UIC Symposium

30 November – 1 December 2021
TRANSITION TO CLEAN MOBILITY
Panel 1: Digital game changers in the next 5 years?

• Moderator: Mr. Anson Jack, Emeritus Professor, University of Birmingham
• Mr. Christian Kern, Former Austrian Chancellor
• Mr. Carlo Borghini, Executive Director, Shift2Rail
• Mr. Sylvain Haon, Senior Director Strategy, UITP
• Dr. Florian Brummer, Head of EMEA in Amazon Web service (AWS) for specialty practice, supply chain, transportation and logistics
UIC Symposium

30 November – 1 December 2021

Mr. Christian Kern, Former Austrian Chancellor
Digitization – what’s next?

1. COVID accelerates the adaptation of digital technologies - demand for remote service and contactless interaction services picked up – decentralizing organization internal and customer communication

2. Rail is becoming a data-driven business model, the importance of software will increase massively compared to traditional hardware

3. The green deal is a mandate to become more productive - digitization is the key to achieving this; Authorities’ increasingly expect full service commitments

4. Industry platforms spanning value creation stages will gain in importance – requiring more cooperation between infrastructure companies, operators, oem’s

5. Digitization promotes a consolidation process on the part of technology providers – vast new challenges will lead to a shakeout process

6. Cybersecurity will become a key competence and appears besides strategy as the number one priority on the agenda of top-management
Digitization of maintenance as an efficiency lever

AVERAGE COSTS OF RAIL OPERATIONS IN GERMANY[^1] (LOCAL TRANSPORT)

- Maintenance: ~ € 1.4 per train km (10%)
- Train crew: 15%
- Energy: 35%
- Overhead: 40%

[^1]: Without vehicle procurement costs and costs for network and stations. Source: goetzpartners

Maintenance as a driver of life cycle costs in rail operations - and digitalization as a lever to improve availability and efficiency.
Snapshot: Rolling stock competitors

Alstom’s acquisition of Bombardier creates the second largest market player and reinforces ongoing consolidation dynamics.

Revenues and adj. EBITDA margin of large rail players\(^1\), 2020, in € bn.

<table>
<thead>
<tr>
<th>Company/Region</th>
<th>Revenue (bn)</th>
<th>Adj. EBITDA Margin (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alstom</td>
<td>20.2</td>
<td>9.7%</td>
</tr>
<tr>
<td>Bombardier</td>
<td>14.4</td>
<td>12%</td>
</tr>
<tr>
<td>Siemens</td>
<td>9.0</td>
<td>3.2%</td>
</tr>
<tr>
<td>STADLER</td>
<td>3.7</td>
<td>12%</td>
</tr>
<tr>
<td>CAF</td>
<td>2.9</td>
<td>9.1%</td>
</tr>
<tr>
<td>Hitachi</td>
<td>2.8</td>
<td>7.3%</td>
</tr>
<tr>
<td>Hyundai Rotem</td>
<td>1.8</td>
<td>6.0%</td>
</tr>
<tr>
<td>Kawasaki</td>
<td>1.1</td>
<td>n.a.</td>
</tr>
<tr>
<td>TALGO</td>
<td>1.0</td>
<td>n.a.</td>
</tr>
<tr>
<td>SKODA Pesa Newac</td>
<td>0.5</td>
<td>7.0%</td>
</tr>
<tr>
<td>Others</td>
<td>0.4</td>
<td>3.4%</td>
</tr>
<tr>
<td>Others</td>
<td>0.3</td>
<td>22%</td>
</tr>
<tr>
<td>Others</td>
<td>0.3</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

\(1\) Based on latest available financial data, includes rolling stock and infrastructure business, excluding non-rail segment revenues

\(2\) EBITA adj.

\(3\) Non-Adj. EBITDA margin

\(4\) Industry expert assumption

Source: goetzpartners global rail market model, expert assumptions
Rail Cyber-Attacks are Skyrocketing

On average, a cyber-attack against critical rail systems occurs every 30 days
Thank you for your attention
UIC Symposium
30 November – 1 December 2021
Mr Carlo Borghini, Executive Director, Shift2rail
Towards a climate-neutral society: the transformation of the railways

30 Nov 2021

Carlo m Borghini
Executive Director
Europe’s Rail: Vision, Objectives & Expected Impacts

**European Green Deal**
- An economy that works for people: New Industrial Strategy
- A Europe fit for the digital age: Shaping Europe’s Digital Future
- Europe in the world

**Sustainable and Smart Mobility Strategy**

**EU policy priorities**

- Integrated European transport networks
  - Urban
  - SERA
- Deliver multimodality
  - Connected and automated door to door mobility for citizens and freight users
- Delivering European rail industry competitiveness
  - Bridge the innovation “valley of death” through coordinating live, large-scale demos
- Competitive green rail freight fully integrated into logistic chain
- Accessible and Safe Mobility on Demand
- Deliver a sustainable, safe and resilient rail system
- Bring into market new and emerging land guided transport solutions

**EU policy general objectives**

**EU policy specific objectives**
A coherent framework improves the system impact of R&I activities and ensures a one European integrated system.

Large scale demonstrations accelerate opportunities for better services, operations and assets.
Governance

EU-Rail Governing Board
- European Union (EC) - ED & Founding Members
- Observers: SRG Chair, SC Chair, ERA

Executive Director
EU-Rail Programme Office

SYSTEM AND INNOVATION PROGRAMME BOARD
- Flagship projects
- Large-scale demonstrations
- Exploratory and fundamental R&I

EU-Rail Integrated Programme
- Task1 / Task2
- System Pillar Core group

SYSTEM PILLAR
- ERA SYSTEM AUTHORITY
- TSI, ISO, CEN/CENELEC

INNOVATION PILLAR

AVOIDAL BODIES
- SRG
- SC
- Deployment Group
A new Europe’s Rail

<table>
<thead>
<tr>
<th>CAPACITY INCREASE</th>
<th>OPERATION RELIABILITY</th>
<th>REDUCE EMISSIONS</th>
<th>ENERGY EFFICIENCY</th>
<th>LCC REDUCTION</th>
<th>INCREASE PUNCTUALITY</th>
</tr>
</thead>
</table>

European Rail Traffic Management
Single European Railway Area (SERA)

carlo.borghini@rail-research.europa.eu
Thank you for your attention
A different urban mobility experience
A different mobility triggered by social evolution, enabled by the digital transformation

- more home working
- more ecommerce
- change in land and space use in cities

- less urban trips?
- shorter trips?
- more leisure trips?
- greater differences between age groups?
- less opened communities?
- different use of the urban infrastructure
More seamless mobility
MOBILITY AS A LIFESTYLE: LEVERAGING THE HYPERCONNECTIVITY AND THE EVOLUTION OF THE CITY TO TRANSFORM THE MOBILITY EXPERIENCE WITH THE LIFESTYLE
Thank you for your attention

@SylvainHaon  www.uitp.org
UIC Symposium

30 November – 1 December 2021

Dr. Florian Brummer, Head of EMEA in Amazon Web service (AWS) for specialty practice, supply chain, transportation and logistics
AWS in Railway

Dr. Florian Brummer

fbrummer@amazon.com
Head of EMEA – Supply Chain, Transportation, Logistics
Railway Industry Corporate Objectives

CUSTOMER
Win (back) customers through services and interconnectivity

SUSTAINABILITY
Contribute to reduction of transport-driven carbon emissions

FRUGALITY
Operate in the most efficient way to recover from crisis
What is **Cloud computing**?

The term "**cloud computing**" refers to the on-demand delivery of IT resources via the Internet with **pay-as-you-go** pricing.
Achieving business value with cloud computing

**Cost Savings (TCO)**
Moving from Capex to Opex, paying only for what you use

**Staff Productivity**
Increase staff productivity by focusing on added value tasks

**Operational Resilience**
Benefit of improving SLAs and reducing unplanned outages

**Business Agility & Innovation**
Deploying new features/applications faster and reducing errors
Addressing Railway Industry Challenges & Opportunities

- Preventive/Predictive maintenance
- Autonomous Trains
- Data as an enabler
- Cost reduction
- Mobility as a service
- Sustainability
- Protecting and securing employees and customers
Thank You
Thank you for your attention
UIC Symposium

30 November – 1 December 2021
TRANSITION TO CLEAN MOBILITY
Panel 2: Modal shift strategy

• Moderator: Ms. Sandra Gehenot, UIC Freight Director

• Mr. Philippe Citroën, Director General, Unife

• Mr. Paul Hegge, Director Public Affairs & Corporate Social Responsibility, Lineas

• Mr. Robert Ampomah, CTO, Network Rail

• Mr. Jauri Kauppila, Head of the ITF Secretary-General's Office and Head of Quantitative Policy Analysis, International Transport Forum
UIC Symposium
30 November – 1 December 2021
Mr. Philippe Citroën, Director General, Unife
Rail is the backbone of the European sustainable mobility transition

- The European **Green Deal** (2019): A milestone of the Von der Leyen Commission to make Europe the first **climate-neutral continent by 2050**

- Decisive action to support the modal shift towards sustainable modes like rail is essential to achieve the Green Deal’s targets, as recalled in the **EC Sustainable and Smart Mobility Strategy** (2020)

- UNIFE actively working on **Fit-for-55 package** proposals that can be conducive to more sustainable rail solutions (e.g. AFIR, energy taxation)

- Rail is by far the greenest mode of mass transportation as it accounts for **less than 0.5%** of transport-related GhG emissions and improved its energy efficiency steadily

- This track record and current initiatives are a great opportunity to boost **transport decarbonization in Europe, with rail leading the transition**
EU funding for rail: A decisive role to incentivise modal shift

• **National Recovery Plans**: €55 bn to support Member States’ rail infrastructure, rolling stock, digitalisation and urban rail transport

  A few examples: Italy (€29 bn); Spain (€6.4 bn); France (€5 bn); Poland* (4.5 bn); Romania (€5 bn), Czechia (€900 million), etc.

• **Connecting Europe Facility**: €25.8 bn for transport (70% for rail) in 2021-2027 to complete the TEN-T network

• **Cohesion Policy**: Over €300* bn of funding in 2021-2027 to make Europe greener, smarter and more connected
R&I is key to speed-up modal shift

- Innovation is in the DNA of the European rail supply industry, which currently invests 3.6% of its annual turnover in R&I.

- Based on the success of Shift2Rail Joint Undertaking, Europe’s Rail Joint Undertaking will be a “game changer” for the transformation of rail transport.

- Europe’s Rail Joint Undertaking in a nutshell: Budget: 1.2bn€, 25 members (Suppliers, RUs, IMs and Research Centres), Innovation Pillar (R&I) and System Pillar (System view).

- Key areas for R&I: Digital and Automated Train Operation (ATO including FRMCS and 5G), Digital Automatic Coupling (DAC), Traffic Management System (TMS), Digital Twin, Energy Management System, New materials, Traction Systems (e.g. Hydrogen & Battery).

- R&I is of paramount importance to: 1) Increase rail market share 2) Reinforce the competitiveness of the EU rail supply industry at worldwide level 3) Attract new talents and skills!
Thank you for your attention
UIC Symposium
30 November – 1 December 2021
Mr. Paul Hegge, Director Public Affairs & Corporate Social Responsibility, Lineas
UIC Symposium

30 November – 1 December 2021

Mr. Robert Ampomah, CTO, Network Rail
Solutions to aid the Modal shift to rail

Network Rail
Modal shift – Network Rail

• More punctual and connected passenger services
• Increase capacity
• Prompt response by freight to COVID saw 7% growth in rail freight (opportunities to open new freight corridors delivered)
• Rail freight needs decarbonisation at unprecedented scale by 2040
• Electrification expansion across the rail network is key
• Govt financial incentives needed
Modal shift to freight

Delivering Shift to rail:

- Deployment of modern signalling systems (ERTMS)
- Electrification expansion
- Alternative power solutions (is hydrogen an option?)
- Better data and decision support systems to move freight from road to rail
- Automated wagon and loco coupling
- Infrastructure strengthening and better-connected freight hubs
- Further work to assess gauge, diversionary capability and capacity to grow Channel tunnel freight traffic
- Future opportunities – connection to vertiports for Autonomous Aerial Vehicles?
Thank you for your attention
UIC symposium

30 November 2021, Paris

Mr. Jauri Kauppila, Head of the ITF Secretary-General’s Office and Head of Quantitative Policy Analysis, International Transport Forum
ITF vision:
Global transport activity

**Global passenger demand, trillion pkm**

<table>
<thead>
<tr>
<th>Year</th>
<th>Recovery scenario</th>
<th>Reshape+ scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>40 pkm</td>
<td>50 pkm</td>
</tr>
<tr>
<td>2030</td>
<td>60 pkm</td>
<td>70 pkm</td>
</tr>
<tr>
<td>2050</td>
<td>90 pkm</td>
<td>100 pkm</td>
</tr>
</tbody>
</table>

**Global freight demand, trillion tkm**

<table>
<thead>
<tr>
<th>Year</th>
<th>Recovery scenario</th>
<th>Reshape+ scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>30 tkm</td>
<td>40 tkm</td>
</tr>
<tr>
<td>2030</td>
<td>50 tkm</td>
<td>60 tkm</td>
</tr>
<tr>
<td>2050</td>
<td>70 tkm</td>
<td>80 tkm</td>
</tr>
</tbody>
</table>

**Rail share (Baseline 2015 → Recovery 2050 → Reshape+ 2050)**

- **Passenger demand**: Baseline 14% → Recovery 2050 18% → Reshape+ 2050 21%
- **Passenger GHG emissions**: Baseline 4% → Recovery 2050 2% → Reshape+ 2050 1%
- **Freight demand**: Baseline 4% → Recovery 2050 5% → Reshape+ 2050 6%
- **Freight GHG emissions**: Baseline 8% → Recovery 2050 6% → Reshape+ 2050 6%

Source: ITF Transport Outlook ‘21
ITF vision: Policy measures and actions

Policy direction 1: improve and enhance infrastructure
- Enhancement of rail network density and size
- Improved physical intermodal / multimodal infrastructure
- Introduction of new ultra-high speed rail routes
- Transit-Oriented Development (TOD)

Policy direction 2: promote and incorporate technology
- Improvements in rail service frequency and capacity
- Development of Intelligent Transport Systems
- Integration of public transport ticketing systems
- Application of Mobility as a Service (Maas)

Policy direction 3: reform economic regulation
- Carbon / road pricing
- Distance-based charges for road freight
- Air ticket taxes
- Parking pricing and restrictions

Source: ITF Transport Outlook '21
Promoting modal shift: Policy directions for rail

Policy direction 1: improve and enhance infrastructure

Passenger rail

- Develop and expand urban railway system to increase capacity, safety and level of service
- Focus on high-speed rail networks to induce shift from short-distance flights and private car trips

Freight rail

- Invest in new rail links on high-throughput corridors to provide an attractive and sustainable shipping alternative
- Establish multimodal terminals and connections to facilitate seamless mode integration and accommodate growing containerization
Promoting modal shift: Policy directions for rail

Policy direction 2: promote and incorporate technology

Passenger rail

- Introduce **integrated ticketing system** to facilitate public transport transfers and increase flexibility
- Intensify the **electrification** process to improve operational cost-efficiency and viability of rail as a mode

Freight rail

- Develop **Intelligent Transport Systems** to boost performance and system capacity
- Adopt **modernization of rolling stock** to increase utilization factors, reliability and competitiveness of rail
Promoting modal shift: Policy directions for rail

Policy direction 3: reform economic regulation

Passenger + Freight Rail

- Revise **pricing** (congestion charging, parking fees) and **taxation** (vehicle registration, fuel) to impose higher costs on the adverse effects generated by other modes and to eventually promote and finance rail

- Activate **new financing instruments** (land value capture, green bonds and public-private partnerships) to support infrastructure investments, energy transition and technology adoption

- Induce **market liberalization** to encourage competition and innovation and to increase network utilization
Thank you for your attention

Dr. Young Tae KIM
YoungTae.Kim@itf-oecd.org

2 rue André Pascal
F-75775 Paris Cedex 16