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Written By	**Magnus JV Olbäck (Volvo)** Anika Lobig (DLR) Agnes Eiband (Fraunhofer IML) Ton Bertens (VEG) Eric Fehen (UIRR)	2018-03-31
Checked by	**Anika Lobig (DLR)**, internal review Agnes Eiband (Fraunhofer IML) Ton Bertens (VEG)	2018-04-25
Approved by	Cor van der Zweep (Uniresearch) Ben Kraaijenhagen (MAN) - Coordinator	2018-04-30
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Publishable Executive Summary

The aim of WP4 on 'Smart loading units' (SML's) is to investigate the potential to improve transport efficiency by flexible solutions for load optimization and load efficiency of vehicle combinations, considering the use of single trucks, tractor and semitrailer combinations (16.5 m), and truck, dolly and semitrailer combinations (25.25 m). The WP aims to develop and design solutions for prioritized transport segments where transport flows are considerable and where the impact of efficiency improvements is high. Flexible solutions for load optimization and load efficiency of the relevant European vehicle portfolio (vehicle combinations e.g. single trucks, tractor and semitrailer combinations (16.5 m), and truck, dolly and semitrailer combinations (25.25 m)) have to be developed to improve transport efficiency of freight and logistics in a multi-modal context. Solutions for prioritized transport segments must be developed and designed where transport flows are considerable and where the impact of efficiency improvements is high.

In order to achieve the various goals of the task 4.1 the involved partners based their research methodlogy on three aspects: (1) a literature analysis of all relevant studies, projects, articles, (2) organisation of specific workshops and condution of bi-lateral interviews with relevant stakeholders and (3) collection of requirements from other AEROFLEX WPs. For the purpose of this project, the concept of 'Smart Loading Units' (SMLs) should at least cover the following features and functions: intelligent and safe, full access security, load optimisation, fast interoperability, aerodynamic design, telematics-friendly and fit for intermodal.

The analysis of the various Combined Transport markets, in particular the road-rail combination demonstrates clearly that the most utilised loading units is the standardised maritime container (20', 30' and 45'), both in international and domestic CT (maritime hinterland transport). However, the continental CT market with swap bodies and semi-trailers is in progress with a clear trend of shiting more semi-trailers onto rail. It is agreed that within the AEROFLEX project the new smart loading unit should be compatible with rail wagons and ferries and should be designed and compatible for vertical craning. Among the 1,000 available terminals in Europe, it is that the main used transhipment technologies in combined transport terminals are still cranes and reach steacker necessary for the the vertical transhipment). However, it has been recommended that the SML should be tested and demonstrated for both types of handlings (vertical and horizontal).

The digitalisation of the transport freight market is in progress thanks to namely the transformation of the assets (semi-trailers, boxes, wagons, cranes, locomotives) into smart devices necessary to fullfill the requirements of the Physical Internet concept and vision as developed by the LSPs in the ALICE platform. The end-users will benefit from these digitalised assets of a bundle of information (tracking and tracing, energy consumption, mileage…) allowing a fully (automatic) optimisation of the logistic routings taken into account the energy consumption and environmental footprint.

Use cases relevant for the AEROFLEX project have been identified and discussed with the stakeholders. These cases are based on four criteria that can be mixed up (1) a volume -based scenario (2) a weight-based option, (3) an intermodal case and (4) a distance-based case (urban, medium and long-haul transport). In this task, the pre-seleted use cases (10 in total) have been briefly described at this stage. The final selection will be validated by the General Assembly in May 2018 in cooperation with the sounding Board. The aim is to select at least three use case with one covering intermodal transport. For all use cases, specific preliminary KPI's have been chosen and registered in six specific categories: transport efficiency, operational parameters, vehicle uptime, loading parameters, safety and limitations and digital and IoT. The final list of KPIs will be elaborated based on the input of the markets (sounding board) and of the other WPs.

Thanks to the bilateral contacts and organization of workshops with LSPs and other stakeholders of the transport chain, a first catalogue of user requierments has been established and split into categories (logistic operational aspects, operational time, flexibility, (smart) oading units). All these requirements must be taken into consideration when choosing the use cases of the AEROFLEX project.