
Opportunities of Digitalisation for Transalpine Intermodal Freight Transport

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Executive Summary

The workshop "Opportunities of Digitalisation for Transalpine Intermodal Freight Transport" congregated representatives from various sectors to address the digitisation of Combined Transport (CT). Insights on bolstering intermodal transport were shared by German, Bavarian, Austrian, and Italian representatives, highlighting state support and showcasing projects enhancing freight centres and port infrastructures.

Presentations from Ministries of the Alpine Region revealed commitments to digitalisation and infrastructure development, with a clear directive towards sustainable freight transport systems. Notably, Austria's strategic initiatives aim to decouple economic growth from freight transport growth.

A panel discussion explored the intricacies of digitalising CT, touching on the multitude of stakeholders involved in freight transport compared to passenger rail, the challenges of data standardisation and transparency, and the critical need for reallocation of rail tracks to establish efficient freight rail networks. The success of dynamic slot management systems, which adapt to fluctuating estimated time of arrival information for trucks and trains, was discussed as a testament to the feasibility of such digital initiatives.

Companies active in CT shared their pioneering digital projects, from data platforms to terminal-truck communications, illustrating a collective drive toward streamlined operations and environmental digitalised stewardship. The discourse underscored the essential role of change management and awareness, with funding programs to promote CT and digital services potentially heightening the acceptance and ease of use for rail freight transport.

Additionally, discussions emphasised the need for trust in digital platform providers, as the sharing of sensitive data such as train capacities might affect market pricing or be misused by competitors. The success of private white-label providers in transport tracking services exemplified the importance of offering clear value propositions to all stakeholders.

The workshop also considered regulatory pressures, such as Austria's mandate to assess the overall viability of rail transport, as a positive influence on the modal split. However, there was a general consensus to maintain a balanced perspective on regulation in the transport market.

Lastly, the workshop highlighted the security risks associated with data sharing and high data transparency, noting the need to safeguard sensitive logistics information within critical infrastructures like ports or along entire supply chains. Despite these concerns, the risk of stifling innovation due to excessive caution was acknowledged, emphasising the importance of exploring and implementing new digital solutions to demonstrate their full potential.

1. Welcome & Introduction

The workshop "Opportunities of Digitalisation for Transalpine Intermodal Freight Transport" by the Transport Working Group of the Alpine Convention took place on March 7, 2024, from 9:30 AM to 5:00 PM, at the Port of Nuremberg. Alongside the members of the Working Group, the German Federal Ministry for Digital and Transport, as the co-organiser (together with the Bavarian State Ministry of Housing, Construction and Transport), invited corporate representatives to identify potentials and challenges within the transport economy for the digitalisation of CT. The outcomes of the workshop will contribute to goal no. 2.4 of the Transport Working Group's 2023-2024 mandate, "Assess the potential of combined transport for the modal shift in alpine crossing freight transport."

The workshop featured a diverse group of experts from several European ministries and organisations associated with transportation and logistics. The workshop opened with welcoming words from Dr. Diana Huster (Federal Ministry for Digital and Transport) and Harry Seybert (Bavarian State Ministry of Housing, Construction and Transport). Representatives from the French Ministry of Ecological Transition included Michel Pinet (chair of the Alpine Convention's Transport Working Group), Anke Möller, and Guy Poirier. The Alpine Convention's Permanent Secretariat was represented by Raphaël Lelouvier. The Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology was represented by Julia Elsinger and Wolfgang Grubert. The private sector's perspective was provided by Marcus Dober | riverside digital agency, Axel Bagszas | Bagszas LogTech, Felix Czerny | ConRoo and Stephanie Grüneis | LKZ Prien GmbH, while Antonella Scardino | North Adriatic Sea Port Authority, Ingmar Schellhas and Peter Schreyer offered insights from the port and terminal industries. From the logistics and transportation companies, Andrea Condotta and Nicola Boaretti contributed from Gruber Logistics and Consorzio ZAI, and Philipp Radlmair from DB Schenker adding to the discussion. Hannes Sobitsch from SWS PS Power Solutions GmbH and Annamaria Andretta from ITALCAM Camera di Commercio Italo-Tedesca e.V. also participated. TX Logistik was represented by Sebastian Ruckes, while CargoBeamer AG was represented by Natalie Knöchelmann. The logistics sector's presence was further reinforced by Ingrid Rossmeier from iSCM | Institut for Information & Supply Chain Management. Klaus-Uwe Sondermann from DX Intermodal GmbH / KombiConsult GmbH was also in attendance. The workshop was moderated by Dr. Rudolf Aunkofer and Dr. Johannes Kraus, both from CNA e.V. | Think Tank for Mobility, Transport & Logistics.

In the morning, representatives from Germany, Bavaria, Austria, and Italy shed light on government funding opportunities for the digitalisation of CT and presented best practice projects at freight villages and port infrastructures. Participants toured the Port of Nuremberg, the largest trimodal transshipment terminal in Southern Germany. In the afternoon session, companies involved in CT reported on exemplary digitalisation projects ranging from data platforms to communication between terminals and trucks. Alongside presentations, panel discussions provided the opportunity to pose questions to the speakers and delve deeper into specific topics.

2. Regional Insights from Alpine Countries

2.1. Insights on activities to strengthen intermodal transport in Germany

Florian Dirr, Federal Ministry for Digital and Transport & Dr. Jakob Lohmann, Bavarian State Ministry for Housing, Building and Transport

The presentation by **Florian Dirr** outlined significant initiatives aimed at bolstering intermodal transport in Germany. It emphasised the Federal Government's commitment since 1998, highlighting the allocation of over 1 billion euros towards the development and upgrading of over 100 private sector CT terminals.

The presentation detailed the current funding guidelines effective until 31.12.2026, focusing on digitalisation, automation of CT terminals, and financial aid covering up to 80% of eligible components, with a 2024 budget of approximately 77 million euros. Further support measures include reducing track access charges and funding for the "Future of Rail Freight" program, among others.

Regulatory support measures for CT were also discussed, including increased total vehicle weight allowances and tax exemptions for vehicles used in CT. Additionally, the presentation covered the European Commission's proposal for amending the combined transport directive, aligning with the European Green Deal and aiming to foster a supportive framework for intermodal freight transport, currently under discussion within the Council of the European Union.

Dr. Jakob Lohmann's presentation on activities to strengthen intermodal transport in Bavaria added the Bavarian state's comprehensive approach, encompassing infrastructure development, project implementation, and political support within the Bavarian Concept for Freight Transport. It underscored the commitment to standardising and digitalising freight transport, including support for non-craneable trailers and enhancing terminal communications. Financial backing for planning of new terminals and connections, like Straubing and InterFranken, alongside initiatives for standardisation and digitalisation, plays a pivotal role.

The Bavarian Concept for Freight Transport aims at shifting transport to rail, outlines flagship projects like new intermodal facilities and digital traffic management on the Brenner Corridor. It also emphasises the importance of skilled labour recruitment and encourages closer collaboration on local logistics challenges. However, the presentation also addressed the local resistance to new infrastructure, such as railroads and terminals, highlighting the necessity for both political backing and industry support to realise these ambitious objectives for a more sustainable and efficient freight transport system in Bavaria.

2.2. Insights on activities to strengthen intermodal transport in Austria

Julia Elsinger, Federal Ministry Republic of Austria Climate Action, Environment, Energy, Mobility, Innovation and Technology

Julia Elsinger's presentation provided insights into Austria's strategic efforts to enhance intermodal transport. It underscored Austria's commitment to decoupling economic growth from freight transport growth, aiming for a modal shift towards more sustainable and energy-efficient modes like rail and inland waterways. The presentation detailed the Austrian Mobility Master Plan 2030, which includes a focus on rail growth and moderate growth for waterways, intending to achieve a targeted modal split of 34% to 40% for rail, aligning with EU objectives.

Key Austrian support measures for intermodal and combined transport were highlighted, including financial incentives for rail freight transport, investment in railway sidings and terminals, and a program supporting CT infrastructure. The emphasis on digitalisation was evident, with initiatives like the ÖBB framework plan 2024-2029 for rail infrastructure digitalisation, Project TARO for automated railway operation, and efforts towards the European Train Control System (ETCS) implementation and digital automatic coupling (DAC).

These efforts demonstrate Austria's proactive approach to fostering sustainable freight transport solutions, aiming for climate neutrality by 2040 while supporting economic growth.

2.3. Opportunities of CT and digitalisation in port areas

Antonella Scardino, North Adriatic Sea Port Authority

Antonella Scardino's presentation detailed the strategic positioning and innovations at the Port of Venice to enhance intermodal transport and address Alpine crossing challenges. The Port of Venice, integral to the TEN-T Network, aims to optimise the Alpine crossings' capacity and modal share amidst rising trade volumes and traffic limitations.

Highlighting the port's comprehensive rail network and traffic growth, Scardino outlined the SIMA integrated rail traffic system as a key innovation, enhancing efficiency and reducing CO2 emissions. Future strategies include infrastructure enhancements, a new intermodal hub, and leveraging digitalisation for improved multimodal transport.

These developments signify the port's proactive approach in capturing increasing transalpine trade flows, especially considering the anticipated traffic doubling in the next 15 years. The presentation underscored Venice's potential as a significant European logistical node, aligning with broader goals for sustainable and efficient freight movement across the Alps.

2.4. Opportunities of CT and digitalisation in freight village areas

Nicola Boaretti, Consorzio ZAI

Nicola Boaretti's presentation showcased Interporto Quadrante Europa di Verona's role in enhancing intermodal transport across the Brenner Pass and leveraging digitalisation within freight village areas. Verona, pivotal on the ScanMed Corridor, facilitates sustainable freight

transport, handling significant volumes through the Brenner, Europe's most frequented Alpine pass.

The presentation highlighted digital innovations like a Safe and Secure Truck Parking Area (SSTPA), a new, more efficient Terminal Operating System (TOS), and projects funded by the Connecting Europe Facility (CEF) for ICT infrastructure enhancements. Future plans include a comprehensive project under Italy's Recovery and Resilience Plan, focusing on cybersecurity, traffic management, and safety within the freight village, aiming for improved logistics integration and environmental impact reduction.

These efforts underscore the strategic importance of digitalisation in managing and optimising intermodal freight flows through critical Alpine crossings, to reduce carbon footprint and impact of environmental pollution on people in Alpine countries.

2.5. Digitalisation Activities in Logistics

Marcus Dober, riverside digital Agentur / Axel Bagszas, Bagszas LogTech

The keynotes on Digitalisation Activities in Logistics by **Marcus Dober** and **Axel Bagszas** delved into the transformative potential of digitalisation in optimising intermodal freight transport across the Alps, focusing on terminal operations and the integration of regional logistics platforms. Dober outlined a vision for the digital future of freight terminals, emphasising the importance of reliable ETA data for train operations, improved terminal side operations through digitally optimised yard management and slot management, and the pivotal role of digital tools in managing terminal inflow to enhance efficiency and reduce environmental impact.

Bagszas' presentation complemented this by discussing the ReVeLa project, which aimed to create regional loading platforms utilising peripheral CT terminals to optimise resource allocation both economically and ecologically. This project intends to lower entry barriers for CT users, promote information exchange, and ensure a collective approach to information adoption and release through a cross-location information platform.

Both presentations underscored the critical need for digital integration and collaboration across the logistics chain to manage the complex demands of intermodal transport, from terminal operations to regional logistics networking. By leveraging digital technologies, the goal is to achieve higher throughput, greater efficiency, and sustainability in transalpine freight movements, with a particular focus on enhancing the capacity and operational efficiency of terminals and fostering the growth of combined transport through improved regional logistics platforms.

2.6. Panel Discussion | Complexity of Digitalisation

The panel discussion delved deeper into the topics initiated by the presentations, illustrating the complexity of challenges in CT.

It highlighted the significantly higher number of stakeholders in freight transport compared to passenger rail transport, making it challenging to align the system towards a clear "end customer" among shippers, forwarding agents, terminals, logistics service providers, and truckers. This complexity hinders initiatives aiming to establish a one-stop solution for rail freight. Data exchange is complicated by the lack of standardised data formats and differing interests in data transparency, while track availability remains a bottleneck for increasing CT. A fundamental reallocation of tracks or dedicated time slots could potentially create more efficient rail networks that integrate the various end points of these networks in a more demand-oriented manner.

Specifically, the complexity was discussed in the context of slot management systems. Many terminals currently lack information on the arrival times of trains and trucks. Since, unlike at seaports, goods are usually transferred directly from train to truck (vice versa), only dynamic slot systems are practical. These systems flexibly relay changing Estimated Time of Arrival (ETA) information to the collecting truckers. The growing establishment of slot systems at seaports and large warehouses, which increasingly implement slots for delivery and collection through financial or regulatory incentives, demonstrates that such initiatives are feasible.

Thus, digitalisation through platforms and other technologies is not primarily a matter of technology availability but of change management and awareness. Funding programs to disseminate information about the use of CT and digital services can help increase the acceptance and user-friendliness of rail freight transport.

Connecting these discussion outcomes with the presentations from Dirr, Lohmann, Elsinger, Scardino, Boaretti, Dober, and Bagszas, it's evident that each addresses distinct facets of these broader challenges. From the promotion of intermodal transport and digitalisation efforts to specific operational improvements like slot management and the integration of digital platforms, these initiatives collectively aim to enhance the efficiency, transparency, and sustainability of CT. They reflect a concerted effort to navigate the complexities of the intermodal transport landscape, promoting a more integrated, digitally enabled, and user-friendly future for freight transport.

3. Industry Insights | Challenges for Digitalisation in CT

3.1. Operator driven digital data exchange

Klaus-Uwe Sondermann, KombiConsult GmbH

The presentation by **Klaus-Uwe Sondermann** demonstrated the imperative and transformative potential of digitalisation in the intermodal transport sector. Sondermann introduced the KV4.0 Data Hub initiative by KombiConsult, focusing on the consolidation and real-time sharing of data across the intermodal supply chain. This approach aims to harmonise electronic interfaces, ensuring data is accessible and usable for all stakeholders, thus enhancing supply chain transparency.

The initiative involves a broad partnership including logistic service providers, intermodal operators, and railway undertakings, utilising a central electronic data hub for communication. This hub avoids the traditional platform view in favour of direct, API-based data exchange, supporting both PUSH and PULL data delivery methods. By employing a uniform XML standard and ensuring data sender control, the KV4.0 Data Hub promises significant improvements in operational efficiency and planning accuracy for intermodal transports.

Combining insights from discussions as well as presentations underlines the sector's movement towards integrated, digital solutions to streamline operations, improve environmental performance, and enhance the competitiveness of intermodal transport against road freight. This collaborative effort towards digitalisation marks a pivotal step in addressing the logistical complexities and data-sharing reluctances that have traditionally challenged the intermodal transport domain.

3.2. Rail operation optimisation by Match2Rail

Sebastian Ruckes, TX Logistics/Shift 2030

Sebastian Ruckes' presentation on shift2030 and the MATCH2RAIL platform showcased a non-profit initiative aimed at bolstering rail freight to meet the EU's 2030 climate targets. Ruckes highlighted the collaborative open network approach, involving railway undertakings, freight forwarders, CT operators, and shippers, all aimed at increasing rail freight's market share by 2030.

MATCH2RAIL was introduced as a key tool to provide visibility and opportunities for shippers and LSPs, facilitating easy identification of intermodal services for specific freight flows. By enabling shippers to upload demand and match it with existing intermodal services, and by accumulating unmatched flows into "virtual trains" to initiate new connections, the platform seeks to expand intermodal options and contribute significantly to modal shift and GHG reduction efforts.

This initiative represents a proactive step towards leveraging digitalisation to enhance the efficiency and sustainability of intermodal transport.

3.3. Forwarders' point of view

Andrea Condotta, GRUBER Logistics S.p.A.

Andrea Condotta's presentation highlighted the company's proactive measures towards creating a more sustainable logistics system. Emphasising the urgency of action today for a better future, the presentation showcased Gruber Logistics' commitment to integrating alternative fuels into their fleet, with 40% of their vehicles operating on LNG/BIOing, biodiesel, and HVO. The addition of electric vehicles marks a significant step towards reducing emissions, with an anticipation of fleet expansion.

Furthermore, the company aims to double its shipments along the Brenner route in the next three years, leveraging intermodal shipments to achieve 30% of its transport modalities and optimising cargo to avoid empty mileage.

Through IT applications for cargo and network optimisation, Gruber Logistics is dedicated to enhancing efficiency and sustainability in freight transport, embodying their core values and contributing actively to the modal shift and GHG reduction.

3.4. Push and pull for digitalisation in CT – innovative ideas from a startup

Felix Paul Czerny, CONROO GmbH

Felix Czerny's presentation introduced CONROO, a new solution designed to digitise the trucking industry, gate handling and terminal interactions.

Founded in 2021, CONROO seeks to eliminate common inefficiencies faced by truck drivers, such as unnecessary queuing and the reliance on physical trucker cards, by implementing an intuitive mobile app and web platform. This digital approach connects all stakeholders in the container terminal ecosystem, offering features like geofence-enabled navigation, AI-powered slot management, and enhanced port security compliance.

Already operational at over 30 sites since its introduction, CONROO has demonstrated significant potential in saving terminal staff hours, reducing CO2 emissions, and conserving trucker capacity. The solution is not only a step towards optimising terminal planning but also a move towards sustainable logistics, aligning with environmental goals by streamlining operations and minimising idle times.

Czerny's initiative exemplifies a pragmatic leap forward in leveraging technology to address logistics challenges, promising widespread benefits for the sector.

3.5. Panel Discussion | Challenges for Data Exchange

The afternoon presentations primarily focused on leveraging digital platforms for cooperation among various actors in CT to exchange data and optimise capacity utilisation. The discussion delved into the practical challenges arising from cross-company collaboration.

A key concern was the motivation for different stakeholders in the transport process to share data on platforms, given the risk that publishing information like train load capacities could drive down prices or be exploited by competitors, potentially even by the platform provider themselves. This necessitates a certain level of trust in platform providers. Private white-label providers, such as those offering transport tracking services, have found success, indicating a clear value proposition is necessary for all parties. Other industries, like GS1's Global Trade Item Number (GTIN) in retail, demonstrate the success of similar initiatives although the resulting additional costs are seen as very critical for the industry.

Another option discussed was applying pressure through the client – the shipper. While they typically delegate the execution of transport services to their service providers, they set the terms of the transport process through tenders, thus facilitating or hindering the use of CT. With a keen interest in sustainable transport execution, they are open to arguments for sustainability. Therefore, for CT initiatives like shift 2030, it's crucial to inform shippers (and logistics service providers) about the benefits of CT in terms of operational conditions and sustainability.

Another push factor mentioned was regulatory pressure. The example of Austria shows that mandatory checks on whether transports can be conducted by rail improve the modal split in favour of rail. However, there remains a critical view of overly strict regulation of the transport market.

Finally, the security risks of too much data transparency were highlighted. While current freight information does not disclose the contents of container shipments, the widely discussed digital freight information contain comprehensive information about the content, characteristics, loading times, and condition of cargoes, making them far more sensitive than previously shared analogue data. Given that logistics infrastructures like ports are critical infrastructures, this issue must always be considered. Nevertheless, there's also a risk that excessive security concerns could nip the trial and implementation of innovative digital solutions in the bud before their benefits can be demonstrated.

4. Conclusions and Recommendations

The outcomes of the workshop highlighted the necessity of a robust political framework to catalyse the digitalisation of CT. Attendees reached a consensus on the need for harmonisation of digital standards, which is seen as a pivotal step towards simplifying the complex web of stakeholder interactions, from freight forwarders to terminal operators. Governmental roles are to be re-evaluated; while state-driven initiatives have previously shown mixed results, there is a call for policies that support private innovation and facilitate information exchange across borders and sectors.

The example of Austria implementing mandatory checks to evaluate the viability of rail transport over road has proven to be a successful regulatory approach, encouraging a shift towards more sustainable modalities. Such policies could serve as best practice, demonstrating that strategic governmental interventions can significantly impact the industry's modal split.

To maintain momentum in CT digitalisation, it is suggested that political efforts should not only direct funding towards infrastructure but also towards fostering an environment that encourages data sharing, with adequate safeguards for security and competitive interests. This includes investment in technologies that facilitate real-time data exchange and dynamic slot management systems, both crucial for improving the flexibility and reliability of CT operations.

Moreover, policymakers are encouraged to play a facilitative role in change management within the sector, helping to alleviate resistance from traditional logistics networks. Educational programs and awareness campaigns could be instrumental in increasing the uptake of digital solutions by elucidating the operational and environmental benefits of CT.

The discussions also indicated a need for a delicate balance between regulation and innovation. While the security concerns related to increased data transparency cannot be ignored, particularly with logistics infrastructure considered critical, overly cautious regulations could hinder the development and trial of new technologies that hold the potential to revolutionise CT.

In conclusion, the workshop advocated for a multi-faceted political strategy that supports the digital transformation of CT with clear regulations, incentivises stakeholder participation, invests in future-oriented technologies, and ensures a secure yet open environment for data exchange to enhance the industry's efficiency and sustainability.