

## RESULTS OF THE PROJECT FLAVIA IN THE ACTION PLAN FOR TERMINAL DEVELOPMENT

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### 1. Introduction

The main question for this article is: How can be the capacity and attractiveness of terminals increased as interfaces between intermodal transports modes? The Action Plan as a result of project FLAVIA proposes measures for each country to increase the terminal development.

The task for each country was divided into three parts. First part takes into account the capacity of terminals and problems connected with the terminal capacity. Each country was evaluated by a national FLAVIA partner. The evaluation was focused on capacity problems such as lack of handling equipment, too short rail tracks etc. Each identified problem was described, ranked and evaluated by the responsible partner. In a first step the common evaluation of all terminals together was executed and in a next step measures have been defined in particular terminals which can increase its capacity.

The second part was focused on terminal attractiveness for customers. Five main categories were suggested at start of evaluation (Administration, Open & non-discriminatory access, Warehousing and completion of shipment, Maintenance and repair, Customer comfort). Each partner could add additional categories. The missing services in terminals have been identified for each category. The missing added value services and expected interest of customers have been evaluated, too. All problems and suggestions for solution were ranked and summarized for particular terminals.

In the last part the partners evaluated the relationship between New Liner Service (this services were also established by FLAVIA) and the current situation in the analysed terminals. In a last step the suggested measures from all countries were summarized and evaluated.

## 2. Methodology

To achieve goals of the report is necessary to follow the following steps. First an analysis of current terminals will be carried out. The categories of terminal capacity problems can be found in Table 1. In the last rows the partners should note other capacity problems. The compilation of all countries from Table 1 is showing the target for future effort to eliminate terminal capacity problems. Basic terminal data were described in different report (3.5.4 - Missing terminals). Some examples for the evaluation are given in the table below.

*Table 1: Terminal capacity problems - Template*

Type of problem [TP]	TP no.	Number of terminals concerned (in %)	Importance regarding capacity (5 very high to 1 = very low)	Relative ranking
[1]		[2]	[3]	[4]
Lack of handling equipment	1			
Too small area for storage	2	20	4	0,16
Insufficient ultimate load of the foundation	3			
Too small area for transhipment	4			
No free space for future terminal expansion	5	50	2	0,20
Insufficient capacity of road connection	6			
Insufficient capacity of railway connection	7			
Too short rail tracks	8	60	4	0,48
Insufficient capacity of inland waterway connection (if any)	9			
Opening hours too short	10			
Legal restrictions of local authorities (working times, noise, pollutions, etc.)	11	25	5	0,25
Other (please specify)	12			
Other (please specify)	13			
Other (please specify)	14			

In a second step the partners shall propose measures to eliminate the identified capacity problems. In the next table firstly the numbers of the identified problems [TP] should be inserted using the relative ranking of the problem from table 1 as a descending key. For one problem also more than one measure can be proposed. After this the expected effects, volume of investments and time horizon have to be evaluated. The last

column is reserved for the final ranking “C” (capacity) of the measures. Ranking rules can be seen below the table. The measures for terminal capacity increasing will be the result of this step. All mentioned measures have to be described and justified. The notation of the measure follows the scheme TP no.+ M + running no.

*Table 2: Measures for terminal capacity problems - Template*

TP no.	rel. Ranking	Measure	Expected effect (text in bullet points)	Investments (only evaluation)	Time horizon (only evaluation)	Final Ranking “C”
8	0,48	8M1:	• • •	• • + = large	•  ++ = medium	
		8M2:	•	•	•	
11	0,25	11M1:	•	•	•	
5	0,20	...	•	•	•	
2	0,16	...	•	•	•	
			•	•	•	

Afterwards the responsible partners should note those terminals where the measures should be applied. Entries should be sorted by “Final Ranking”, from high to low.

*Table 3: Localisation of measures to increase terminal capacity - Template*

Terminal	Measure	Final Ranking “C”	Sum “C”
Brno	8M1: name of measure		
	11M1: name of measure		
Usti n. Labem	2M1: name of measure		
	...		

In a third step the attractiveness of terminals will be evaluated. There are four groups of services that can be offered to customers in terminals. For each group the missing services have to be described. The evaluation should be done for all terminals in the country. In the column “% of terminals with missing service” estimation shall be made about the need of the services in the country. In the next columns the partners shall describe expected costs for implementing/offering of the service (low, medium, high), added value of service (why do customers request the service) expected interest of customers (low, medium, high) and ranking (“A” accessibility). The compilation of results from all countries gives the overview how to make terminals more attractive for customer and what kind of new services should be offered in terminals.

*Table 4: Missing services in terminals – Template*

Category	Missing service	% of terminal with missing service	cost for implementing / offering of service	Added value of service	Expected interest of customers	Final Ranking "A"
Administration	-					
Open & non-discriminatory access	-					
Warehousing and completion of shipment	-					
Maintenance and repair	-					
Customer comfort	-					
Other (specify)	-					

In the last step the partners shall evaluate the relationship between New Liner Service and current terminals. For each of New Liner Services suggested in other report the involved terminals will be evaluated. Also the sufficient capacity of terminals, expected contribution of new liner service and ranking ("L" Liner Services) has to be mentioned (see example in the table below).

*Table 5: New liner services - Template*

New Liner Service (from – to terminal)	Source (Report 3.5.3 or new)	Sufficient capacity in addressed terminal (Yes/No)	Expected effects regarding capacity usage and attractiveness of addressed terminal	Final Ranking "L"
Hamburg - <u>Brno</u>	new	Brno: Yes	Brno: higher utilisation of assets, reducing costs for exporting industry, hub development of Brno	4

In the last step the action leader summarizes the proposed measures to an Action List for the FLAVIA corridor. This Action List will contain an overview and ranking of the measures, which can help to increase terminal capacity and attractiveness.

### 3. Results for Czech Republic

On the territory of the Czech Republic are located 10 terminals.

#### 3.1 Terminal capacity problems

*Table 6: Terminal capacity problems – Czech Republic*

Type of problem	TP no.	Number of terminals concerned (in %)	Importance regarding capacity (5 very high to 1 = very low)	Relative ranking
[1]		[2]	[3]	[4]
Lack of handling equipment	1	50	4	0,40

Too small area for storage	2	20	4	0,16
Insufficient ultimate load of the foundation	3	20	3	0,12
Too small area for transshipment	4	30	3	0,18
No free space for future terminal expansion	5	50	2	0,20
Insufficient capacity of road connection	6	10	3	0,06
Insufficient capacity of railway connection	7	10	4	0,08
Too short rail tracks	8	60	4	0,48
Insufficient capacity of inland waterway connection (if any)	9	60	3	0,36
Opening hours too short	10	40	3	0,24
Legal restrictions of local authorities (working times, noise, pollutions, etc.)	11	25	5	0,25

Table 6 presents the analysis of current terminals in the Czech Republic. The most important capacity problems are lack of handling equipment and too short rail tracks.

*Table 7: Measures for terminal capacity problems - Czech Republic*

TP no.	rel. Ranking	Measure	Expected effect (text in bullet points)	Investments (only evaluation)	Time horizon (only evaluation)	Final Ranking "C"
8	0,48	8M1: extension of tracks	<ul style="list-style-type: none"> <li>increase capacity</li> </ul>	+++ = small	+++ = short	2,88
8	0,48	8M2: build new tracks	<ul style="list-style-type: none"> <li>increase capacity</li> <li>improvement of conditions for transshipment</li> </ul>	++ = medium	+++ = short	2,40
1	0,40	1M2: lease of handling equipment	<ul style="list-style-type: none"> <li>economical in terms of short-term use</li> </ul>	+++ = small	+++ = short	2,40
1	0,40	1M1: purchase of handling equipment	<ul style="list-style-type: none"> <li>modernization</li> <li>shorter handling</li> </ul>	++ = medium	+++ = short	2,00
10	0,24	10M2. open (Saturday and Sunday)	<ul style="list-style-type: none"> <li>better customer service</li> </ul>	+++ = small	+++ = short	1,44
10	0,24	10M1: 24 hours service	<ul style="list-style-type: none"> <li>better customer service</li> </ul>	++ = medium	+++ = short	1,20
4	0,18	4M1: reorganization of area in terminal	<ul style="list-style-type: none"> <li>extension of area for transshipment</li> </ul>	+++ = small	+++ = short	1,08
5	0,20	5M1: purchase of land	<ul style="list-style-type: none"> <li>potential for extension of terminal</li> </ul>	++ = medium	++ = medium	0,80
3	0,12	3M1: increase ultimate load of the foundation	<ul style="list-style-type: none"> <li>use of more powerful handling</li> </ul>	++ = medium	+++ = short	0,80

TP no.	rel. Ranking	Measure	Expected effect (text in bullet points)	Investments (only evaluation)	Time horizon (only evaluation)	Final Ranking "C"
			equipment			
11	0,25	11M1: more support of local authorities	• improvement of conditions for business	+ = large	++ = medium	0,75
9	0,36	9M1: building of waterway	• improvement of waterway for freight transport	+ = large	+ = long	0,72
2	0,16	2M1: extension of area for storage	• greater storage capacity	++ = medium	++ = medium	0,64
2	0,16	2M2: terminal expansion	• greater terminal capacity	+ = large	++ = medium	0,48
7	0,08	7M1: building and modernization of railway network	• better infrastructure	+ = large	+ = long	0,16
6	0,06	6M1: building of highway network	• better infrastructure	+ = large	+ = long	0,12

Table 7 presents possible measures to eliminate the identified capacity problems. Important measures are the extension of tracks or the building of new tracks; lease or purchase of handling equipment and open non-stop. Measures related with infrastructure (modernization or building railway and highway network and waterway) are very expensive but very important for intermodal transport.

*Table 8: Localisation of measures to increase terminal capacity - Czech Republic*

Terminal	Measure	Final Ranking "C"	Sum "C"
Praha Uhrineves	8M1: extension of tracks	2,88	5,28
	1M2: lease of handling equipment	2,40	
Ostrava	8M2: build new tracks	2,40	4,68
	10M1: non-stop	1,20	
	4M1: reorganization of area in terminal	1,08	
Melnik	1M1: purchase of handling equipment	2,00	3,44
	10M2. open (Saturday and Sunday)	1,44	
Decin	8M1: extension of tracks	2,88	2,88
Praha Zizkov	1M2: lease of handling equipment	2,40	2,40
Prerov	10M2. open (Saturday and Sunday)	1,44	2,24
	5M1: purchase of land	0,80	
Lovosice	1M1: purchase of handling equipment	2,00	2,00

Brno	1M1: purchase of handling equipment	2,00	2,00
Plzen	1M1: purchase of handling equipment	2,00	2,00
Usti n. Labem	10M2. open (Saturday and Sunday)	1,44	1,44

### 3.2 Attractiveness of terminals

Table 9: Missing services in terminals- Czech Republic

Category	Missing service	% of terminal with missing service	cost for implementing / offering of service	Added value of service	Expected interest of customers	Final Ranking "A"
Warehousing and completion of shipment	- short-time storage of loaded ITU (up to 5 days) - long-time storage of loaded ITU (over 5 days) - storage empty ITU	10	small	saving storage cost	high	5
Maintenance and repair	- cleaning - inspection of ITU	30	medium	outsourcing	high	5
Open & non-discriminatory access	- open non-stop	40	medium	greater flexibility	medium	4
Customer comfort	- rent of trucks - rent of containers (swap bodies) - accommodation of transport squads - banking services	50	medium	outsourcing	medium	4
Administration	- declaration service - forwarding services	30	medium	simplify the process	medium	3

Ranking by: Increased attractiveness of the terminals: 5 very high to 1 = very low.

In table 9 one can find examples of missing services in terminals. Many customers use outsourcing for various services (warehousing, maintenance and repair of ITU, etc.).

Table 10: Localisation of measures to increase terminal attractiveness - Czech Republic

Terminal	Service / VAS to be added	Final Ranking "A"	Sum "A"
Prerov	long-time storage of loaded ITU (over 5 days)	5	17
	cleaning	5	
	open non-stop	4	
	forwarding services	3	
Usti n. Labem	cleaning	5	9
	open non-stop	4	
Melnik	open non-stop	4	7
	forwarding services	3	
Decin	inspection and repair of ITU	5	5

Lovosice	inspection and repair of ITU	5	5
Ostrava	open non-stop	4	4
Brno	accommodation of transport squads and banking services	4	4
Praha Zizkov	accommodation of transport squads and banking services	4	4
Plzen	accommodation of transport squads and banking services	4	4

Each intermodal terminal should be a good provider of logistic services. Customers request various services (see Table 10).

### 3.3 Evaluation of New Liner Services

Table 11: New liner services - Czech Republic

New Liner Service (from – to terminal)	Source Report 3.5.3 or new	Sufficient capacity in addressed terminal (Yes/No)	Expected effects regarding capacity usage and attractiveness of addressed terminal	Final Ranking “L”
Hamburg - <u>Brno</u>	new	Brno: Yes	Brno: higher utilisation of assets, reducing costs for exporting industry, hub development of Brno	4
Plzen – <u>Ostrava</u>	Report 3.5.3	Ostrava: Yes	Ostrava: hub development of Ostrava	3

New Liner Services help to develop the connectivity of a region using intermodal transport.

## 4. Conclusions for all countries

### Austria

The extension of track length was evaluated as the most important measure in Austria. This measure can shorten time for train handling – no need to split the train for loading and unloading. Three terminals – Wolfurt, Salzburg and St. Pölten – were evaluated as terminals with the highest need for capacity increasing. These terminals are connected by railway in west – east direction. The terminal in Krems needs (as almost all other evaluated terminals in Austria) to extend opening hours. The private wagons are not allowed into this terminal. It is the barrier for some carriers. Three new liner services were proposed. The connection from Graz to Poland was evaluated with the highest ranking.

### Czech Republic

The most mentioned measures in Czech Republic are the track extension (or construction of new tracks in terminals) and purchase of handling equipment. Both measures can improve the terminal capacity. Terminals in Prerov, Usti nad Labem and Melnik (most evaluated terminals) need extension of opening hours. The cleaning service



is missing in almost terminals in Czech Republic. Two new lined services were proposed. There is one connection from Brno to Hamburg and the second from Plzen to Ostrava.

### **Germany**

Evaluated terminals in Germany need to find area to store not used containers outside the terminals. There is also the need of identification of new potential locations and additional transshipment facilities for Munich, Westhafen and Nurnberg area. The wagon group delivery can improve the usage of existing infrastructure. Warehousing and completion of shipment were evaluated as missing services in terminals. These new services can offer added value for customers and they are evaluated as services with high potential. Six new liner services were proposed. Three of them connect Bremen with other cities and the others start or end in Dresden.

### **Hungary**

The biggest problem of Hungarian terminals is the old handling equipment. The leasing or purchase of new handling equipment can improve the speed of operations. Other major problem seems to be the short tracks and lack of tracks in terminals. The storage of empty ITU and short and long time storage of loaded ITU was evaluated as missing service in terminals. Also the cleaning and inspection of ITU is expected as very useful service for customers. The terminals in Sopron, Szolnok and Szeged should extend the opening hours. Two new liner services were proposed in Hungary. The connection from Budapest to Szombathely can improve the transport flow in east – west direction.

### **Poland**

The missing action plan for intermodal terminals development was evaluated as the most critical point in Poland. Action plan and “terminal alliance” can improve efficiency. Also the lowest standards in terminals in comparison to terminals in Western Europe were mentioned. Increase of track length and purchase of new equipment was evaluated as minor problems. There is a limited access to 70 % of terminals in Poland. It was evaluated as very discriminatory problem. Other problem for customers can be the ability to handle only some types of ITU. Also the electronic registration and customs clearance are the most missing services in terminals. Three new liner services were proposed in Poland. Two are from Szczecin to Kraków and Sławków and one from Wrocław to Białystok.

### **Romania**

All terminals should be equipped with system for monitoring and activity management in terminals, connected at national system. It will lead to increasing of scheduling conformation for transshipment. Also the investments into new handling equipment can increase efficiency in terminals. There are no web based public

information about terminals in Romania. The potential customers have no information about offered services in terminals. Ten new liner services were proposed in Romania. The highest ranking has connection between Arad and Constanta and also connection from Bucuresti to Zalau, Arad and Constanta.

### **Slovakia**

The most crucial problem in Slovak terminals is the extension of opening hours. As the second problem the extension of rail tracks were identified. As the services with highest added value the transport and banking services and accommodation and refreshment for customers were evaluated. There were road vehicles weighing and fuelling evaluated as missing services in terminals Zilina, Kosice and Bratislava UNS. Four new liner services were proposed in Slovakia. These connections are established between west and east part of Slovakia – from Bratislava to Kosice (Presov).

### **5. FLAVIA point of view**

To the most common problems in the FLAVIA corridor belongs the insufficient track length in terminals. This kind of problem was identified in all countries and it is among TOP 3 terminal capacity problems in six from seven countries. The old handling equipment and inadequate number of handling equipment was evaluated as next common problem in terminal capacity point of view. Other problems were also identified but these problems are not common for most countries. Their occurrence is connected only with one or two countries (e.g. terminal area expansion in Austria or external container depot in region in Germany). All these kind of problems can be solved by support of national or EU initiatives e.g. financial support for new handling equipment. European commission should create conditions for customers to be motivated to use intermodal transport instead of usage of only road transport. This support should be oriented primarily on international transport.

The situation with attractiveness of terminals is different in each country. No major common problems in all countries have been identified. Only two countries declared a need of storage for loaded and empty ITU and one country declared a need of storage of hazardous goods. Also inadequate opening hours were mentioned in several cases together with limited access into terminal for some carriers.

Solutions for this kind of problems should be found on regional level and on the level of the FLAVIA Terminal Alliance, which should provide the definition of standards of services in terminals. Such type of unification can attract more customers, because the services in most terminals will have the same level (standard). The Terminal Alliance should also clearly declare the support only for intermodal terminals, which means the terminals with transshipment from road to rail and vice versa. Other types of terminals offer only logistics services (e.g. completion of goods, packaging, etc.) and they have no other kind of transport than road transport. These logistics terminals cannot contribute to decrease the share of road transport. The Terminal Alliance should have the potential

(abilities) to increase the share of rail transport in logistics chains. On the other hand this effort needs clear support from European Union and from each country.

The maps of evaluated terminals in each country are presented as annex. It is possible to conclude from these charts that Austria and Germany have very developed terminals. Their terminals reached low ranking in comparison to other countries. It follows that the main effort should be focused to countries with the worst ranking.



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## **Resumé**

### **VÝSLEDKY PROJEKTU FLAVIA - AKČNÍ PLÁN PRO ROZVOJ LOGISTICKÝCH TERMINÁLŮ**

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V průběhu projektu FLAVIA bylo zjištěno, že podpora logistiky a intermodální dopravy ve směru Německo – Černé moře, nemusí nutně znamenat několikamilionové investice v dolarech, ale může být realizováno i mnoho dílčích opatření, která budou mít synergický efekt a podpoří logistiku. Na podporu tohoto řešení vznikla výzkumná zpráva, za kterou byla Univerzita Pardubice odpovědná. Popsány jsou různé nedostatky při budování terminálů kombinované dopravy. Závěry z této výzkumné zprávy shrnuje tento příspěvek.

## **Summary**

### **RESULTS OF THE PROJECT FLAVIA IN THE ACTION PLAN FOR TERMINAL DEVELOPMENT**

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During the project FLAVIA was found that support of logistics and intermodal transport in the direction Germany - Black Sea has to be done not only by multimillion-dollar investments, but there might be done a number of sub-measures, which will have the synergic effect and support logistics. In support of this decision has been compiled this report. University of Pardubice was responsible for that report. There are described various shortcomings in the development of combined transport terminals. This article is summarizing conclusions of this report. Key words: FLAVIA, infrastructure, railroad network, inland waterway.

## **Zusammenfassung**

### **DIE ERGEBNISSE VON DEM PROJEKT FLAVIA – EIN AKTIONSPLAN FÜR DIE TERMINALENTWICKLUNG**

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Es war feststellen während der Projektdurchführung von dem FLAVIA Projekt, dass die Förderung von Logistik und Intermodalverkehr in Direktion Deutschland – Schwarze Meer Millionendollarinvestitionen bedeuten nicht musst. Viele Teilmaßnahmen kann realisieren sein und ein Synergieeffekt und Logistikforderung erreichen wird. Es war bearbeiten eine Forschungsnachricht für die Förderung von diese Idee. Die Universität Pardubice war für diese Forschungsnachricht verantwortlich. Verschiedene Mangeln bei dem Aufbau von den Kombiverkehrterminalen sind beschreibt. Die Abschlüsse von dieser Forschungsnachricht sind in diesem Beitrag zusammengefasst.