Single Wagonload Traffic in Europe: challenges, prospects and policy options

Paolo Guglielminetti
PricewaterhouseCoopers

Cristiana Piccioni, Gaetano Fusco, Riccardo Licciardello, Antonio Musso
“Sapienza” University of Rome, School of Engineering
DICEA - Department of Civil Engineering, Building and Environment

Turin - September, 14th 2015
This study was aimed at:

• identifying **peculiarities of national SWL* rail markets**, in order to recognize and assess potentialities and prospects for future developments;

• defining a descriptive **picture of the SWL European network**, by contextualizing main trends, production methods, network operation and costs.

* It is not a full-train or block-train service. A synonymous expression is Less-than-Full-Train Load (LTFT) service.

The analysis focused on **11 Key Countries** - AT, BE, CZ, FR, DE, IT, PL, RO, SE, CH, UK – selected to cover a variety of SWL views and strategies implemented in Europe.

A large amount of info was gathered through a combination of desk research (analysis of previous studies and relevant literature), direct surveys and interviews with **RUs, IMs** and **stakeholder associations** (37 feedbacks).
Data collected for the selected KCs + SL and SK outline that the total SWL traffic volume was about 75 billion tonnes-km (2012) representing 27% of the total rail traffic, continuing a downward trend (while total rail traffic practically stabilized).

However, relevant differences at national level have been identified…..
The SWL Market: total traffic volume

In some countries RUs (mainly the incumbent ones) are still oriented to maintain or enhance their SWL supply;

Other countries have to face relevant economic and operational constraints related to SWL service provision;

In a 3rd group of Countries, RUs do not seem to be interested in developing SWL supply any longer.

Share of total rail freight traffic (t-km) moved by SWL services
The SWL Market: specific commodity types

As a result of the study’s questionnaire/interview findings, the main specific KCs’ traffic segments were identified:

<table>
<thead>
<tr>
<th>Most important commodities moved by SWL</th>
<th>Variation of Total Land Transport [t·km] 2008-2012</th>
<th>Variation of Rail Transport [t·km] 2008-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic metals</td>
<td>- 18%</td>
<td>- 16%</td>
</tr>
<tr>
<td>Chemical products</td>
<td>- 18%</td>
<td>+ 9%</td>
</tr>
<tr>
<td>Coal and lignite</td>
<td>+ 3%</td>
<td>+ 1%</td>
</tr>
<tr>
<td>Transport equipment</td>
<td>- 16%</td>
<td>- 18%</td>
</tr>
<tr>
<td>Agricultural products</td>
<td>+ 4,5%</td>
<td>- 5%</td>
</tr>
</tbody>
</table>

The relationship between SWL trend and overall land transport evolution seems to be true for **basic metals** and **transport equipment**. Their general trend negatively impacted on SWL sector.

For **agricultural products**, the rail volume reduction seems to be related to a modal competition, as its total land transport increased in the last 5 years.

Rail transport improved its competitiveness for **chemicals**: volumes increased in the context of a reduction in total land traffic.
Main limits and barriers to re-launching SWL

1. Reduction of demand for specific "captive" commodities

2. SWL supply downsizing or abandonment by RUs, due to budget constraints

<table>
<thead>
<tr>
<th>Most important commodities moved by SWL</th>
<th>( \Delta ) total land transport [t·km] 2008-2012</th>
<th>( \Delta ) rail transport [t·km] 2008-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic metals</td>
<td>- 18%</td>
<td>- 16%</td>
</tr>
<tr>
<td>Transport equip.</td>
<td>- 16%</td>
<td>- 18%</td>
</tr>
</tbody>
</table>

- Given the importance of international traffic (64% of SWL traffic), these strategies affect all SWL flows, even in KCs not adopting such policies.
- Better cost-effectiveness of SWL cannot be achieved in a short term (15-50% SWL services reported as not covering their production costs).
Main limits and barriers to re-launching SWL

Rightsizing of available "essential" infrastructures

- About 35% of marshalling yards reported to have been closed in 2010-2012 period;
- Density of freight stations have been also reduced.

This decision might hinder any future re-launch of SWL traffic, mainly if the tracks are removed and the available land used for other purposes (risk of "vicious circle").

Reduction of private sidings because of:

- **Lack of funding** for new infrastructure or rehabilitation; vice versa road links to industrial plants are built/maintained at no cost for the companies;
- High costs for **safety certifications** (RO, PL);
- **Lack of urban planning** requiring rail links to new industrial and/or storage areas.

Private sidings/100 km of rail network
Main limits and barriers to re-launching SWL

4

Increased competition by road sector (small/medium shipments)

- **Road transport** proved to be *price-competitive* despite increase in fuel prices;
- It is highly rated by shippers in terms of *flexibility*.

5

Low quality perceived by customers, mainly for international flows

- **Late trains** (>1 hours delay) are still 10-25% of the SWL ones;
- **Tracking & tracing** has been reported as not available on international SWL traffic.

6

Widespread use of outdated SWL production models

- **Enhanced models** (linear trains, integrated rail freight services), aiming at better use of available capacity and simplifying the transport chain, are not operated at *large scale* yet.
The SWL production models

The SWL service structure can be considered as the addition of:

**inter-marshalling-yard** train services (main transport leg)

**marshalling/shunting services**

**main leg:** marshalling at marshalling yards

**distribution:** sorting at node stations.

**Two levels of transport distribution services**

1: trains between marshalling yard and node stations (secondary leg)

2: trains for collection and delivery (local)

*The complexity of the SWL production chain implies that also the cost structure is rather complex* (traction, access, wagons, marshalling/shunting, etc.).
The search of production efficiency should be addressed to optimize use of all involved resources (wagons, shunting locomotives, marshalling yards, train capacity, etc.) through:

- simplification of the production process (e.g. reducing levels for distribution services and intermediate marshalling activities through flexibility in routing wagons);
- reduction of empty running;
- dynamic planning of train capacity utilization.
Prospects for future SWL system developments

**Large-scale development** of enhanced *production* models (efficiency and profitability-oriented), by combining typical SWL flows with intermodal or conventional traffic flows.

This implies re-designing of the network service so as to meet the demand requirements, by also reducing the gap between the *service quality provided* and that *perceived by customers*.

Economic sustainability of SWL service as part of RUs’ corporate strategy
Prospects for future SWL system developments

Setting up improved production models

The “traditional” H&S layout (high fixed costs due to marshalling operations), is gradually changing into a “hybrid” one (connected hubs and corridors and flat shunting operations)

<table>
<thead>
<tr>
<th>Adopted measures to improve SWL efficiency</th>
<th>Key Issues</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xrail Broker - Capacity Booking</td>
<td>Connected networks, ETA, high service reliability</td>
<td>Austria, Belgium, Czech Republic, Germany, Sweden, Switzerland,</td>
</tr>
<tr>
<td>Liner Train services</td>
<td>Scheduled service on corridors</td>
<td>Czech Republic, Poland</td>
</tr>
<tr>
<td>Mixed trains</td>
<td>SWL + Block train (+ Intermodal)</td>
<td>Austria, Belgium, Germany, Sweden, Italy</td>
</tr>
<tr>
<td>Multi-client trains</td>
<td>Coordinated transport plan</td>
<td>France, Italy</td>
</tr>
</tbody>
</table>

The SWL production system is progressively becoming:

- **mixed** with other services types (e.g. including batches of wagons moving ITUs to/from the terminals where they are loaded/unloaded);

- **simplified** by minimising the no° of intermediate marshalling operations and with some services operated as linear or corridor trains, having a (limited) no° of pre-defined stops where groups of wagons are cut from or assembled into the train.
Prospects for future SWL system developments

The Xrail production network

New production models focus on **efficiency improvement**, by increasing the **utilisation factor** of the available **capacity**, also by implementing **integrated capacity booking** solutions (to allow customers to properly plan and monitor their wagonload *door-to-door* supply chains).

AT, BE, CZ, DE, SE, HU, CH aims at creating an integrated network capable of improving the **SWL service quality** (reliability, punctuality, customer-orientation) and achieving **scale economies**.

- International transport schedule
- O-D specific timetable
- Estimated time of arrival
- Track & Trace
- Delay alerts

---

SIDT 2015 - Turin, September 14th

P. Guglielminetti, C. Piccioni, G. Fusco, R. Licciardello, A. Musso
Prospects for future SWL system developments

Understanding the evolution of production models is also a key point to implement policies addressed.....

to keep **essential infrastructure** in operation *(by defining guidelines and/or funding aimed at promoting their construction and rehabilitation)*;

to correctly set **track access charges** at the level that the SWL segment can sustain *(e.g. weight-dependent principle, differentiated levels by path quality/priority)*;


to simplify **safety** and **operational requirements** for secondary rail lines (freight dedicated) and **certification procedure** for private sidings;


to support “**last – mile**” operations, also by ensuring access under fair conditions to all relevant facilities;


to **harmonize** the **operating conditions** with competing **modes** *(e.g. infrastructure charging policies; industrial plants and warehouses links to the respective network)*.
Thank you for your kind attention