



Newsletter 06/2025



We're thrilled to share the latest updates on our project, FP1 MOTIONAL, which is set to transform rail travel across Europe. Our mission is simple yet ambitious: to make rail the preferred mode of transport by enhancing planning and operational management through digital innovation.

By participating in Europe's Rail initiatives, we're not just improving rail services; we're creating societal impact and environmental benefits. Our collaboration with internationally recognized partners accelerates the adoption of digital technologies and innovations, ensuring that the railway system meets the transport challenges of tomorrow. Our vision is to make rail the backbone of a multimodal transport system for both passengers and freight.

Demonstration Phase

Exciting Updates from FP1 MOTIONAL!

Since December 2024, FP1 MOTIONAL project has entered its demonstration phase, advancing through 10 Work Packages (WPs) to enhance Europe's rail systems. Kick-off meetings across European cities are setting the stage for demonstrations.

Project Overview:

FP1 MOTIONAL aims to improve rail planning and operations, positioning rail as Europe's preferred transport mode. It focuses on an interoperable, resilient system integrating all services, including last-mile operations, through digitalization. A key goal is developing a European Traffic Management System (TMS) for a Single European Railway Area (SERA).

Workstreams:

• **WS1:** Focuses on planning, operations, and integration, including linked timetables and door-to-door mobility services.





• **WS2:** Develops digital enablers like Digital Twins, interoperable data-sharing, and communications infrastructure.

Launched in December 2022, the project moved from specification (2023) to development (2024) and is now in a hybrid development-demonstration phase until 2026, delivering reports on technical developments, demonstrations, and designs.

The activities during the demonstration phase started in December 2024 and will continue until June 2026.







Kick off Meetings

Kick off Meeting of WP7

FP1 MOTIONAL scope ncludes the development of algorithms and simulation methods to optimise timetables, enhancing capacity, and effectively manage rail services. The demonstration of these algorithms is the scope of Work Package 7 (WP7) – "Demonstration – Decision support for planning and timetable optimisation". WP7 kicked off in January 2025 in the beautiful city of Rome.

The two-day event was hosted by Siemens and led by the WP7 leader, Dennis Huisman from NSR. The meeting started with an overview of the WP7 scope and continued with presentations of the demonstrations plans by the partners involved in this WP. The subsequent plenary session facilitated the exchange of ideas between partners and addressed broader topics related to the demonstration phase. The focus of the second day was to identify the key performance indicators to be validated during the demonstrations.

This event was successful in aligning efforts and objectives for the next phase of the FP1 MOTIONAL project in improving both long-term and short-term timetabling.







Kick off Meeting of WP9

Work Package 9 (WP9) of FP1 MOTIONAL aims at exploring how improved feedback loops between operations and planning can result in more robust and optimized timetables and a more **resilient and connected 'real-time' rail network**.

The WP9 kick-off meeting, held on 23rd and 24th of January 2025 at the CAF headquarters in Madrid, brought together key players from TRV, CAF, PRORAIL, ADIF, NSR, SNCF, INDRA, and KTH.

Over the two-day event, it was discussed the overview and current status of the related developments delivered in WP8, demonstration planning, key milestones timeline and next steps for validation and dissemination events happening across Europe.



The demonstrators to be delivered in WP9 will support an assessment of the impact on rail operations of cutting-edge technologies such as: Connected Driver Advisory Systems, Automatic Train Operation, ETCS Level 2 with optimized braking curves, and ETCS Hybrid Level 3.

In particular, this assessment will look into how these innovations can enhance capacity, punctuality, and overall efficiency of rail operations while paving the way towards a more efficient and reliable rail system.

Isabel Maseguer, CAF Signalling a.e. CAF

Member of WP8/9





Kick off Meeting WP16

FP1 MOTIONAL project's Work Packages 15 and 16, with the scope of "Linking TMS to ATO/C-DAS for optimised operations", held their 5th physical meeting on the 3rd and 4th of December 2024. Hosted by AŽD Praha at their headquarter in Prague, this meeting was attended by 29 participants from all WP 15&16 partners: ADIF, AZD, CAF, CEIT, INDRA, INECO, MERMEC, NRD, NSR, PRORAIL, RISE, STS, TRV, TUD, UT and VTI.

The focus of the discussions during the first day of this meeting was on the progress and results of the WP15 developments and the TRL 4 validation results, as reported in deliverable D15.2 'TMS and ATO/C-DAS Timetable Test & Simulation Environment'.



These included a presentation from WP15 Leader Rob Goverde (TU Delft/ProRail) on the TMS-ATO functions, interactions and requirements based on the state of the art for these aspects. Other discussions highlighted advancements in the interaction between railway traffic management and ATO/C-DAS, including tools like the Real-Time Traffic Plan Updater, urban rail Traffic Regulator, mainline Train Path Envelope Generator, ATO-enhanced traffic management, TMS-ATO integration, and human-centred simulation tools.

The presentations from WP16 leader Egidio Quaglietta (TU Delft/ProRail) and co-leader Camiel Simons (NSR) kicked-off the second day of this event. Subsequently, the plans for the WP16 demonstrations were presented by the lead partners, highlighting the impact of the characteristics specific to each location where the demonstrations will be held.





Kick off Meeting WP18

The WP18 team officially launched its activities with a kick-off meeting in Vienna at the ÖBB-INFRA HQs in Vienna. The meeting brought together representatives from ÖBB-INFRA, NRD, ENYSE, HACON, STS, AZD, INDRA, MERMEC, and SNCF, for fruitful discussions on enhancing rail planning. The focus was on testing algorithms that support decision-making and automation in rail traffic management, aiming to optimize operations and resolve conflicts in real time.

The two-day event centred around defining the scope of the demonstrators, with each company presenting its role in the development process, aligning on working methods, reporting, and benchmarking approaches to assess the effectiveness of the upcoming solutions.



The objectives of WP18 are to enhance automated decisions and decision support for traffic management optimisation. As part of WP18, eight demonstrators will be developed across different European cities, providing a real-world testing ground for these innovations. These demonstrations will play a crucial role in validating the proposed solutions and ensuring they meet the needs of the rail sector.

Kick off Meeting WP21: Paving the Way for Multi-Modal Transport Integration

The scope of Work Package 21 (WP21) of FP1 MOTIONAL project is to demonstrate the solutions for integrating rail with other transport modes developed by the project in other related work packages.

FP1 MOTIONAL 2# Newsletter





The kick-off meeting for WP21 took place early this year in Hannover, Germany. Hosted by Hacon and led by WP21 leader Marco Ferreira from Siemens, the event brought together many European partners, STS, DB, GTSD, Hacon, CFL, among others.



The engaging and fruitful discussions held at this meeting focused on the planning, execution, and evaluation of the upcoming demonstrations. The solutions to be demonstrated in WP21 aim to seamlessly integrate rail services with other transport modes and include B2B intermodal services for journey planning, reservation, ticket distribution, disruption management, financial services, and data management.

The demonstrations will be held in various locations across Europe including Madrid, Lodz, Luxembourg, Germany, Sweden, France, and Italy.

Stay tuned for more updates on the upcoming demonstration events!





Participation at events

Contribution from Europe's Rail FP1 MOTIONAL at Transport Ticketing Global

As part of Europe's Rail, we are working on the technical standard of the Open Sales and Distribution Model (OSDM) to promote mobility in Europe through simplified ticket booking and improved travel options. Vittorio Carta (Manager Transport Policy Europe, Deutsche Bahn - DB) presented this topic at Transport Ticketing Global in London (4th and 5th of March) and the work developed in FP1 MOTIONAL. Vittorio presented the numerous advantages that OSDM offers for railroads and passengers.

Thanks to OSDM and from 2025, it will gradually be possible to seamlessly purchase tickets for an international train journey on several railroads in a single transaction. DB already works with over 20 European railroads and associations to issue tickets. However, due to a lack of uniform standards, it is not yet possible to obtain price information for some European connections. In future, passengers will even be able to choose a suitable option from a range of different fares for journeys with several rail companies. This will make booking a cross-border rail journey just as easy as buying a ticket for a domestic connection. And if a connection at no additional cost.

OSDM also supports the integration of different modes of transport such as trains, buses and streetcars, making it easier to plan and book through trips. Overall, OSDM helps to make travel more convenient and accessible for passengers and promotes seamless and sustainable mobility in Europe.

In order to realize further passenger growth, a number of hurdles need to be addressed politically. These include investment in new high-speed infrastructure, greater harmonization across Europe, for example of approval procedures, train path assignment or ETCS expansion, as well as fair competitive conditions between modes of transport, such as equal taxation of electricity and kerosene or equal costs for the use of infrastructure.

Best Paper Award 2025 at RailDresden 2025

Yahan Lu, Rob Goverde, Gábor Maróti, Dennis Huisman received the Best Paper Award at the 11th International Conference on Railway Operations Modelling and Analysis (RailDresden 2025), held in April 2025. Their paper entitled "An iterative heuristic for strategic timetabling with integrated passenger routing in railway networks" was presented at RailDresden by Yahan Lu from TU Delft (on the picture, she is the fourth person from the right). This research was part of Work Package 6 of Europe's Rail Flagship Project 1 "Motional".

In this paper, the authors developed an iterative heuristic to construct strategic timetables. Strategic timetables are timetables for 5 - 20 years ahead, where not all details of the rail infrastructure are considered. Instead, these timetables have as goal to provide input for investments in e.g. infrastructure and rolling stock. A strategic timetable can be evaluated on different aspects. In this paper, the authors choose for the total generalized travel time summed over all passengers, a common KPI to indicate the quality of a timetable. The generalized travel time of a passenger consists of the total travel time from its origin to its destination. It





includes in-train time, the waiting time at the station and transfer times between two trains (if needed). In addition, a transfer penalty is included. By minimizing the total generalized travel time, the best timetable from the perspective of all passengers together can be computed.



The method developed in this paper, tries to compute such a timetable. From a computational perspective, it is very hard to find the best timetable. Therefore, a heuristic (i.e. an algorithm that is able to compute a reasonable solution in reasonable computation time) has been developed to compute a good timetable. This heuristic has been tested on real-life instances of Netherlands Railways (NS) and provided good results.

For more information about the conference and the selected best papers, see https://www.iaror.org/2025/04/10/best-papers-of-raildresden-announced/ "





FP1 MOTIONAL Recap: What You Need to Know LAST FP1 MOTIONAL EVENT: Mid-term event in Madrid, Spain



On 29th October 2024, over 150 participants joined our FP1 MOTIONAL Mid-Term Event. The gathering focused on advanced railway planning, multimodal integration, and digital enablers, highlighting the project's progress.

Curious about our Project objectives?

Curious about the latest developments in **FP1 MOTIONAL**? Our team has been working to advance mobility management, multimodal environments, and digital enablers.

Want to learn more?

Watch our latest video on the **Europe's Rail Joint Undertaking YouTube channel** to see how we are shaping the future of smart mobility.







We're also gearing up for our grand finale event in Summer 2026. Stay tuned for more updates in our upcoming newsletters. Meanwhile, if you missed our previous event, make sure to catch the highlights in our mid-term event video.

Disclaimer:

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