

Analysing single-wagon traffic in railfreight operations

More room for competition

In single-wagon traffic, attention tends to focus more often on rationalisation than on the organisational potentials of this type of transport. The consultancy firm hwh (Paul Wittenbrink, Stefan Hagenlocher, Bernhard Heizmann) was commissioned to investigate this issue by the Swiss transport ministry. Hwh carried out an analysis of cost structures, processes and possible economies of scale and scope.

Single-wagon traffic (SWT) was analysed by the consultancy firm hwh not only on with regard to cost structures but also with respect to the associated process steps as a basis for investigating process-related economies of scale and scope and identifying possible alternative forms of organisation.

Synergies between sub-processes

Proceeding on the basis of the cost structures, it is also possible to examine the degree to which synergies exist between the individual processes that make up a single-wagonload (SWL) transport system, and to determine whether these synergies are so great that the operation of an individual process or the complete system should be in the hands of a single entity.

For this purpose, possible production and transaction costs of the integrated production of different processes were analysed and evaluated. Figure 2 on page 27 shows the result in the form of a matrix, in which possible combinations between both different and identical processes are evaluated.

If the synergies between individual processes are very large (high numbers), it makes sense for the sub-processes concerned to be produced together by a single organisation. High numbers for identical processes are also indicative of marked economies of scale, which suggest that the entire production of these processes could be handled most cost-effectively by a single provider, a situation which constitutes a natural monopoly.

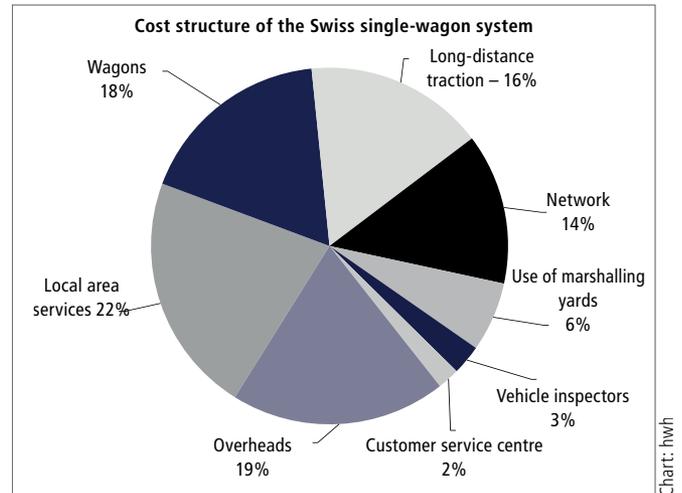
Overall, it is apparent that there are only very few processes in which the production of the whole output by a single undertaking would bring such large production or transaction cost benefits as to make integrated production indispensable. These include, for instance joint supply planning, marketing, the purchase of services and order processing. In this context joint production brings little in the way of cost benefits. However, a close

coordination between the fields of marketing and order processing is important in order, for instance, to respond quickly to fluctuations in traffic or to develop customer projects.

Here, on the whole, there are substantial coordination and transaction cost benefits, so that the various tasks could undoubtedly be performed more simply in a single organisation than in separate units. Potential synergies could also exist, for instance between order processing and the production units, or between the short and long-distance fields.

Existence of natural monopolies?

In two processes – local area services and the marshalling yard – the analysis finds that a natural monopoly exists (see figure 3). One can thus proceed on the assumption that if the work performed in marshalling yards or at a local level were



Cost breakdown of the hypothetical SWL system.

split between a number of providers, this would result in the loss of synergies. The inadequate capacity utilisation of the individual providers would result in higher production costs. It therefore makes economic sense to have only one service provider for an individual marshalling yard or local area.

However, it is also quite possible for services in various local areas or marshalling yards to be provided by a number

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	Marketing, production	Provision of wagons	Order processing	Local area services	Marshalling yard	Long-distance SWL traction
Marketing, production	P T 1 2 1	0 3 2	0 5 3	0 1 1	0 1 1	0 1 1
Provision of wagons	—	2 0 1	0 2 1	0 0 0	0 0 0	0 0 0
Order processing	—	—	2 4 3	0 2 2	0 2 2	0 2 2
Local area services	—	—	—	3 0 2	2 1 1	3 2 2
Marshalling yard	—	—	—	—	1 0 1	2 1 1
Long-distance SWL traction	—	—	—	—	—	3 2 3

An example

Production cost benefit	0	2
Transaction cost benefit	1	2

Overall benefit
1: none
5: very great

Evaluation of synergies and economies of scale in partial processes of single-wagon traffic.

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of different operators without substantial losses of synergic benefits. It is also conceivable that in local regions with particularly high traffic volumes, a number of providers can co-exist without inevitably endangering adequate capacity utilisation or adversely affecting production costs.

Organisation forms

Building upon the analysis of economies of scale and scope in the primary and secondary processes, one may now consider what forms of organisation come into consideration for single-wagon traffic. Without going into all possible variations at this point, it can be said that there are two fundamental approaches – the prime contractor model or the competition model.

The prime contractor model corresponds to the present status quo, in which railways – mostly formerly owned by the state – act as the prime contractor and integrated undertaking. Here marketing, the development of products, the capacity utilisation risk and all elements of production (often with a very high level of vertical integration) are under one roof.

It will not be possible to maintain the present form of organisation in the long term. This status quo cannot be considered sustainable, since its stability is impaired by the fact that for many years almost all existing single-wagon transport systems have been unable to operate in such a way that they are able to cover their costs. The regular moves to rationalise these systems in most cases lead to a curtailment of supply, which makes them less attractive for customers. Furthermore, the systems are constantly endangered by the splitting-off of groupable less-than-container-loads.

System provider or prime contractor

Studies carried out by hwh on the possible forms of organisation show that it is not necessary to have a single prime contractor and that it is quite possible for a number of system providers to operate in single-wagon traffic.

In this mode of organisation, which is named the competition model, the system providers develop networks whose dimensions they themselves determine,

<p>Marketing/purchase of services/tendering</p> <p>No</p> <ul style="list-style-type: none"> In addition to the state railways there are other rail forwarders who consolidate loads for carriage by the SWL system of the railways. 	<p>Supply of wagons</p> <p>No</p> <ul style="list-style-type: none"> Many wagon types can be hired from a number of providers. A monopoly situation exists – with a declining trend – almost only for mining wagons. 	<p>Order processing</p> <p>No</p> <ul style="list-style-type: none"> Order processing (traffic planning/management) is already practised today by rail forwarders.
<p>Long-distance traction</p> <p>No</p> <ul style="list-style-type: none"> Competition exists in the traction of blocktrains, but not in the traction of SWL trains between marshalling yards/junctions. However, no natural monopoly exists. However, no natural monopoly exists. 	<p>Marshalling yard</p> <p>Yes</p> <ul style="list-style-type: none"> Splitting within a marshalling yard reduces synergies (natural monopoly). Germany: marshalling yard operated by DB Schenker Rail. Switzerland: free access through SBB infrastructure. 	<p>Local area services</p> <p>Yes</p> <ul style="list-style-type: none"> As a rule, a splitting of services within a local area results in increased costs (a natural monopoly, as a rule). The biggest problem today already is resource utilisation – splitting of service results in substantial synergy losses.

Table: hwh

Examination of the processes of SWT with regard to the existence of natural monopolies.

purchase the individual operational components (traction, shunting services, local area services, etc.), bear the capacity utilisation risk and offer their network to customers – tasks that can be performed by the existing departments of the railways or by rail forwarders.

Optimum vertical integration

With regard to organisation it must also be considered whether the functions of the system provider, as is now customary, must necessarily be linked with the production of the service, that is to say whether provision and production have to be in the same hands. Here there is a danger of creating a system which is so complex that it becomes difficult to manage. Furthermore, the present high level of vertical integration leads to heavy cyclical dependence.

The necessary rationalisation measures should thus concentrate not on restricting supply but in particular on the establishment of an optimum degree of vertical integration and bringing capacity more into line with the base load than the peak load.

Access and local area services

In the variation that envisages multiple providers, it is important to assure discrimination-free access to the partial services required, in particular to marshalling yards and local area services. Here, with regard to shunting services, the Swiss model, in which the marshalling

yards are operated by the infrastructure enterprise and not by the competing railway companies, can be considered very exemplary.

The greatest barrier to entering the market is the low earnings potential. But what now prevents potential providers from making a large-scale entry into the single-wagon transport business?

Apart from the fact that there are already a number of examples in which customers contract with other providers for partial networks, the biggest barrier to market entry is now the low earnings potential in single-wagon traffic.

This may be due, for example, to the price level, the size of a network, or the inadequate exploitation of productivity potentials. In the railway industry, which tends towards structural conservatism, there is also a need for innovation in products and technology.

Opening up new prospects

Finally, the state can promote single-wagon traffic if it is not satisfied with the market result. It could, for instance, finance the infrastructure required and particularly promote local area services. This would ideally take place on a basis of competitive tendering, in which the contract is awarded to the bidder with the best price-performance ratio.

This, combined with the competitive elements described above, could open up completely new prospects for single-wagon traffic.