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# XVI SCIENTIFIC-EXPERT CONFERENCE ON RAILWAYS RAILCON '14



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# CONTENTS

## Plenary Session

- PRECEDENT-FREE FAULT LOCALIZATION FOR HIGH SPEED TRAIN DRIVE SYSTEMS I  
Asad UL HAQ, Dragan ĐURĐANOVIĆ  
University of Texas at Austin, Austin, USA
- IMPROVING SERBIAN RAILWAYS: POLICY OPTIONS AND STRATEGIC DIRECTIONS XI  
Nena TOMOVIĆ,  
JSC Serbian Railways, Belgrade, Serbia  
Snežana PEJČIĆ TARLE  
Faculty of Transport and Traffic Engineering, Belgrade, Serbia
- IMPORTANCE OF COTIF TO INTERNATIONAL TRAFFIC XVII  
Bas LEERMAKERS, Dragan NEŠIĆ  
OTIF, Bern, Switzerland

## Rolling stock

- 1.1. EXPERIMENTAL RESEARCH OF CHARACTERISTICS OF IMPROVED TYPE OF COMBINED TUBE ENERGY ABSORBER 1  
Jovan TANASKOVIĆ, Dragan MILKOVIĆ, Vojkan LUČANIN, Žarko MIŠKOVIĆ  
Faculty of Mechanical Engineering, Belgrade, Serbia
- 1.2. HYBRIDIZATION- THE WAY OF DECREASING CARBON DIOXIDE EMISSION AND FUEL ECONOMY 5  
Martin MIKOLAJČÍK, Daniel KALINČÁK  
University of Žilina, Slovakia
- 1.3. NEW STADLER “FLIRT3” EMU’S FOR SERBIAN RAILWAYS 9  
Fadi KHAIRALLAH  
Stadler Bussnang AG, Bussnang, Switzerland
- 1.4. REQUIREMENTS FOR CUSTOMER FRIENDLY RAILWAY INTERIORS 13  
Bernhard RÜGER  
Vienna University of Technology, Vienna, Austria
- 1.5. EXPERIMENTAL MEASUREMENTS AND NUMERICAL SIMULATIONS OF THE WHEEL-RAIL ANGLE OF ATTACK 17  
Dragan MILKOVIĆ, Goran SIMIĆ, Jovan TANASKOVIĆ, Živana JAKOVLJEVIĆ  
Faculty of Mechanical Engineering, Belgrade, Serbia
- 1.6. DETERMINATION OF FRICTION HEAT GENERATION IN CONTACT OF WHEEL-RAIL SET USING FEM 21  
Aleksandar MILTENOVIĆ, Milan BANIĆ, Dušan STAMENKOVIĆ, Miloš MILOŠEVIĆ, Miša TOMIĆ  
Faculty of Mechanical Engineering, Niš, Serbia
- 1.7. ANALYSIS OF THE RESULTS OF THEORETICAL AND EXPERIMENTAL STUDIES OF FREIGHT WAGON FALLS 25  
Svetoslav SLAVCHEV, Kalina GEORGIEVA, Valeri STOILOV, Sanel PURGIĆ  
Technical University, Sofia, Bulgaria
- 1.8. ABOUT THE PROCESS OF BRAKED WEIGHT LOSS IN THE FREIGHT TRAINS 29  
Kiril VELKOV, Oleg KRASTEVA, Sanel PURGIĆ  
Technical University, Sofia, Bulgaria
- 1.9. ISSUES OF WAGON MODELLING WITH SHELL ELEMENTS 33  
Svetoslav SLAVCHEV, Kalina GEORGIEVA, Valeri STOILOV  
Technical University, Sofia, Bulgaria
- 1.10. FRICTION CHARACTERISTICS OF THE FRICTION PAIRS IN DISC BRAKES 37  
Vasko NIKOLOV  
Todor Kableshkov University of Transport, Sofia, Bulgaria

## BAGGAGE TRANSPORT SYSTEM – NEW SOLUTION

Bernhard RÜGER <sup>1</sup>

**Abstract** – Baggage features the highest value regarding traffic flexibility. This fact is one of the main reasons for people to choose their car instead of public transport, either regarding their daily routine or journeys. Due to the complexity of an intermodal „public luggage transport system“ which ideally works simultaneously to passenger transport, as a first step an exploratory project will be launched. The project aims to survey all customer requirements as well as technical and logistical challenges and as a consequence generate a list of requirements for prospective research and development projects.

**Keywords** – baggage transport, passenger needs, expectations, comfort.

### 1. INTRODUCTION

The carriage of baggage shows the highest flexibility value in the railroad and is one of the main reasons why the automobile is chosen instead of the train for travel. However, studies show that through the implementation of a suitable baggage logistics system, very good modal shift effects can be achieved and the train can expect up to a 20% increase in passenger numbers.

### 2. PROJECT IDEA

The project "BaggageLess" sponsored by the Austrian Research Promotion Agency (FFG) and the Austrian Federal Ministry of Transport (bmvit) aims to develop a suitable system for baggage transport that can be implemented for everyday traffic as well as for longer travel. This means a decisive simplification for the customer and can also change the modal-split in favor of public transport.

The demands and challenges, which will be defined in the project, orient themselves on the following scenario:

Relevant first and foremost for customers is the interface with the system, i.e. the baggage transfer and return procedure. First and foremost from the point of view of the operator are all of the phases in between, i.e. from the time the operator receives the baggage, through baggage handling and transport, up to the return to the customer.

The basic structure of what the most flexible baggage logistics system can look like is depicted in figure 1.

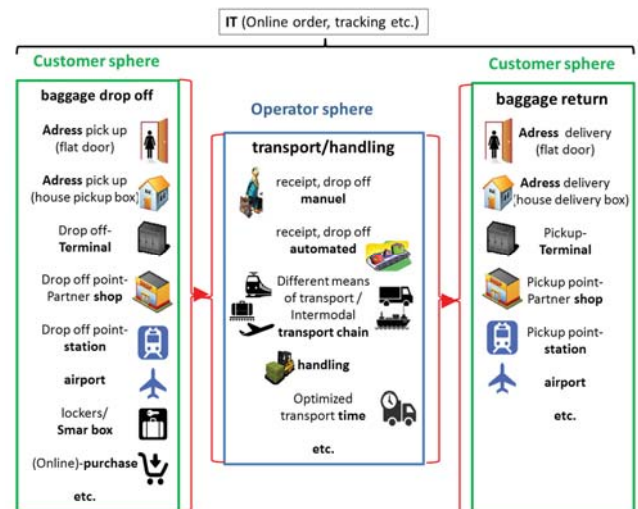


Fig. 1: Schematic depiction of a baggage logistics system

The baggage logistics system is modularly structured. For example, in the area of baggage transfer there must be different transfer possibilities from which the customer can choose. There are many conceivable scenarios which are described below:

- **Pickup/Delivery at the house door:** This service is already offered in the area of package delivery (at this time only for delivery) as well as in railroad transport house-house-baggage service. However, it must be optimized as it is at this time expensive and inflexible.
- **Pickup/Delivery at a house delivery enclosure (house-pickup/delivery box):** Analogous to house delivery enclosures (post boxes), large boxes make possible the delivery as well as

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pickup of bulk freight such as baggage; but also packages in cases where the personal presence of the customer is not possible. Due to the necessary size of the boxes, it is hardly possible to provide every housing unit with its own box.

A system must be designed which is flexibly utilisable. For example, several small boxes can be combined to achieve the required larger size. At the same time it must be ensured that only the currently authorized persons (staff of the delivery/pick up services in combination with the respective piece of baggage or the owner) have access to the contents. A house box would have the advantage that both baggage and other packages which do not fit into a conventional house delivery enclosure could be transferred even if no one is personally present to meet the delivery/pickup service. At the same time, this box can also be used for the pickup of any pieces of baggage or packages. On one hand, because recipients do not need to go at fixed opening times to the nearest post office or the nearest partner shop to pick up deposited packages; this system would be, in the area of normal package delivery, a great convenience for the customer. On the other hand, it offers the implementation of a completely new service. The house box makes it possible to send packages without having to go to a post office.

The desired pickup of pieces of baggage or packages can be ordered over the internet; whereby, the box automatically informs the delivery service as soon as it is filled.

- **Central Drop Off Terminals:** At central points (hot spots) analogous to baggage lockers, innovative baggage deposit systems can be set up as short-term interim storage of baggage (e.g. while shopping) but the same time, as reception or retrieval points for baggage transport. These central drop off terminals can for example, include smart-boxes (see below) for the storage of diverse pieces of baggage.
- **Smart Boxes:** A key research question describes the necessary standardization of packaging and transport units. In particular it must be examined whether by baggage transport, transport containers such as for example the above mentioned SmartBox can be used system-wide or what additional requirements for style and (re) design of the pieces of baggage are needed. Baggage can be stored in the SmartBox. The SmartBox contains a chip and a small display. It is at any time possible to configure the SmartBox (e.g. using a smart phone or terminal) so that at a desired time it can be set to a defined goal. This system can then handle many small pieces of

baggage (e.g. while shopping) as well as travel baggage.

- **Special challenges in the logistics chain:** People travel independently using available systems of public transport and make travel breaks. Along the way they do things which are not directly connected to their travel purposes, make detours and are not time bound to the transportation offered.

The baggage being transported parallel to the traveler must be taken over by the transport service provider, collected, stored, transported, sorted and once again separated for the individual traveler. This requires not only appropriate systems but also minimization of processing time. Therefore, in general the baggage arrives at its destination at a different time than the traveler; and that implies the need for storage at the destination and the design of a pickup system by delivery service or individual.

### 3. OPERATOR MODEL

The innovation with respect to a future baggage logistics system is: that similar to multimodal personal mobility, a corresponding and accompanying freight mobility will be created. Thus there will be a complete decoupling of personal mobility from freight transport.

Similarly, as currently flexible systems are used in the framework of direct personal mobility, be it classical public transport or multi-purpose rental systems such as Car2Go or City Bike, in which at almost any time a vehicle can be used and then parked; it should also be possible in the future to drop off baggage at an adequately available transfer point and have it transported to the desired destination. This system will allow in the future a significant increase in the flexibility of personal mobility; since the choice of transport as to whether or how much baggage is conveyed must not be considered, but limiting baggage can be dropped off at any time.

In the field of energy supply as well as telecommunication and public transport it is increasingly common for infrastructure and operations to act separately. This means for example, that a telecommunications provider does not have its own infrastructure but makes use of alternative infrastructure and only offers service "telephony". An operator model specializing in baggage services can look similar.

There are a variety of companies that specialize in the field of freight mobility. These are both shippers who transport freight using various means of transport, as well as traditional mail and package delivery. Also, other service facilities such as baggage deposit systems at train stations etc. should be

considered. Because the requirements for baggage transport are very diverse, it is not useful to create a completely new system. On the contrary, existing service providers including their infrastructure must be integrated into the system and their systems optimized to ensure the best possible efficiency. For example, it can be a separate operator who is responsible for all matters relating to the transportation of baggage. The booking of service takes place through this operator; the operator takes care of the smooth flow of transport and is also the sole point of contact in all matters. The operator itself has no available infrastructure in the true sense but accepts the intermediary and coordinator role and depending on the specific requirements uses various providers and service facilities (see Fig. 2).

This system also gives rise to a better utilization of existing systems; as free capacity can be used in a more targeted way.



Fig. 2: Possible Operator Model

Those accumulated measurements can be used in order to design adequate storage between the seat backs or baggage racks.

Analysis show that there are two main issues regarding baggage room. First passengers do not want to lift their luggage, and especially not to the height of overhead storage. This attitude is more common amongst women and increases with age.

Second and due to security reasons, passengers wish to have their luggage in visual range. If these requirements are not met, passengers are very willing to store their luggage in not-intended place, like seats or corridors. This behaviour leads to a lower quality level and to a loss in capacity due to occupied seats.

#### 4. CONCLUSION

The actual innovation, which is discernible from the outside, is that a fully adequate replacement for the trunk of the private automobile will be created. Only when the same flexibility can be created that

one's own automobile trunk provides, is it possible to leverage sustainable mobility forms such as public transport to make the required breakthrough!

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