

SCIENTIFIC PAPERS
OF THE UNIVERSITY OF PARDUBICE
Series B
The Jan Perner Transport Faculty
12 (2006)

**POSSIBLE INTEGRATION OF LOGISTIC SYSTEMS INTO REGIONAL
SERVICE VIA ROAD CARGO TRANSPORT**

Václav CEMPÍREK, Andrea SEIDLOVÁ, Jaromír ŠIROKÝ, Petr NACHTIGALL, Rudolf KAMPF

Department of transport technology and kontrol

1. Introduction

The paper sum up partial results of continuous task handling „1F53A/126/520 Proposals of basic logistic systems applications into road cargo service of defined regions and find out their optimal utility“.

In the year 2006 was partial goal in proposal solution of logistic systems supported by railroad transport in logistic chains and rationalization of technology in transport of part-load consignment and full wagon loads. Research object by the year end 2007 have its goal in set of optimal number of formation yards and centers for manipulation with part-load consignment.

Other partial goal (System rationalization of regional and national traffic network) was focused on finding of reasons for decreasing of demand in railroad cargo transport and on other customer requirements. Here were found basic logistic aspects related to compact logistic chains. On this account was formed a questionnaire, which has been filled by app 150 companies from industry and business branch. From that questionnaire follow that road transport is cheaper, more flexible and provides more logistic services than railroad transport.

With regard to price for transport was made analysis of taxes and tolls, which are paid by users of road transport and subsequently influence of turnpike toll on competitive strength of road transport. Our results are that road transport is holding his strong position on transport marked and it will be really hard to change it.

Partial part „Proposal of new intermodal system road/railroad “resolved find out such system of service which will fully accept co-operation relationships between two economic entities focused on different mean of transport. We introduced general analysis of transport market in Switzerland in order to find out relevant answers for general service of the area by combination road/railroad transport. From the answers ensue conclusion where are summed up recommendations for economical subjects in Czech Republic.

2. Analytic part

From statistical prognosis in the analytic part is clear decreasing trend in railroad transport. While revitalization will have to be consulted experiences from West Europe, where is usual that regional tracks are modernized only for passenger transport.

In Czech Republic is important during revitalization of regional tracks, keep under operation manipulating tracks and hard surfaces for handling of road cargo carriers. If we nonperformance that rule, there can't be implemented intermodal systems like CargoDomino or Mobiler and so on.

Previous part is followed by „Proposal of new technology for area service while using intermodal transport“. That problematic will be solved in 2007, where will be find optimal number of formation yards and centers for part-load consignment processing.

3. Liberalization on transport market

From submitted text come through that liberalization of transport market will bring much higher competitive pressures between single means of transport. Also enforcement of cooperation between road and railroad transport will be very hard, how we can see from Switzerland examples. There are on one hand Swiss federal rails AG, which have year by year problems with profitability and on the other hand, there is growing competitors fight with new private railroad haulers.

Based on detailed analysis of Swiss rails, we expect that for Czech Railways will be in the future very hard realize transports of one-wagon loads and group transport of packages. Expected possible threats:

1. Cargo transport is under passenger transport from time table creation point of view,
2. Whole network tact time table work on planning of forming of trains in cargo transport, so that the demand time table is transiting to supply time table.

3. Weakness of national railroad cargo transport system is that produce of Czech industry wasn't ever oriented on general area servicing,
4. Capacity is also induced by homogeneity of each train on certain track. Nowadays is speed of fast trains, Eurocity trains or Intercity trains rather comparable with transit goods trains,
5. For general area service is for customers without direct connection on railroad advantageous system CargoDomino, which isn't intensive for technology or technical equipment for reloading of containers between road and railroad mount,
6. Positive progression of railroad transport can be supported by strict legislation, which will restrict road transport via strictly abiding with rules of traffic operations or self and social rulings,

4. Service of national and regional and his rationalization

In that part, analysis of taxes and tolls provided by users of road transport has been done. The conclusion was, that road transport pays much less for route using than railroad transport and in tied up toll accounting proposal is presented idea that the toll implementation will not decrease competitive strength of road transport. Here will be space for co-operation relationships between road and railroad haulers, which will lead to save money for toll using intermodal transport.

One part of solution is in intermodal system for operation of engaged area called Mobiler or CargoDomino (national transports) and Modalohr or CargoBeamer (international transports). All systems are described at large with advantages and disadvantages of each system. The solution is coupled with pictures in enclosure.

That part is followed by technology of area service via intermodal transport and here was found high possible saves in co-operation, because of nonpayment of toll. Intermodal systems are profitable since 600km for accompanied or unaccompanied transport.

This year was completed detailed analysis of railroad transport in Switzerland and result from it is in implementation for our conditions.

5. Technology of area service via intermodal transport

The proposal of transport system logistic applications, which uses combination of road and railroad transport, can be applied on wall-to-wall service of the area including proposal of haulage intermodal units.

Nowadays are under operation few types of verified systems with documented positive impact on modal split, economic effects and discharge of road infrastructure.

Between such systems include Mobiler, Cargo Domino, Modalohr and eventually CargoBeamer.

From picture 1 arise how can be such service realized via different type of trains. At the picture with red arrows is illustrated service of stations on regional track or eventually way stations via slow goods trains. Those trains will carry cargo to railway centers.

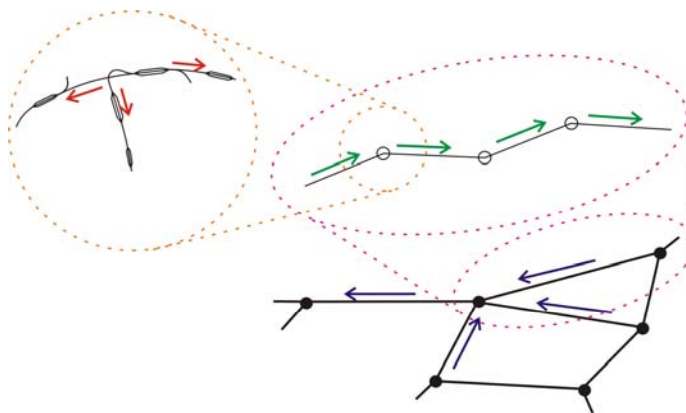
In the railway centers will be the cargo switched to continuous trains (green arrows) and the cargo will be transferred to formation yard. Here will be formed “higher quality” cargo trains according to final destination (blue arrows).

Above mentioned and in the project described intermodal systems are unpretentious for technical equipment for manipulation with intermodal units.

In all cases its horizontal reload. By the system Mobiler and Cargo Domino can be the reload realized near manipulating track on hard surface. Road cargo carrier rides longways to the manipulating track with as much as minimal distance between loading areas for smooth reload. Prerequisite is maximal vertical tolerance between loading areas ± 15 cm.

Premises for utility of the system:

1. Sufficient number of cargo wagons,
2. Availability of wagons,
3. Suitable informative and control system,
4. Electronic carriage document,
5. Service of railway station by slow goods trains twice a days,
6. Implementation of system “Night jump”,
7. Minimal demand on manpower.



Source: Authors

Picture 1 Schema of wall-to-wall area service via railroad transport

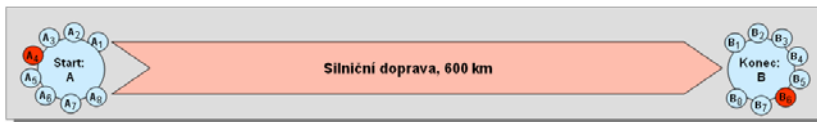
6. Economic effects arising from change of mean of transport from road to railroad

a) Direct road transport

Picture 2 represents organization of direct road transport with two possible scenarios.

In the first one, goods carrier serve at the place A customers A1 to An (consigner) and after traveling 600 and more km will serve target customers (receivers) B1 to Bn.

In the second scenario will smaller goods carrier (<12 tons) serve at the place A service of customers A1 to An (consigners) via circular journey and gives the package to logistic centre. In the logistic centre will be the packages consolidated according to directions and cargo carrier (>12 t) will transport them to logistic centre in the area B and in the area B are those packages redistributed via circular journey to target customers (receivers) B1 to Bn.



Source: Authors

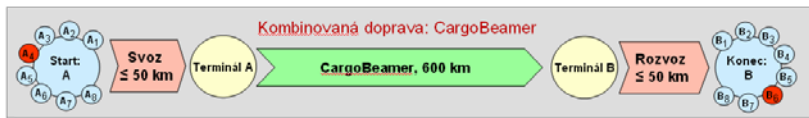
Picture 2 Direct road transport

Disadvantages of that system:

- low speed of transport,
- separation of the drive from hid family,
- toll payment,
- attrition of infrastructure, congestions, accidents and so on.

b) Combined transport road/railroad

The picture 3 shows organization of intermodal transport with haulage of packages via road transport and their transport between area A and B is supported by railroad transport. Combination of those means of transport derives benefit from both means of transport



Source: Authors

Picture 3 Combined transport road/railroad

Advantages of that system:

- relieve to the road infrastructure,
- no payment for toll,
- better labour conditions for drivers,
- lower carriage charges,
- lower production of pollutions.

If there will be seen higher cooperation between road and railroad transport there can be achieved high savings on toll. From shown schemes can be evaluated high of savings. On the forwarding distance 600 km will be the savings 4,20 Kč/km (for trucks with engines EURO III and 4 and more axles) that makes 2 520 Kč for one journey.

7. Possibilities of more extensive use of railroad transport

During solving of the problem, we made a list of investigation by app. 150 companies from industry branch and from business sector. The lists of investigation were send by e-mail back was passed 20 % of them

The list of investigation was target on usually used means of transport and on required logistic services. The results are clear: 86 % of companies use road transport and only 9 % railroad transport. The answers nearly correlate with statistic yearbook, yearly is the share of railroad transport smaller and smaller on behalf of road transport.

Nearly 73 % of companies determine questions about mean of transport and only 27% let it on forwarder. If we will achieve a change of that share, the situation will be much more positive for mass types of transport, like railroad transport.

If we will exclude clear influences leading to come over from road to railroad transport like rise in prices of fuel, toll or bottlenecks on the infrastructure with hypo-permeability (rise of congestions), than nearly 43 % of companies are unsatisfied with railroad service offer.

In the part targeted on road transport ensued from answers that only 20 % of companies realize their transport by their own vehicles. That's not surprise regarding to high number of licenses for prosecution of road transport in Czech Republic.

We asked also for additional services offered by external hauler and highest interest is in following services: compounding of packages 13 %, manipulation (loading and unloading) 19 %, distribution organization 13 % and delivery on agreed time 24 %. Other services are nearly equal with no more than 10 %.

Highest requirements are on delivery Just in Time and Just in Time Sequence, because interviewed companies are connected to supply chains for automobile and electro-technical industry.

Road transport is used for international transports in 42 % and for intrastate for 58 %. We can agree with those found out values, because intrastate transport support also transports of ovenware and raw materials.

Road cargo transport offers many advantages to their users, such as: higher speed 22 %, flexibility 16 %, door-to-door transport 14 %, price 11 %, availability 8 % and just in time supply 8 %. It's possible that if we will ask for smaller number of decisive priorities than the percentage volumes will be different (higher). The flexibility of road cargo transport is incomparable for other means of transport. Therefore will be road transport always part of logistic chains.

In the railway transport is 100 % of transports realized by external haulers. We can assume that it was in 100 % ČD, a.s.

Polled customers said, that they take interest in additional services from external hauler on the abreast logistic centers. Namely for JIT 22 %, consolidation of packages 10 %, manipulations 17 % (loading, unloading, reloading) and stocking 10 %. Other services have less than 10 %. From answers is clear that we have to support development of logistic centers with minimal two means of transport and wide spectrum of services.

Railroad transport is used mainly for transport of mass goods, but indispensable is also share of other types of products like finished products distributed via logistic centers. Railroad transport is also preferable on longer transport distance.

Railroad transport offers also other advantages like: manipulation 17 %, price 32 %, lower costs per transported ton 17 %, high-capacity wagons 17 %, transport of dangerous articles 17 %. High-capacity wagons have up to twice higher capacity than road cargo vehicles. That fact is followed by lower price for transported ton.

Statistical prognosis is showing decreasing trend in railroad cargo transport in West Europe. In West Europe are regional tracks revitalized only for passenger transport. Against it in Czech Republic, we have to keep manipulating tracks and hard surfaces at the stations on regional track for development of intermodal systems. We can't implement systems like CargoDomino, Mobiler and so on, if we don't keep above mentioned terms

8. Conclusion

The paper deals in the analytic part with problematic of toll and charges which are paid by users of road transport and the conclusion is that the charges are smaller than in railroad transport. Authors think that the toll for using of road route will not decrease competitive strength of road transport in aid of railroad transport. Here is a possibility for establish of cooperation relationships road – railroad transport.

The proposed intermodal road/railroad system gives wall-to-wall service of region via Mobiler or Cargo Domino and for international transport and proposed two systems

(Modalohr or CargoBeamer). In the conclusion is partial output focused of area service technology using intermodal transport road/railroad and authors point out that the intermodal system is profitable for minimal distance 600 km for both types of transport (accompanied or unaccompanied).

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Lektoroval: doc. Ing. Pavel Šaradin, PhD.

Předloženo: 10.3.2007

Summary

POSSIBLE INTEGRATION OF LOGISTIC SYSTEMS INTO REGIONAL SERVICE VIA ROAD CARGO TRANSPORT

Václav CEMPÍREK, Andrea SEIDLOVÁ, Jaromír ŠIROKÝ, Petr NACHTIGALL, Rudolf KAMPF

The paper deals in the analytic part with problematic of taxes and charges paid by users of road transport. Our team found out that those payments are lower than in railroad transport, so that toll system implementation can't incite movement of transports from road to railroad. Here can be set up new partnerships between road and railroad companies, which will lead to intermodal systems with savings on toll namely in domestic, but first of all in international transports. The proposal part of intermodal system deals with systems Mobiler and Cargo Domino or Modalohr and Cargo Beamer. In the conclusion are partial results focused on area service technology and savings due to cooperation of road and railroad transport. Intermodal systems are destined for minimal hauling distance 600 km in accompanied or unaccompanied transport.

Resumé

APLIKACE LOGISTICKÝCH SYSTÉMŮ DO NÁKLADNÍ OBSLUŽNÉ PŘEPRAVY

Václav CEMPÍREK, Andrea SEIDLOVÁ, Jaromír ŠIROKÝ, Petr NACHTIGALL, Rudolf KAMPF

Příspěvek se v analytické části zabývá problematikou daní a poplatků hrazených uživateli silniční dopravy, kde bylo konstatováno, že tyto platby ve srovnání s železniční dopravou jsou nižší. Především se neplatí za použití dopravní cesty a v navazujícím návrhu výpočtu mýtného v části zaměřené na snížení konkurenceschopnosti silniční dopravy zavedením mýtného bylo konstatováno, že zatím nezatíží silniční dopravu v takové míře, že by to znamenalo přesun zákazníků na železniční dopravu. Řešitelé zde poukázali na možnost vzniku kooperačních vztahů mezi železničními a silničními podniky, které by vedly k vysokým úsporám za neplacení mýtného

Václav Cempírek, Andrea Seidlová, Jaromír Široký, Petr Nachtigal, Rudolf Kampf:

při využití kombinované dopravy silnice/železnice jak ve vnitrostátní, tak především v mezinárodní dopravě.

Návrhová část systému kombinované dopravy silnice/železnice předkládá jednak řešení pro plošnou obsluhu regionů pomocí systému jako je např. Mobiler resp. Cargo Domino a pro mezinárodní nebo dálkovou vnitrostátní dopravu pomocí systému Modalohr a nebo CargoBeamer. V závěru je uveden dílčí výstup se zaměřením na technologii obsluhy území při využití kombinované dopravy silnice/železnice a je poukázáno na vysoké úspory vedoucí z kooperace mezi silniční a železniční dopravou při neplacení mýtného. Systémy kombinované dopravy pro dálkovou dopravu jsou výhodné při přepravě silničních vozidel na vzdálenost minimálně 600 km a je téměř jedno zda se jedná o doprovázenou nebo nedoprovázenou kombinovanou dopravu.

Zusammenfassung

DIE APPLIKATION DER LOGISTISCHEN SYSTEME IM GÜTERVERKEHR

Václav CEMPÍREK, Andrea SEIDLOVÁ, Jaromír ŠIROKÝ, Petr NACHTIGALL, Rudolf KAMPF

Beitrag beschreibt in ersten Teil die Problematik der Auflagen und Abgaben, die die Benutzer des Strassenverkeh gedecken. Diese Bezahlungen sind im Vergleich mit Eisenbahnverkehr niedriger. Vor allem kann man nicht zahlen zu Anwendung der Verkehrswegen. Die Lösem hier wiesen an Möglichkeit die Bildung der Kooperationsbeziehungen zwischen eisenbahn und strassen Betriebe.

Der Entwurfsteil des system kombinierte Transports Landstraße/Eisenbahn präsentiert hier einesteils Lösung für flächenhafte Bedienung der Region mit Hilfe des System wie ist z.B. Mobiler bzw . Cargo Domino und für international oder Fern Binnenverkehr mit Hilfe des System Modalohr oder CargoBeamer. Zum Schluß ist gebracht partikular Ausgang mit der Orientation an die Bedienungstechnologie des Gebiet bei der Verwendung des kombinierte Transport Landstraße/Eisenbahn und ist angeschafft an die hohe Kosteneinsparungen, die die führen aus der Kooperation zwischen Strassen und Eisenbahnverkehrs bei Nichtbezahlung der Strassenbenutzungsgebühr. Die Systemen kombinierte Transport für Ferntransport sind vorteilhafte bei Beförderung der Straßenfahrzeuge an Distanz minimal 600 km.

The presented results are part of the task VLC2005CDVUP announced by Ministry of Transport "Concept of public logistic centres in the Czech Republic in context of importance strengthening of multimodal freight transport" with the solving period 2005-2008.

