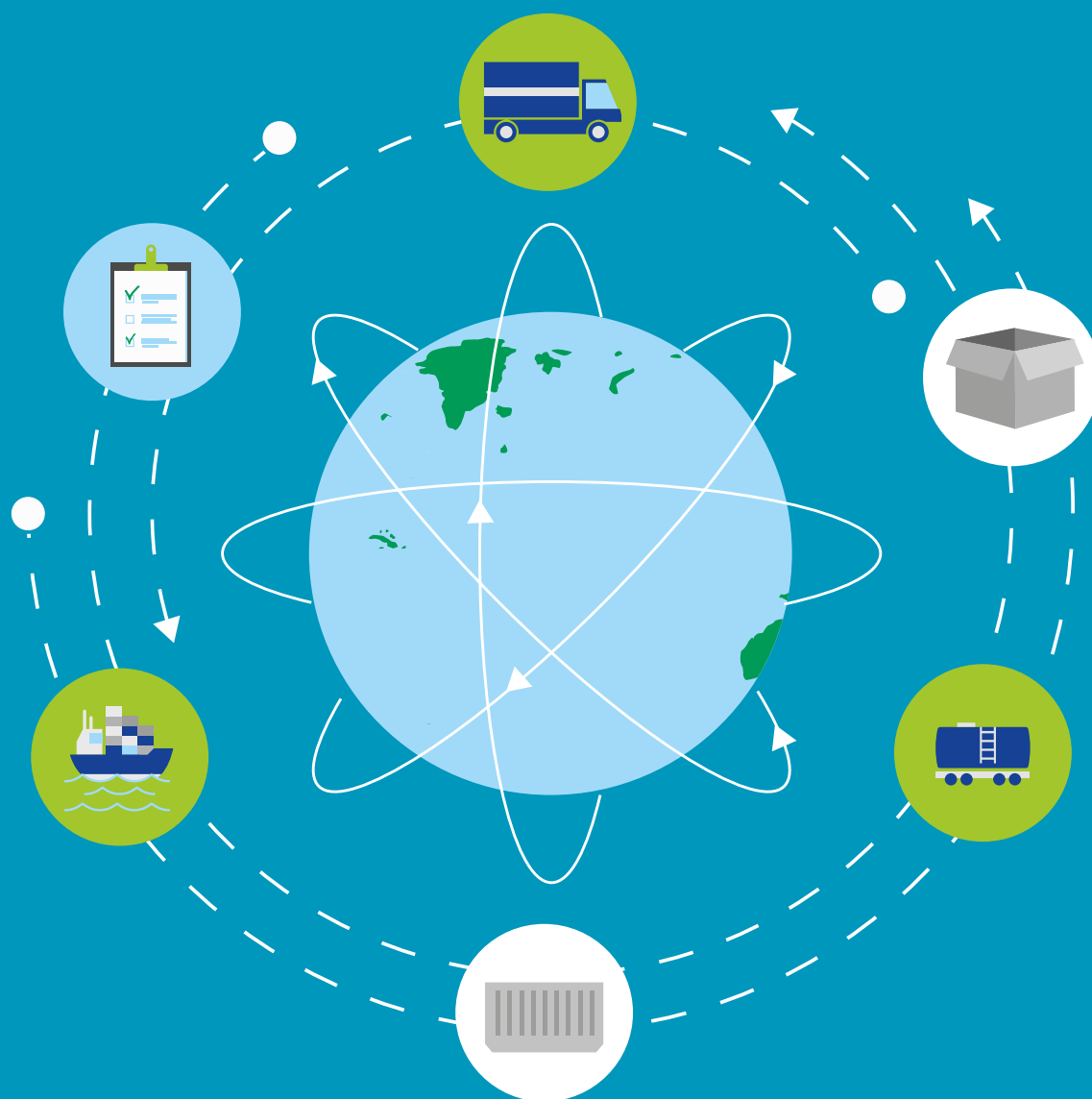
| Topic | Short title | Long title |
|--|--|--|
|  <p>Sustainable transport chains and networks</p> | ACCIA | R&D potentials in the airfreight processes in Austria – Air cargo research and development capabilities in Austria |
| | BaKuRo | Coupling robots for marshalling yards |
| | cargo2go | Innovative two-stage supply concept for urban spaces independent of load units and modes of transport |
| | CEE Riverbridge | CEE Riverbridge along the Rhine-Danube Corridor |
| | CinderRailer | Network of polygonal transport for the combination of slag and gypsum transport with the same containers. |
| | EntKuRo | Automated decoupling process for marshalling yards |
| | Go2PI | Ways of implementing the Physical Internet |
| | iCargo | Intelligent cargo in efficient and sustainable global logistics operations |
| | ICIIT-TFM | Intelligent cargo infrastructures for intermodal transport chains - Transport management framework |
| | ILKÖ | Integrated logistics network for combined transport in Austria |
| | INCOM-F | Austrian RTI competences at the interface of the transport of goods and logistics |
| | IND4LOG4 | Industry 4.0 and its effects on transport logistics |
| | Inland_Car | Quantitative evaluation of intermodal transport chains - Distribution of finished vehicles along the water highway |
| | InnoSteel II | Increasing the quality and efficiency of steel transport by means of innovative goods waggon monitoring and data aggregation |
| | IPPO | Intelligent networking of forecast, planning and optimisation for the design of sustainable transport chains |
| | KV FTI | Combined goods transport - Highlighting future potentials of research and innovation |
| | MultiStrat | Multimodal strategies for greener and more resilient wood supply |
| | NaLaBISta | Sustainability map for production & industrial locations, for the sustainable Mobility of Goods |
| | NEXTRUS | Building sustainable logistics through trusted collaborative networks across the entire supply chain |
| | ÖKO-LOG | Sustainable delivery of regional food |
| | RouteComAssistance | Optimising transport chains through organisational and technical involvement of innovative ICT for train drivers |
| | RTM-0 | Rail Transport Mobility Optimisation |
| | RTM-0 ERWEITERUNG | Rail Transport Mobility Optimisation Expansion |
| | Shift2Rail-IP5 | Technologies for Sustainable & Attractive European Rail Freight |
| smartBOX | Small goods mobility 2.0 | |
| SteelLogisticSystems | Modular logistics system for the industrial logistics of semi-manufactured and finished goods of the steel industry. | |
| Stiftungsprofessur | Sustainable Transport Logistics 4.0 | |
| SynChain | Synchromodal logistics chains | |
| TruckAero | Variable body geometry for goods vehicles | |
|  <p>Innovative transport means and media</p> | InnoSteel | Increasing the quality and efficiency of steel transport by means of innovative goods waggon monitoring and data aggregation |
| | Kombi-Flex Waggon | Feasibility study for modular quick-load waggons for the efficient loading and unloading of semi-trailers |
| | Modulushca | A logistics system modelled on the Web |
| | NEWS | Development of a next-generation inland waterway ship and logistics system |
| | RAKO Donaukanal | Bike combi transport Danube Canal – Modern city logistics by water and bike |
| | Smart-Rail | Smart Supply Chain Orientated Rail Freight Services |
| Other | AIDA-F | Potential interdisciplinary approaches for organisational innovations in the transport of goods |
| | WIFAS | System for estimating the impact of mission-orientated research funding programmes |

Mobility of the Future

Thematic Field

Mobility of Goods

Funding opportunities for research, technology and innovation (RTI)



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Programme owner of Mobility of the Future

Unit III/14 - Mobility and Transport Technologies

Contact for the innovation field Mobility of Goods

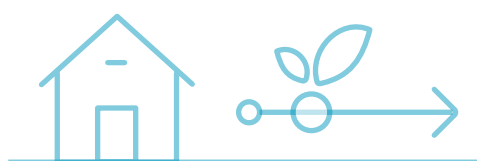
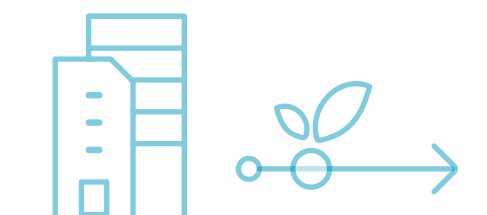
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Mobility of Goods. Research fields and topics up to 2020

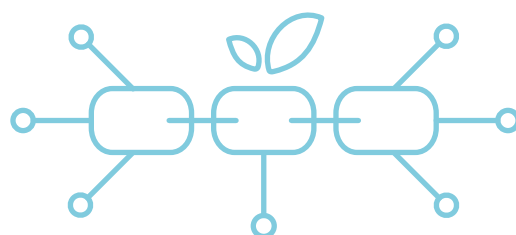
RTI roadmap for the innovation field Mobility of Goods

A roadmap based on research, technology and innovation policy for orientating the innovation field of the Mobility of Goods was created in the period from December 2014 to September 2015 within the scope of the Mobility of the Future programme. Part of the process involved holding an online survey of applicants from the previous open calls relating to the Mobility of Goods, a workshop with representatives of research institutions in cooperation with LRA (Logistics Research Austria), interviews with representatives of companies in the area of the transport of goods and transport logistics as well as a final stakeholder workshop.

The result of the process highlights the research fields and research topics as well as the need for research funding and support measures in the innovation field of the Mobility of Goods for the open calls relevant to the Mobility of Goods in the Mobility of the Future programme until 2020. The research fields and research topics are presented on the next page.

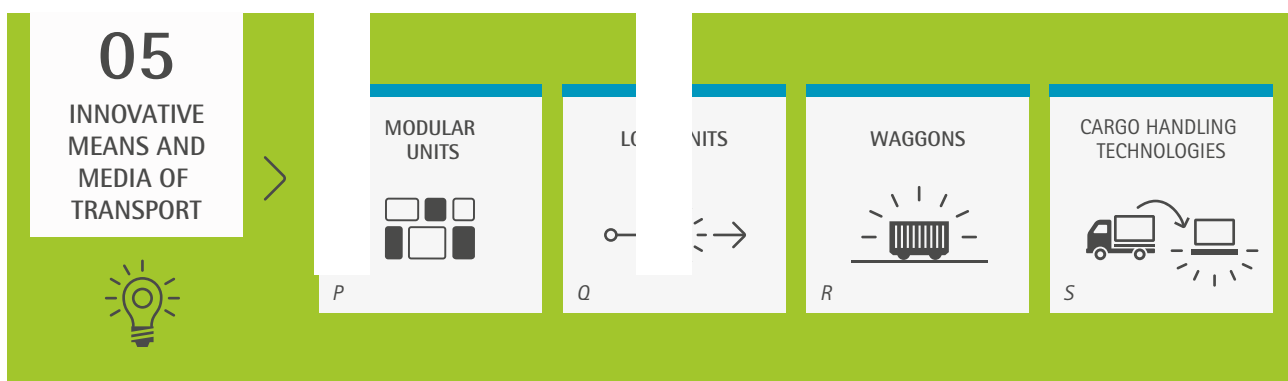
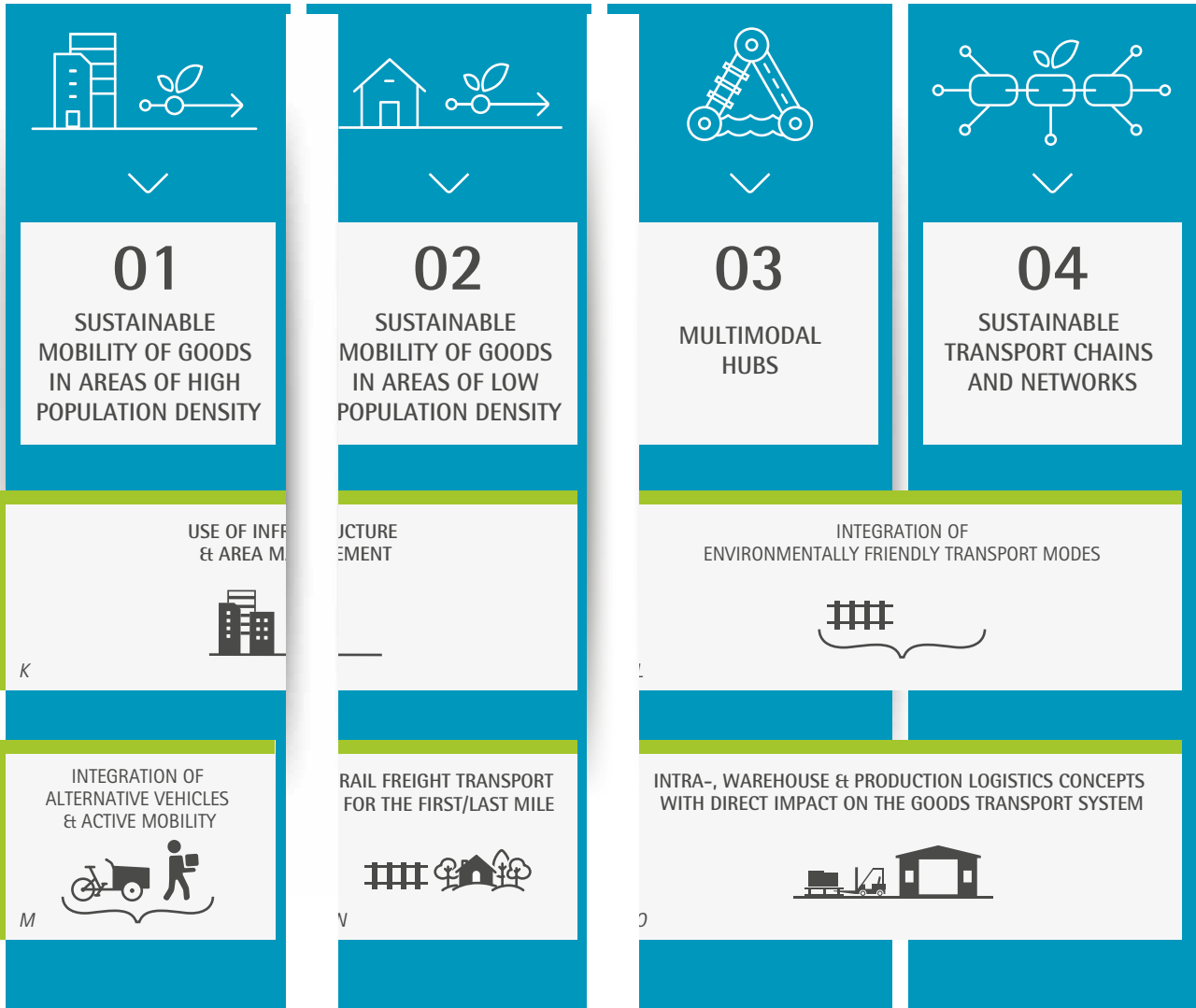
Open call focal points on research topics and research fields from the RTI roadmap for the Mobility of Goods are planned in the Mobility of the Future programme for Spring 2016, Autumn 2017, Spring 2019 and Autumn 2020.

Long version of the RTI roadmap for the Mobility of Goods (in German):



Research Fields and Research Topics





I. National RTI funding instruments.

Cooperative R&D projects

Cooperative research and development projects are cooperations between several consortium partners which collaborate on a common project with defined research and development objectives. The research and development project can be set up either as Industrial Research (high development risk and far from the market), or as Experimental Development (low development risk and close to the market).

Exploratory study for preparing a cooperative R&D project

Exploratory studies serve to prepare for research, development and innovation projects (R&D&I). In particular, they should sound out the meaningfulness of future R&D&I projects and can support the creation of the concept in the case of planned lighthouse projects.

Lighthouse projects

Lighthouse projects are extensive, cooperative research and development projects involving several consortium partners with a signal effect for one or more branches of industry.

Innovation network

Innovation networks define themselves through the sustainable cooperation of several consortium partners which carry out application-orientated RDI projects in a common process within a network. Collaborating in a network should enable all consortium partners to achieve a significant and lasting leap in quality and innovation.

Innovation lab

Innovation labs enable institutions or organised groups of independent partners to gain open access to tangible (research-related assets, research space, etc.) and intangible (personnel resources, organisational structures, etc.) RTI infrastructure and/or specific expertise. They offer an organisational basis for the transfer of knowledge and for collaborating on innovation projects, and support access to users within the scope of a real development environment.

Dissertations

The initiative is currently running under the research partnerships programme financed by the National Foundation for Research, Technology and Development.

Full details at:
<https://www.ffg.at/programme/forschungspartnerschaften>.

Details on the national RTI instruments

| | Exploratory study | Cooperative R&D project | Lighthouse project | Innovation network | Innovation lab |
|-------------------|---|--|---|--|---|
| Funding | max. €200,000 | min. €100,000 - max. €2 million | at least €2 million | max. €500,000 | Investments: max. funding: €1.5 million, operation: max. funding/year: €150,000 |
| Term | max. 12 months | max. 3 years | min. 2 and max. 4 years | 1 to 2 years (in well justified cases max. 3 years) | max. 10 years |
| Applicants | Individual applicants or as a cooperative project | Consortium with consortium leader | Consortium with consortium leader | Consortium with consortium leader | Operator organisation (legal entities, partnerships or sole traders) |
| Features | Large company only in cooperation | min. 2 companies or 1 company + 1 research institution | min. 2 companies (of which min. 1 SME) and 1 research institution | min. 4 companies, of which 3 SMEs (optional RDI institutions and/or intermediaries as consortium partners) | The operator organisation will be funded with max. 50% of the costs of investment and operation |

Funding ratios

| | Exploratory study | Cooperative R&D project or lighthouse project | | Innovation network | Innovation lab |
|--|-------------------|---|-----------------|--------------------|----------------|
| | | IR ¹ | ED ² | | |
| Small companies | 70% | 80% | 60% | 60% | 50% |
| Medium-sized companies | 60% | 70% | 50% | 50% | 50% |
| Large companies | 50% | 55% | 35% | 35% | 50% |
| Research institutions and intermediaries within the scope of their non-business activity | 80% | 85% | 60% | 60% | 50% |
| Other non-economic institutions within the scope of their non-business activity | 80% | 80% | 60% | 60% | 50% |

Contact:

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 Email: svenja.lembke@ffg.at

Additional information about national open calls:



¹ Industrial research

² Experimental development

II. European RTI funding options

Horizon 2020 – Calls

The EU programme for research and innovation (2014–2020) focuses continuously on research and development aspects on the topic of "Smart, green and integrated transport", including the transport of goods and transport logistics.

Link:

<https://www.ffg.at/europa/h2020/verkehr>



Shift2Rail – Open Calls

Annual open calls for non-JU members are planned until 2020. Open calls will also focus on the topic of "Sustainable & Attractive European Freight Transport".

Link:

<http://shift2rail.org/>



Details on the European instruments

| | Research & Innovation Actions (RIA) | Innovation Actions (IA) | Coordination & Support Actions (CSA) |
|----------------|---|--|---|
| | Research measures | Innovation measures | Coordination and support measures |
| Direct costs | 100% of the total project costs eligible for reimbursement | 70% of the total project costs eligible for reimbursement, except for non-profit organisations: 100% | 100% of the total project costs eligible for reimbursement |
| Indirect costs | Indirect eligible costs shall be determined by applying a flat rate of 25 % of the total direct eligible costs, excluding direct eligible costs for subcontracting and the costs of resources made available by third parties which are not used on the premises of the beneficiary, as well as financial support to third parties. | | |
| Applicants | At least three legal entities. Each of the three must be established in a different EU Member State or Horizon 2020 associated country. All three legal entities must be independent of each other. | | At least one legal entity established in an EU Member State or Horizon 2020 associated country. |

Contact:

Austrian Research Promotion Agency
National point of contact for smart, green
and integrated transport
Hans Rohowetz
Phone: +43 (0)5 7755- 4303
Email: hans.rohowetz@ffg.at

**Additional information on
European open calls:**



III. Tools for supporting the project development

Guidelines for the development of RTI projects in the area of the Mobility of Goods in cities

The evaluation tool developed within the scope of Mobility of the Future is intended to support the development and implementation of research and development projects in the areas of the transport of goods and logistics in cities as well as the transition of the project results to the implementation phase. It offers clear, measurable and assessable criteria that can be used for the development of research and development projects in the area of Mobility of Goods in cities.



Guidelines for the Mobility of Goods (in German):

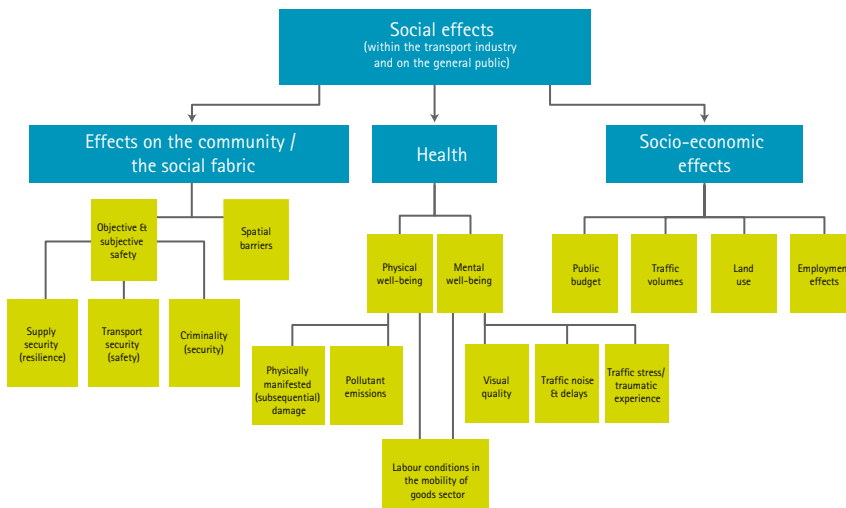


Assessment tool for the Mobility of Goods (in German):



Model for estimating the social effects of the Mobility of Goods

Anticipating social effects is a frequently occurring challenge when developing a project. The impact model should support the better estimation of societal and social effects in future research and development projects.



Impact model for the Mobility of Goods (in German):



