SEVENTH FRAMEWORK PROGRAMME

THEME 7

Transport including Aeronautics

Project NEAR²

NETWORK OF EUROPEAN – ASIAN RAIL RESEARCH CAPACITIES

Coordination and Support Action

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Minutes of the 1st Workshop

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No	Name	Short name	Country
1 (coordinator)	Centre of Research and Technology Hellas / Hellenic Institute of Transport	CERTH/HIT	Greece
2	EURNEX e.V.	EURNEX	Germany
3	TECHNISCHE UNIVERSITAT BERLIN	TUB	Germany
4	CESKE VYSOKE UCENI TECHNICKE V PRAZE	CVUT	Czech Republic
5	VILNIAUS GEDIMINO TECHNIKOS UNIVERSITETAS	VGTU	Lithuania
6	Moscow State University of Railway Engineering	MIIT	Russian Federation
7	A-TRANS LLC	A-TRANS	Russian Federation
8	Petersburg State Transport University	PSTU	Russian Federation
9	TONGJI UNIVERSITY	IRRT	China (People's Republic of)
10	EIRC Consulting Private Limited	EIRC	India
11	State Higher Educational Establishment Donetsk Railway Transport Institute of Ukrainian State Academy of Railway Transport	DRTI	Ukraine
12	INSTYTUT KOLEJNICTWA	IK	Poland
13	TRAINOSE METAFORES-METAFORIKES YPIRESIES EPIVATON KAI FORTIOU AE	TRAINOSE	Greece

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Abstract: D4.2 includes the Minutes of the 1st Workshop which was held in Vilnius, Lithuania on the 4th of February, 2014. The workshop aimed at the validation of the 10 Concept Documents prepared in the framework of WP3 by the invited experts.

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EXECUTIVE SUMMARY

In the framework of the NEAR² Project, 10 Concept Documents (CDs) have been created aiming to examine all the technological, tactical and strategical issues concerning the achievement of interoperability and uninterrupted transport flow along the EU-Asia railway network. The CDs were formulated by the 10 Working Groups that were formed, each one of them dealing with one specific issue and following the categorization of EURNEX in Poles.

In order to evaluate and validate these documents, several actions will be taken by the project partners, the most important of which being the organization of 3 workshops. Several experts are invited in these workshops in order to assess the Documents and provide the partners with their valuable views.

The 1st workshop was organized on the 4th of February in Vilnius, Lithuania with the participation of experts coming from the research community. The present document includes the minutes of this workshop, as well as the comments received by the experts, both during the workshop and through the completion of Document specific questionnaires.

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ABBREVIATIONS AND TERMINOLOGY

CD	Concept Document
EURNEX	European Rail Research Network of Excellence
TAR	Trans-Asian Railway
TRACECA	TRAnsport Corridor Europe-Caucasus-Asia
WG	Working Group
WP	Work Package

1. INTRODUCTION

1.1. The NEAR² project

The rapid development of Asian economies, particularly China, India and Russia has dramatically increased the trade volumes between Europe and Asia, with the largest trading partners of Europe actually being located in Asia. Nowadays, the most important trade loads are being transported between the two continents by sea.

Railway transport, using the existing and new land routes for the Trans-Eurasian land bridge presents a viable alternative to the maritime routes, which is gaining significant momentum. Due to the origins and current nature of this rail land bridge, numerous issues need to be resolved to bring the system to a modern state of infrastructure, services and operations. Furthermore, to build the capacity to fully exploit the systems potential, adaptation of new technologies, interoperability solutions and optimized operations should be considered. In order to support this objective, NEAR² proposes the creation of a Rail Research Network along the Trans-Eurasian land bridge, exploiting the structure and leveraging the achievements of the existing European Rail Research Network of Excellence (EURNEX), engaging this way all the existing research centres in a continuous and fruitful international cooperation.

One of the core activities of NEAR² is the formulation of 10 Concept Documents (CDs) that will map all the technological issues that concern the achievement of interoperability along the EU-Asia railway network. The gaps in the existing knowledge in terms of barriers and potential solutions are also being investigated, thus resulting to the identification of research needs and priorities. Each Concept Document covers a specific thematic area, based on the 10 EURNEX Poles of excellence, and is supported by a project partner, member of the NEAR² Working Group (WG). The 10 WGs of the project are the following:

1. Strategy and Economics
2. Operation and System Performance
3. Rolling Stock
4. Product Qualification Methods
5. Intelligent Mobility
6. Safety and Security
7. Environment and Energy Efficiency
8. Infrastructure and Signalling
9. Human Factors and Societal Aspects
10. Training and Education

Each one of the Working Groups identifies and analyses the relevant in each case topics of interest, while a more in depth analysis of the most prominent of them follows. The goal of this analysis is the identification of needs, barriers and research recommendations in relation to the Euro-Asian railway corridors.

Three workshops will be organized in the framework of the Project, in which a selected group of research representatives and industry parties will participate, having the goal to finalize and prioritize the initial topics of interest and the identified needs, barriers and recommendations.

1.2. Objectives of the 1st NEAR² Workshop

The 1st NEAR² workshop was organized on the 4th of February in the Amberton Hotel in Vilnius, Lithuania. As mentioned earlier, this was the 1st of 3 workshops to be organized with the goal of having the CDs evaluated and validated by the participating experts. Given that the 10 CDs include information on the Trans-Eurasian railway corridors both from the research community's perspective but also industry oriented, it was discussed and decided early in the project that representatives from both sectors should be invited to evaluate them.

In this respect, representatives from the research community were invited in the 1st workshop. In the coming workshops, industry representatives will be invited, coming from Asia in the workshop to be held in China and from Europe in the workshop to take place in Poland.

Given that the deadline for the submission of the 10 CDs to the EC was the end of November and the workshop was organized in February, its role was very critical, as it is expected to give significant input for the final, validated CDs. In some cases, as for CDs 1 and 2, which had not been submitted at the timeframe of the workshop's organization, the input was necessary for the finalization of their first draft.

1.3. Scope of the document

The scope of the present document is to report the outcomes of the 1st workshop. More specifically, the present introductory chapter includes general information on the NEAR² Project and on the objectives of the workshop.

The second chapter aims to introduce the reader to the procedures that were followed during the organization of the workshop, including the list of the invited experts, the list of the experts that actually participated, as well as the agenda followed.

The third chapter comprises the core of the document presenting the minutes of the workshop, including all the discussions that took place among the project partners and the invited experts on the CDs that were presented.

The fourth chapter reports on the information gathered and the comments made through the completion of the Document specific questionnaires that were filled out by the experts. In Chapter five conclusions are drawn on how the Documents should be updated and on the direction towards which emphasis should be give in order to promote the Trans-Eurasian railway corridor.

2. ORGANIZATION OF THE 1ST NEAR² WORKSHOP

2.1. Procedures followed towards the organization of the 1st NEAR² Workshop

2.1.1. Organizational issues

Given that the law in Lithuania requires a Public Procurement procedure to take place in order to organize an event similar to the NEAR² Workshop, a Public Procurement Committee for the organisation of the workshop was formed by the responsible partner, the Technical University of Lithuania (VGTU), and specifically by the Rector with the Order Nº1043 on the 29th of November, 2013. The Committee consisted of 3 employees of VGTU, namely:

- Mr. Gintautas Bureika,
- Mr. Gediminas Vaičiūnas and
- Ms.Lina Cerniauskiene.

The Public Tender was announced on the Lithuanian Central Procurement Information System on 18th of December, 2013, while the session for the opening of the received offers was held on the 6th of January, 2014. The winner (Procurer) of the Tender was the company "Project management institute" Ltd, which offered the lowest price for the organization of the workshop. The Procurer provided the Conference Hall at 4-star hotel "AMBERTON" in the city of Vilnius, produced promotion materials for 40 persons (notebooks, pens, clip-on cards, participant tags on the table, Agenda of Workshop, Certificates), undertook the responsibility of registering the workshop participants and delivered all coffee Brakes and lunches.

The organizer of the Gala Dinner was selected by Simplified Interviewing Procedure on the 23rd and 24th of January, 2014. The winner of this Interviewing was again the same company "Project management institute" Ltd, which offered the lowest price. The Gala Dinner was finally held in the restaurant "Narutis" on 3rd of February, 2014.

Following, the invitations for visa acquisition were sent to the project partners. Unfortunately, the Chinese partners didn't manage to obtain the visa on time due to the late reception of the invitation because of their extended national holiday period. The rest of the partners did not face any problems and attended the workshop as planned.

2.1.2. Technical issues

The ultimate goal of the workshop was to present the Concept Documents to the invited experts and to receive their views and potential input with the aim to improve them. For this reason, the agenda was organized in such a way so as to ensure the achievement of this goal.

Prior to the workshop, all the Working Group (WG) leaders were asked to prepare a brief presentation including the most important parts of each CD. All of the presentations were

sent to the coordinator (CERTH) who undertook the responsibility to review them and provide comments (if any). Given however the size of the documents and based on the fact that the invited experts would not possibly be able to fully understand the material presented in the CDs through these brief presentations, the consortium made the decision to distribute the CDs to the experts before the workshop. Each expert received only the Documents that fall under his or her expertise. In the case of the EURNEX experts, they were able to find all Documents through the project's workspace. All of the presentations are currently available through the workspace.

The next issue to be dealt with was the formulation of questionnaires for each CD. It was decided that it would be more efficient if each questionnaire was short but to the point in order to not to tire the experts and discourage them from completing it, but to ensure the acquisition of the necessary information. The questionnaires actually included two questions; the first one had to do with the list of identified topics of interest for each WG (and their prioritization) and the second one with the list of identified problems/issues/barriers (and their prioritization). The questionnaires were distributed during the workshop and before the initiation of each presentation. All of the questionnaires can be found in the Annex of the present report.

Moreover, the questionnaire will also be available online so that more experts, in addition to those who attended the 1st and will be attending subsequent workshops, will have the opportunity to complete it. The online questionnaire is also an official deliverable of the project (D4.1).

2.2. List of invited experts

The experts that were invited to the workshop came from the research community and more specifically, from two groups; the EURNEX Poles and the new members of the NEAR² Network. As regards the members of the Network, only the members coming from Europe were invited, as the Asian ones will be invited to the workshop to be organized in Shanghai, so as to minimize travel costs.

An official letter was sent to the members of the Network by the Coordinator, Dr. Boile, inviting them to the workshop and letting them know that all the costs for their trips to Vilnius will be covered by the project. The EURNEX Pole leaders on the other hand, were recruited by Prof Steinicke. Table 1 below includes the list of invited NEAR² Network Members:

Table 1: List of invited NEAR² Network Members

	Organization	Acronym	Country	Contact person
1	National Technological Platform - Interoperability of the Railway Infrastructure	SIZI	Czech Republic	Dohnal Bohuslav
2	University of Pardubice	UPa	Czech	Alexander Chlan

			Republic	
3	Brno University of Technology	BUT	Czech Republic	
4	University of Žilina	UNIZA	Czech Republic	Peter Fabian
5	Dnepropetrovsk national university of railway transport	DNURT	Ukraine	Valeriy Kuznetsov
6	Volodymyr Dahl East Ukrainian National University	VDEUNU	Ukraine	Natalia Chernetskaya - Beletskaya
7	LLC SPE RAILWAYAUTOMATIC	RWA	Ukraine	Kuznetsov Dmitry
8	State Enterprise "State Research Centre for Railway Transport of Ukraine"	SRCRTU	Ukraine	Samsonkin Valeriy
9	Ukrainian State Academy of Railway Transport	USART	Ukraine	Lomot'ko Denis
10	State educational establishment of higher professional education “Rostov State Transport University”	RSTU	Russian Federation	Noskov Vladimir Nikolaevic
11	Federal state budget-funded educational institution of higher professional education «Far Eastern State Transport University»	FESTU	Russian Federation	Suy Alexander
12	Federal state budget-funded educational institution of higher professional education “Irkutsk State University of Railway Engineering”	ISURE	Russian Federation	Kargapoltsev Sergey
13	Ural State University of Railway Transport	USURT	Russian Federation	Bushuev Sergey Valentinivich
14	Federal state budget-funded educational institution of higher professional education «Omsk State Transport University»	OSTU	Russian Federation	Shantarenko Sergey
15	State budget-funded entity of higher professional education “Siberian Transport University”	STU	Russian Federation	Bokarev Sergey

2.3. List of participating experts and partners

Table 2 and Table 3 below present the list of participating experts and participating partners respectively:

Table 2: List of participating experts

N°	Name	Organization	Country
1	Mr. Jean-Pierre Medevielle (JM)	US TRB, EURNEX	France
2	Prof. Frederic Vanderhaegen (FV)	UVHC, EURNEX	France
3	Prof. Manuel Pereira (MP)	IST, EURNEX	Portugal
4	Prof. Marek Sitarz (MS)	SUT, EURNEX	Poland
5	Prof. Manuel Pereira (MP)	IST, EURNEX	Portugal
6	Dr. Maria Aguado (MA)	UPV/EHU, EURNEX	Spain
7	Dr. Riccardo Licciardello (RL)	UNI, EURNEX	Italy
8	Prof. Valeriy Kuznetsov (VK)	DIIT	Ukraine
9	Prof. Valeri Samsonkin (VS)	DNDCUZ	Ukraine
10	Ass. Prof. Lenart Stanislav (LS)	ZAG	Slovenia
11	MSc. Herbert Seelmann (HS)	BUT	Czech Republic
12	Ass. Prof Adam Torok (AT)	BME FTEVE	Hungary
13	MSc. Miklos Banfi (MB)	BME FTEVE	Hungary
14	Dr. Stasys Dailydka (SD)	LG,	Lithuania
15	Dr. Virgilijus Jastremskas (VJ)	LG, Lithuania	Lithuania
16	MSc. Andrius Janusauskas (AJ)	LG, Lithuania	Lithuania
17	MSc. Olegal Lunys (OL)	LG, Lithuania	Lithuania

Table 3: List of participating Project partners

N°	Name	Organization	Country
1	Dr. Maria Boile (MB)	CERTH/HIT	Greece
2	Ms. Annie Kortsari (AK)	CERTH/HIT	Greece
3	Prof. Wolfgang Steinicke (WS)	EURNEX	Germany
4	MSc. Lennart Senger (LS)	EURNEX	Germany
5	Dr. Martin Schiefelbusch (MS)	TUB	Germany
6	Prof. Marcus Hecht (MH)	TUB	Germany
7	MSc. Vitek Malinovsky (VM)	CVUT	Czech Republic
8	Ass. Prof. Vilius Bartulis (VB)	VGTU	Lithuania
9	Ass. Prof. Giedrius Garbinčius (GG)	VGTU	Lithuania
10	Ass. Prof. Edgar Sokolovskij (ES)	VGTU	Lithuania
11	Prof. Gintautas Bureika (GB)	VGTU	Lithuania
12	MSc. Stasys Steisunas (SS)	VGTU	Lithuania
13	Ass. Prof. Gediminas Vaičiūnas (GV)	VGTU	Lithuania
14	MSc. Viaceslav Petrenko (VP)	VGTU	Lithuania
15	Prof. Vladimir Solowjow (VS)	MIIT	Russian Federation
16	Nikolay Putsko (NP)	MIIT	Russian Federation
17	Mr. Alexey Ivanov (AI)	A-TRANS	Russian Federation
18	Mr. Artem Voblov (AV)	A-TRANS	Russian Federation
19	Ass. Prof. Natalia Ivanova (NI)	PSTU	Russian Federation
20	Prof. Titova Tamila (TT)	PSTU	Russian Federation
21	Ms. Sourabha Rani (SR)	EIRC	India

22	Sergey Tsykhmistro (ST)	DRTI	Ukraine
23	Mykhailo Cheptsov (MC)	DRTI	Ukraine
24	MSc. Witold Olpinski (WO)	IK	Poland
25	MSc. Ismini Chatzilamprou (IC)	TRAINOSE	Greece

2.4. Workshop Agenda

The agenda of the workshop is presented below:

Time	Activity/Discussion Item	Lead Partner, Discussants
8:30	Registration – Coffee	All
9:00	Overview of the NEAR2 project • Workshop objectives • Anticipated outcomes	Coordinated by CERTH/HIT, all
9:10	WG8: Infrastructure and Signalling	Coordinated by CERTH/HIT, all
9:50	WG3: Rolling Stock	Coordinated by TUB, input and discussion all
10:30	WG9: Human Factors/Societal Aspects	Coordinated by TUB, input and discussion all
11:10	Coffee Break	-
11:30	WG10: Training and Education	Coordinated by DRTI, input and discussion all
12:10	WG4: Product Qualification Methods (PQM) and Harmonization of Standards	Coordinated by IK, input and discussion all
12:50	Lunch and networking	
14:00	WG7: Environment and Energy Efficiency	Coordinated by MIIT, input and discussion all

14:40	WG1: Strategy and Economy	Coordinated by PSTU, input and discussion all
15:20	WG6: Safety and security	Coordinated by VGTU, input and discussion all
16:00	Coffee Break	
16:30	WG5: Intelligent Mobility	Coordinated by CVUT, input and discussion all
17:10	WG2: Railway Operation and Systems Performance	Coordinated by PSTU, input and discussion all
17:50	Workshop closing	All

3. MINUTES OF THE 1ST NEAR² WORKSHOP

MB opened the 1st NEAR² Workshop by presenting its main goals and explaining the procedures to be followed. She explained that one questionnaire has been prepared for each CD and that the experts should choose which questionnaires to complete based on their expertise. After the presentation of each CD, a specific time frame has been foreseen in the agenda in order for the experts to discuss the CDs. Finally, in regards to the organizational issues, MB mentioned that all presentations will be made available through the project's workspace.

At a next step, MB welcomed the two representatives from the Lithuanian Railways, VJ, the Head of State Company "Lithuania Railways" (LG) Development Department, and AJ, the Chief Safety Inspector of LG, giving them the floor to present their company and experience.

Following, MB gave a presentation of **CD8 "Infrastructure and Signalling"** which was prepared under the leadership pf CERTH. During the presentation MB stated that the main goals of the specific CD, as well as of the project as a whole, were to identify the existing problems preventing interoperability and to link them with specific research priorities. In order to make the work of all WGs more efficient, it was decided among all WG leaders that the corridors to be examined would be decided in the framework of WG8 and would be used by the rest of the WGs. In this respect, MB demonstrated the Network Application Field, presenting existing and planned railway routes that connect Western/Central Europe to Asia. The presentation made by MB included also the identified topics of interest, the interfaces with other WGs, as well as all the research priorities related to WG8 and in combination with other WGs.

During the discussion that took place among the experts after the presentation of CD8, it was mentioned that the first step to be taken in order to promote the railways, is to identify the reasons for which the customers would choose them instead of maritime and/or air transport. Some of these reasons would be the shorter travel time (need for increase of speed and reduced delays), higher capacity and increased safety and service reliability. As regards the capacity, it was mentioned that it was one of the bottlenecks identified and that the researchers should not only examine the capacity of the line but of the key nodes as well. Ensuring the security of infrastructure should also be perceived as a priority.

The next CD that was discussed was **CD3 "Rolling Stock"** which was presented by MH, representing TUB, the leader of WG3. Prior to the presentation, MH displayed a sketch of a typical wagon used in Europe and indicated the various parts of this wagon that are different in several countries in Europe and in Asia, creating this way interoperability issues. Following, he presented the identified topics of interest to WG3, the interfaces between WG3 and other WGs, as well as the identified research priorities falling under each one of the previously mentioned topics.

Initiating the discussion, FV indicated that an interface exists between WG3 and 9 which has not been included. MP on the other hand requested further information on heavy load bogies problems in Eurasian railway connection, while he also asked about the impact of new materials' usage on the environment. MH responded that steel holds the great advantage of being durable, while aluminium on the other hand does not require repair

during a period of 20-30 years. He mentioned that the Swiss railways have tried the use of aluminium for several years and have now decided that other materials are more suitable. The choice of material is important for the railways, it is not however as important as in the case of other modes of transport, as in the case of airplanes, where it plays a very significant role.

Shunting yards is another issue causing great delays. Solving this problem could lead to much lower travel times. At this point WS pointed out that the only reason for a customer to choose the railways from other modes is to save time and hence lower the transportation cost. Right now, as MR mentioned, travel time between China and Europe is 36 days by train and 28 by ship. Specific steps should be taken therefore to decrease travel time by train so as to make the railways competitive against maritime transport. WS concluded that reliability and short travel times are very important and should be aimed at.

Apart from the above, the experts made several other comments/remarks which can be summarized as follows:

- The axle load of all wagons should be increased to 25tn so as to achieve the desired interoperability throughout the Trans-Eurasian corridors. This is both a technical and an economical issue and should be dealt with as such.
- As regards noise, the goal for all European railway companies should be to achieve the corresponding levels of China and Russia. MH provided the consortium and the rest of the experts with the necessary documentation.
- The different standards that exist for power supply should be standardized. This is very important for the case of temperature sensitive goods.
- The breaking systems that are currently used are different in Russia, Ukraine and the rest of Europe. This is a problem for which no solution has been found yet and should be thus considered as a priority towards the achievement of interoperability
- The use of low-welled cars (currently used only in the US) should be promoted.
- Bogies are another issue that causes problems.

The next CD to be discussed was **CD9 "Human Factors and Societal Aspects"** presented by MS from TUB. The participants of the specific WG followed a different approach and classified human factors into two levels: micro and macro. Micro level regards human-machine interaction and macro level regards the interaction between the rail industry and the institutions. MS described specific challenges for the Euro-Asian freight railway corridors, emphasizing on the necessity to examine the possibility to transform "EU ideas" through the Eurasian space. He mentioned that the decrease of travel time is indeed very important as mentioned earlier, it doesn't however depend only on technology, but on the people that work in the railways as well. As an example he mentioned that delays are often caused at border crossings, which are due to the lack of knowledge or skills of the people working at these positions.

During the discussion that followed, FV observed that the content of the specific WG is quite wide and the participants should decide the specific topics on which to focus. MS agreed and stated that his expectations from these workshops include receiving comments and input on

how to limit the scope of this WG. In his opinion national authorities, as well as politicians should be involved in this discussion. RL finally debated about international technical boundaries of transportation by railways.

Coming back from the coffee break, **CD10 "Training and Education"** was presented by ST from DRTI, the leader of the specific WG. The list of topics of interest was presented along with the interfaces with other WGs and the identified research priorities. ST stated that the main goal of the WG10 is to identify the current problems of the rail education system in Eurasian region and to suggest the effective solutions.

Initiating the discussion, MS mentioned that one issue that must be examined is the ageing of population in relation to the people working in the railways. More specifically, he explained that the majority of people in the railway professions are not young and have therefore received education plenty of years ago. These people should be further trained, while on the other hand, specific steps need to be taken in order to attract younger people in the railway industry. WS agreed with this statement, adding that the same problem exists both in Asia and Europe. A specific strategy should be planned in order to increase during the next ten years the attractiveness of the railways as a profession. MP added that specific master courses may be organized, as there are financial provisions for such courses under Marie Curie and other similar Programmes.

JM argued that the training should be targeted to specific types of personnel. He explained that since there are new services provided by the railways, new types of education should also be provided to students. In order to be efficient, professors should link new services with the relevant courses. This is something that is already being done in other modes such as aviation and maritime. MH mentioned that environmental education should be included in the courses mentioned as well as issues having to do with greenhouse gas emissions and noise.

FV said that, in his opinion, the low attractiveness of the railway courses has to do with the fact that students taking them will have the opportunity to find jobs only in the railway domain, unlike researchers with other diplomas that may work in other fields as well. The fact however that there is need for students and employees in the railway domain should be considered as positive, as it ensures higher possibility of actually finding a job. As regards the CD and its content, FV commented that more emphasis should be placed on the "Training" part which is not present at this point. Training has to do with people already working in the railway business and with the improvement of their skills. MB finally stated that training doesn't regard only high level people, but should be mostly focused on the workforce.

Next, WO from IK took the floor in order to present **CD4 "Product Qualification Methods and Harmonization of Standards".** The aim of the specific WG was to review product qualification procedures and analyse the possibilities of their harmonization, to identity binding law and applied standards to predict required research topics for cross-acceptance and interoperability and finally, to make recommendations on all the above issues. Given the opportunity, he asked the Russian and Chinese partners to provide him and WG4 with any strategic documents that could be used to enrich the document. Once the presentation was finalized, a discussion took place on whether a certified body would be necessary. MH mentioned that it is essential to form a corridor management team, which would include about ten people cooperating towards solving of all existing problems. The experts also stated that the development of national transport strategy and policy for all European and

Asian states is essential, along with the unification of national transport authorities to the level ensuring their possible cooperation and focusing on "greening" of the Trans-Eurasian corridors by the application of both administrative and technical measures.

Coming back from the lunch break, VS presented **CD 7 "Environment and Energy Efficiency",** listing the identified topics of interest, the research priorities in regards to WG7, as well as research recommendations in correlation with the rest of the documents. Towards the end of the presentation, VS mentioned that in all countries a strategy should be planned for the restructuring of the railways and that special attention should be placed on the sectors of international transport corridors. Finally, he stated that the comparative analysis of the two corridors confirmed what was anticipated, that electrified lines are more environmental friendly than the non-electrified ones.

During the discussion that followed, HS said that according to his opinion, several issues have not been included in the document. WS made a comment, reminding the target that has been set by the EU to increase the use of renewable energy sources to the 20% of the total energy used. This target, along with the target of decrease by 20% of energy use should pave the way for a more sustainable railway system in the future. Coming to other issues, WS placed emphasis on noise issues, that should be further examined in the document, as well as risk management and emergency management issues which should also be included. As regards the noise issues, MH repeated that noise levels must be calculated in all countries through which the railway corridors under study run and that it would be interesting to examine which kind of noise is related to which part of the infrastructure and how this can be decreased. MH, mentioning that each country calculates noise using different calculation methods, undertook the responsibility to provide WG7 participants with a document including these standards. Finally, JM added that, apart from the noise produced by vehicles, noise produced by tracks must be calculated.

The next document that was presented was **CD1 "Strategy and Economics".** NI from PSTU, leader of WG1, prior to making the presentation, explained the reasons for which CD1 has not been submitted yet. As she mentioned, the specific document proved to be very challenging and given that it examines the corridors as a whole and does not focus on a specific topic, assistance and comments are expected by all partners and experts. Following, she presented the list of identified topics of interest, as well as the identified gaps and barriers which have been categorized in physical and non-physical. Three complementary methods for the elimination of the barriers were included in the presentation.

Initiating the discussion, WS stated that in order to complete the document, the participants of WG1 as well as all the partners should have specific discussions with forwarders in order to identify the circumstances under which they would be willing to shift from maritime to railway transport. In general, strategy is the first thing to be formed in order to make the railways more competitive. According to MH, forming a strategy should include the identification of persons or infrastructure throughout the corridor that are not working properly. JM added that for shippers, the most important issue is the logistical cost. Should the railways manage to reduce this, they would become more competitive and attractive. PM argued on the necessity to prove attractiveness of the railways through deregulation and liberalisation, to create the strategy and to evaluate economics issues, to describe logistic costs.

WS and MB agreed that the issue of strategy is a horizontal issue and that strategic points have been included in all documents. These points should be identified by the corresponding leaders and then sent to NI in order for her to include them in CD1. Finally, WO proposed that all the executive summaries of all CDs should be updated so as to emphasize on and highlight that the main goal of the project is to promote the railways and contribute in making them competitive against maritime and air transport.

Next **CD6 "Safety and Security"** was presented by GB from VGTU. The list of topics of interest was provided, along with the identified barriers and the research recommendations both in regards to WG6 and in correlation to the rest of the WGs. Making a first comment, WS observed that more emphasis has been placed in the document on the issue of safety than on security. This is something that should be improved in a next version of the document. Coming to more specific comments, he mentioned that, in his opinion, the railways are an open system (contrary to air transport) and for this reason they are difficult to control. The most efficient way to ensure safety is the efficient design of infrastructure. On the other hand, education and training of the employees throughout the whole railway system is the second most important step to take in order to ensure safety. FM agreed, adding that for this reason there is a direct link between WG6 and WGs 8 and 9. Safety is very closely linked to the human factor. Apart from the people working in the railways, measures should be foreseen also for passengers. The traceability of passengers is an issue that should be examined. As in the case of the airports, procedures similar to the checking-in should be planned. Finally, MS asked whether WG6 examined technical or exploitation safety and GB answered that both aspect have been taken under consideration.

Following, the topics of interest, barriers and research recommendations included in **CD5 "Intelligent Mobility"** were presented by VM from CVUT. Once the discussion started, MA expressed the opinion that communication technologies and the services operated by them should be the focus of this CD. As she said, EURNEX is currently participating in several projects with the aim to create a unified platform which will control all these issues. Finally, she mentioned that electromagnetic compatibility is a very important issue to be examined in order to achieve reduction of travel time. WS finally said that the table presenting the interfaces between WG6 and the rest of the WGs should be updated, as there are more interfaces that must be included. Intelligent mobility is an aspect that affects every part and sector of railway transport.

The final document to be presented was **CD2 "Operation and System Performance".** Given that Prof. Siegmann who was the leader of WG2 was not able to attend the workshop, the presentation was made by NI. The presentation focused on the rules and differences in the railway operation, such as safety rules, border crossings and system performances. NI discussed the possibility of the provision of railway service between Beijing and Berlin covering the distance in 20 days. NI explained the method of the analysis and the expected results. The simulation that was made by Excel-sheet showed that the train can cover the whole distance in 15 days. Finally, NI presented conclusions of the CD2, which included the identification of high transportation costs and the need of adequate protection on container build up in order to prevent cargo damage.

RL emphasized on the necessity of attractive rail infrastructure and on the need to examine all elements of the railway (bogies changes, equipment of wide changeable wheel-sets, etc.). He mentioned that this initial work that has been done in the framework of WG2 is heading

to a good direction and that the main priorities have been identified. As a next step it is important to quantify what can be achieved by the railways now (in terms of travel time) and what may be possible in the future. In order to reduce travel time it is necessary to identify and confront all the bottlenecks that currently exist. All partners and especially RL committed in sending input and comments to the participants of WG2 in order to complete and finalize the document.

With all the Documents having been presented, the organizers thanked all the participants and especially the external to the project experts for their participation and the valuable input. GB provided Certificates of Attendance to all partners and at that point the workshop was closed.

4. SUMMARY OF WORKSHOP RESULTS

During the workshop and specifically after the presentation of each document, a questionnaire was distributed to the experts in order for them to have the opportunity to evaluate the provided information and to provide any other comments. The questionnaires were given prior to the presentations and only to the experts that stated they had an interest and/or expertise on the content of each document. The questionnaires can be found in the Annex of the present report.

The sections that follow present the comments and input received in writing by the experts.

4.1. Evaluation of CD1 "Strategy and Economics"

The topics of interest that were selected by the experts as the most important ones, along with some relevant explanations are provided below:

1. *Analysis of impact factor on freight demand*

This is actually the heart of the issue. It is important to identify the degree to which shippers of different commodities in containers are willing to pay to save substantial amounts of transit time. Quite a lot of work on this has been done, but not any dealing with time saving of the order of magnitude of this project.

In the case of the Trans-Eurasian corridor, freight demand is a key issue. It should be examined if there is a real demand for the land bridge, and if yes, to try to predict if this demand will increase in the future or if it has already reached its pick.

2. *Economic appraisal of financial results of activities within the Trans –Eurasian corridor*

This is one of the key factors to be considered while making the transport mode selection.

3. *European and Asian transport policies related to EU-Asian railway transport*

The knowledge of the political context is fundamental, because it has an influence on economic ability, both regarding demand and supply of transport. Specific policies should be applied in order to redirect freight loads from maritime to railway transport.

4. *Creation of freight demand forecast models*

One of the main issues would be the identification of partners who will be charged with the cost of investments (PPP).

5. *Impact of modern logistics on freight demand*

The demand is a base for a sustainable development of the rail industry as a whole. Future research related to this topic is necessary for the development of other sectors and fields. Understanding the demand is necessary in order to identify and propose any solutions.

6. *Study of the characteristics of freight demand along the Trans-Eurasian railway corridor*

Lack of publicly available data on transport demand, traffic flows and costs need to be dealt with in order to ensure better planning and economic prospects. Based on this, more general models and techniques can be developed.

Following, the experts were requested to identify the most important in their opinion problems/issues/barriers. The ones selected are provided below:

1. Identification of existing problems in the connection caused by the different regulating situation in Europe and Asia.
2. Formulation of an action plan for the complete deregulation of the railways in the countries of interest.
3. Identification of the most important freight railway corridors connecting Asia to Europe and identification of regulating laws applied in each one of the major countries.
4. Identification of potential problems (if any) caused by the different structures of the railway companied in EU and Asia.
5. Harmonization of the various current legislative frameworks applied at the borders of the various countries – Establishment of bilateral agreements.

The comments received by the experts on the above choices are summarized below:

- One of the key issues is the identification of difficulties in the collection of best practices in order to start the harmonization with country specific steps.
- Cooperation between rail operators is essential. They should cooperate on issues having to do with operational control, traffic management, communication, financing, safety, electronic freight documents, freight tracking, etc.
- Lack of harmonization is the main problem. The differences that exist in national standards laws and procedures hinder the development of the EU-Asian high speed rail connection.
- It is important to consider the development of the railway system not only as a technical and economic issue. It requires the collaboration of people as well, in many different ways: from train drivers and other operational staff to managers and political decision makers. This is even more true in the case of such a large and heterogeneous area like that covered by the project. The requirements of working in such different cultural and geographic settings must be well understood.
- The demand for rail transport is shaped both by the design of the rail system and the services offered by competing modes (maritime, road, air, depending on route and commodities). Furthermore, from the users' view the key matter is organising the complete shipment from origin to destination rather than just the main long-haul element. It is essential to understand the perspective of freight customers

(producers, forwarders, logistics companies) as the relevant bodies organising such logistical chains and making mode choices.

- The needs and interests of many Asian countries along the various corridors have to be understood as factors influencing any "European" activities in this region. Traffic between Central Asia and China, within the Central Asian countries or between these and the Middle East takes place on the same infrastructure as Euro-Asian services.

4.2. Evaluation of CD2 "Operations and System Performance"

At the time of the 1st workshop, CD2 had not been finalized and for this reason the lists of topics and problems/issues/barriers had not been formulated. The experts were hence requested to make an indicative choice so as to provide input for these lists.

In this respect, the topics of interest identified by the experts are the following:

- Examination of issues such as network operation, hubs, nodes and strokes or lines operation, train operation wagon operation and load operation.
- Corridor management
- Timetable planning. Implications of different operational practices on the capacity and output of the railway system.
- Harmonization of traffic/company operation management systems.
- Managing of cross borders issues.
- Managing train maintenance (including locomotives and wagons).
- Infrastructure maintenance.
- Quantification of KPIs along the envisaged routes.
- Identification of bottlenecks caused by infrastructure and suggestion of solutions (link with CD8).
- Detailed research on node capacity (yards, etc), effect of IT, document exchange, etc.

A separate comment received from an expert was that it would be necessary to identify the main key performance indicators and their availability in all the related countries. These KPIs can be for example passenger-kilometre, freight ton-kilometres, CO2 emission, net revenue, costs and incomes, pricing methodology in every segment of the whole chain. In our point of view these data are easily available in the core countries, some data can be estimated in case of the newly associated states, but data availability is questionable in some Asian countries. The minimum set of KPIs should be determined and collected for the whole chain in order to reliable assess and compare the rail transport sector in intercontinental relation.

The problems/issues/barriers that were identified are the following:

- Differences between co-working systems – technology wise and info-communication-wise.
- Allocation of train capacity.

- Economic issues. An example is who will be charged with the costs of development, maintenance and info communication.
- Problems with border crossings.

4.3. Evaluation of CD3 "Rolling Stock"

The topics of interest that were presented and considered as the most important ones by the experts are the following:

1. Braking system: Different braking systems are a very important issue, as it often causes delays.
2. Freight wagons: Dimensions and material used should be examined and modernized.
3. Train communication network and control;
4. Next generation of train control: New technologies must be used (Galileo, GNSS) in order to achieve more efficient train control.
5. Heavy load bogies: the increase in wagons' weight would cause increase in the dimensions of the bogies.
6. Gauge: An important issue is how to manage the problem of different gauges.

As a general comment it was mentioned that in general, all the issues having to do with the rolling stock should be examined in depth. New solutions require new rules (usually) and this is often a barrier. If braking constraints require additional transhipment, then this would make braking systems as the most important topic of this WG.

Following, the problems/issues/barriers that were mentioned by the experts as the most important are the following:

- Longitudinal impact of the heavy load trains: There is an immense need for harmonization of heavy load trains.
- Research train braking mode and the feasibility of the target deceleration control: Increase in the loads, often causes different braking modes.
- Research application on-board for GLONASS or BDS satellite communication system: this is crucial, as the relevant systems for road transport are already ready.
- Investigation of vehicle dynamics performance evaluation criteria: harmonization of standards is essential for Central Europe (Russia, Ukraine, and Belarus), China and India.

4.4. Evaluation of CD4 "Product Qualification Methods"

The topics of interest that were prioritized as the most important ones are provided below:

1. Cross-Acceptance – a "bridge" to interoperability;
2. Harmonization and standardization as keys to efficiency;
3. Implementation of ICT measures

Another topic that was proposed was the harmonization of the approach between national transport authorities, national market regulators, etc. Finally, another comment received was that the biggest challenge of the project will be in the territory of regulation and organisation; how can we cross-border issues be solved, for example in the case of different operation regulations (using the screw-coupler of the locomotive or the first wagon). The biggest issue is the existing organisation of the railways in the related countries. There is a question regarding how the international freight along the corridor will be organised. Will it simply be existing vertically integrated railways working together as operational control, traffic management, communication, financing, safety, electronic freight papers, freight tracking, etc.? There are also intermediate possibilities such as allowing private companies to plan and market interoperable services requiring them to pay the existing operators for contribution (for example haulage).

Following, the experts listed the most important of the identified problems/issues/barriers:

1. Consideration of all additional conditions and activities require for the initiation of the transportation in the Trans-Eurasian corridors.
2. Identification of the conditions influencing easier passing through borders of corridor states.
3. Development and establishment of unified and transparent tariff of access to the transport infrastructure.
4. Business models' development including the analysis of their pros and cons using standard SWOT analysis methods for the whole life cycle.
5. Cross-acceptance of the equipment, services and solutions including unified, homogenous certification rules.

The final comment received was that there are some barriers that cannot be overcome easily (different track gauges), but some of these problems (such as delays at border crossings) may be solved easily through harmonization of standards.

4.5. Evaluation of CD5 "Intelligent Mobility"

The topics listed by the experts as the most important for the specific WG/CD are the following:

- Service definition, human factors and cognitive skills;
- Transport telematics;
- Technology for intelligent mobility

The experts mentioned also that the working group focused on the passenger related intelligent systems, but this pole must investigate other cases too, for example the intelligent traffic operation management system, intelligent systems for shippers (train ordering, freight tracking, intelligent freight management, etc.), e-business solutions, etc.

The most important problems/issues/barriers based on the experts' opinion are the following:

- Information systems architecture for freight industry;
- Identification of which of the participating countries has the most sophisticated legislation considering EMC;
- Organization and sales of mobility solutions for cargo traffic;
- Reduction of the impact of human errors on the railway system;
- Human factors in order to improve safety management issues.

Other barriers and problems mentioned by the experts are:

- Freight dedicated corridors;
- Use and adopt available intelligent mobility systems.

Finally, it was mentioned that the three main reasons for which intelligent mobility systems must be used are to improve safety, to improve efficiency and capacity and to improve the quality of provided services.

4.6. Evaluation of CD6 "Safety and Security"

Based on the answers provided by the experts, the two most important topics of interest for the specific CD are:

- Rail safety and security systems of European and Asian countries and
- Technical aspects of railway safety in the Trans-Eurasian and bridge

Other topics of interest that were mentioned by the experts are:

- Implementation of a common safety management system for all the railway corridors;
- Security of transported goods;
- Human factors reliability;
- Management of traffic safety;
- Human reliability analysis method for safety and security.

The experts mentioned in addition that, the human factor is the most important issue when it comes to railway safety. Railways security on the other hand should be handled separately, as it is not so prominent right now in the document.

Several experts pointed out that it is necessary to identify which safety and security systems currently exist and then to analyse their technical aspects in regards to the Eurasian corridor. Safety certification and authorization have to be done in cooperation with organizations likes UIC, as well as with the industry.

Following, the problems/issues/barriers prioritized by the experts are given below:

- Evaluation of interoperability and safety in all existing and to be created Trans-Eurasian railway corridors;

- Creation of common safety methods for traffic safety risk control along the whole Trans-Eurasian corridor;
- Evaluation of safety and security stage along existing railway corridors connecting EU to Asia;
- Harmonization of the technical solutions due to the rail safety and security;
- Assurance of a common railway safety and security policy.

The experts mentioned also the following problems/issues/barriers that had not been initially included in the questionnaire:

- Resilience of the railway system facing unexpected and unpredictable events;
- Creation of a data base storing events caused by human factors;
- Identification of weak links in terms of safety and security on the railway corridors;

The experts agreed that, as a first step it is important to identify the existing problems in regards to safety and security on the Trans-Eurasian railway corridors and then to identify, propose and evaluate potential solutions.

4.7. Evaluation of CD7 "Environment and Energy Efficiency"

The topics of interest to WG7 that were identified by the experts as the most important are provided below:

- Noise and vibration on board and on the ground: the first thing to understand about noise would be the extent of its influence, meaning how many people are affected
- Energy consumption and energy efficiency of diesel and electrified traction systems: energy consumption and greenhouse gas emissions are important for the countries that have signed the Kyoto agreement. The EU being one of them has proven interest in this issue. This however does not seem to affect the railways, on the contrary it may favour them, as the train is by far the most environmental friendly mode.
- Comparison of the ecological and energy aspects of freight traffic across the Trans-Eurasian landbridge.

Other topics of interest mentioned by the experts are:

- Intelligent power supply systems;
- Reduction of dependence from fossil fuels;
- Efficient driving and operations for energy reduction

The experts mentioned also that long distance travel by train entails the running through countries with different weather conditions and possibly extreme weather conditions. This is an issue that should be examined in regards to how it could be dealt with, as it may cause serious delays.

Another issue mentioned is that the policy about ecological and energy aspects differs a lot between countries. Harmonization of the relevant standards could assist in the direction of more efficient and environmental friendly railways.

Coming to the problems/issues/barriers, the experts prioritized as the most prominent ones the following:

- Definition of technical specifications for "noise interoperability" for new rail vehicles;
- Establishment of a single legal framework for the noise and vibration emission limits (noise limits in stations and noise limits for wagons and engines crossings);
- Searching for new technologies that could reduce railway noise and vibration.

As an overall comment on noise it was noted that it is necessary to measure the current levels in all the parts of the Trans-Eurasian land bridge. Should this be done, then new technologies in order to decrease or eliminate noise may be searched for. In any case, it is absolutely necessary to create and apply standards which will have to be respected by all countries in the corridor.

4.8. Evaluation of CD8 "Infrastructure and Signalling"

Following, the experts selected the topics of interest relevant to CD8 that they considered as the most important:

- Maximum axle load;
- Rolling stock static and dynamic gauge;
- Track capacity;
- Maximum train length;
- Track gauge

It was noted that differences in the above railway elements may cause significant bottlenecks. Harmonizing them in order to achieve interoperability requires targeted and substantial investment. If these problems are not addressed early, this may affect seriously the competiveness of the railways against maritime transport.

In general, it was mentioned that well developed rail infrastructure is a prerequisite for the development of any high speed railway connection. Signalling systems on the other hand may assist in the improvement of safety and hence contribute in the achievement of high speed.

The problems/issues/barriers that were identified as the most important are the following:

- Different track gauges comprising the main barrier to interoperability: this is a major barrier; gauge changers are of high cost and difficult to implement.

- Block trains of axle-load equal or less than the minimum permitted axle-load along a connection due to incompatibility of axle loads between countries and between segments in the same country
- Reduced speed due to different rolling stock static and dynamic gauge: this is critical for commercial purposes
- Block trains of length equal or less than the minimum permitted length along a connection due to incompatibility of train lengths
- Saturated track capacity – increase in track capacity considered necessary

Other problems or barriers mentioned are the following:

- Different braking systems;
- Different coupling systems

As a final comment it was mentioned that, for such long routes as the ones considered in the project, it is essential to remove all bottlenecks. Even a small, localized bottleneck may affect the capacity of the whole corridor. Loading gauge becomes also important when it affects the size of containers and wagons.

4.9. Evaluation of CD9 "Human Factors and Societal Aspects"

The most important topics of interest in regards to WG9 based on the experts' opinion are:

- Workloads and workflows
- Interaction with 3rd-parties' personnel
- Handling of external influences (weather conditions, custom procedures, other delays, theft and other security risks)
- Human-machine interaction
- Staff working conditions
- Specific challenges arising from long distance transport

Other topics of interest mentioned by the experts are:

- Monitoring current state of the driver of the locomotive;
- Rail human reliability;
- Human factors related to safety and security;
- Decrease of automation and impact on human factors

Coming to the problems/issues/barriers, the experts prioritized as the most prominent ones the following:

- Analysis of logistics chains in Euro-Asian transport regarding their processes of establishment and operation;

- Development and testing of new work arrangements and facilities for uninterrupted long-haul operations;
- Possibilities for harmonizing man-machine interfaces in particular for driving staff, following on from the idea of the "European Drivers Desk";
- Establishment of human resources needs along the corridors considering the aging workforce, changing qualifications and depopulation of certain regions;
- Regulations on health and safety at work;
- Support measures for staff in case of difficulties

Other problems/issues/barriers mentioned by the experts were:

- Accident information storing and reporting;
- Life cycle steps of a railway system

4.10. Evaluation of CD10 "Education and Training"

The topics listed by the experts as the most important for the specific WG/CD are the following:

- Comparison of European and Asian rail education systems;
- Development of cooperation between universities and rail industry;
- Creating Eurasian University of railway (network university);
- Harmonization of standards in the development of training courses and e-courses;
- Harmonization of rail educational standards of Europe and Asia

Other topics that are of interest to the content of the specific WG based on the experts' opinion are:

- New staff profiles;
- Transformation and change of universities and services;
- Increase of the attractiveness of the railway sector for students;
- Understanding of the different degree of rail attractiveness to students;
- Application of standards for education and training for higher education institutes dealing with the railway sector

As an additional comment it was mentioned that, the existing differences in education between the two continents and/or countries are based on the existing technological and economical differences. In order to integrate and harmonize education, it is necessary to harmonize the technology and decrease the gap between the economies.

Finally, the most important problems/issues/barriers according to the experts are:

- Support initiatives to create educational web resources in the field of rail transport;
- Support academic mobility of students and researchers between the universities along the Trans-Asian land bridge
- To define a common EU qualification standard for rail staff and for trainers;

- Development of new rail educational technologies;
- Need for unification/harmonisation of rail education and training standards along Trans-European land bridge;
- Support initiatives to create educational web resources in the field of rail transport;

Finally, another problem mentioned is the lack of “Interoperability” of staff knowledge between the two continents.

5. CONCLUSIONS

The 1st NEAR² Workshop took place on the 3rd of February, 2014 in Vilnius, Lithuania. Two more workshops have been scheduled to follow in the coming months. The common goal of these three events is to present the 1O Concept Documents that have been created during the 1st year of the project to a pool of experts coming from both the research community and the industry. The participants of this first workshop were researchers, while the participants in the coming workshops will represent the industry.

All the members of the newly formulated NEAR² Rail Research Network, who come from Europe, were invited and several of them participated and provided important input and comments on the Documents. It was thus validated that the institutions that were invited to become members of the Network have proven experience and interest on the promotion of the Trans-European railway corridors.

Coming to the evaluation of the documents, specific questions were posed through the distributed questionnaires so as to guarantee the reception of adequate and specific information. The experts were asked to prioritize the identified topics of interest and the identified problems, issues and barriers, as well as to identify further ones that have not been included already. The experts explained their choices through written comments which will be exploited in the new updated documents.

As an overall comment it can be said that some documents are more mature than others. In the case of CDs 1 and 2 which have not been submitted yet, it was agreed that further work needs to be done in order to enrich them and finalize them. These documents are the most challenging ones as they deal with economic, strategic and operational issues and it was hence anticipated that they would require further effort and work from the whole consortium compared to the rest of the documents, as well as input from the industry.

All in all, valuable input and opinions were received on all the documents, which will be used in the new versions. Given that 2 more workshops will follow during which the views of the industry will be recorded, it is safe to say that the final outcome of the project, the Publication, will include all the necessary information and facts so as to comprise a useful tool for the Commission and all the relevant authorities towards the planning and promotion of the Trans-Eurasian railway network.

ANNEX - QUESTIONNAIRES

Expert's ID

Name	
Affiliation	
Email	

Working Group 1 – Strategy and Economics

1. **Please prioritize the following identified Topics of Interest for the specific WG, with "1" being the most important topic in your opinion:**

☐ Analysis of Impact factors on freight demand

☐ Study of Characteristics of freight demand along EU-Asia corridor

☐ Impact of modern logistics on freight demand

☐ Market segmentation of freight demand

☐ Creation of freight demand forecast models

☐ Appraisal of the economic impact of transportation costs

☐ Analysis of the structure of transit cargos

☐ Economic appraisal of profit redistribution possibilities between the cargo owner and the transportation company

☐ Identification of associated costs of transportation within the Trans European-Asian Corridor

☐ European and Asian transport policies related to EU-Asian railway transport

☐Economic appraisal of financial results of activities within the Trans European-Asian Corridor

☐Other……
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☐Other……
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☐Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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2. **Please prioritize the following identified Problems/Issues/Barriers/Needs for the specific WG, with "1" being the most important problem/issue/barrier/need in your opinion:**

☐ Exhaustive study on the regulating laws that apply in the two continents

☐ Identification of the most important freight railway corridors connecting Asia to Europe and identification of regulating laws applied in each one of the major crossing countries

☐ Identification of existing problems in the connection caused by the different regulating situation in the Europe and Asia

☐ Formulation of an Action Plan for the complete deregulation of the railways in the countries of interest

☐ Identification of potential problems (if any) caused by the different structures of the railway companies in EU and Asia

☐ Identification of potential solutions to overcome the barriers caused by these problems

☐ Discussions on the potential harmonization of the structure used by railway companies in the two continents

☐ Harmonization of the various current legislative frameworks applied at the borders of the various countries – Establishment of bilateral agreements

☐ Recording and evaluation of technologies/practices that are used on an international level for the improvement/tackling of border crossing problems in regards with the railways

☐ Identification of new technologies and practices for the optimization of railway related and non-railway related activities undertaken in border stations

☐ Investigation and analysis of the crossing procedures imposed at the borders of the various countries of the EU-Asian corridors at an entrepreneur and operational level

☐ Other……
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☐ Other……
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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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Expert's ID

Name	
Affiliation	
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Working Group 2 – Operations and System Performance

1. **Please prioritize the following identified Topics of Interest for the specific WG, with "1" being the most important topic in your opinion:**

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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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2. **Please prioritize the following identified Problems/Issues/Barriers for the specific WG, with "1" being the most important problem/issue/barrier in your opinion:**

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☐Other……
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☐Other……
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☐Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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Expert's ID

Name	
Affiliation	
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Working Group 3 – Rolling Stock

1. **Please prioritize the following identified Topics of Interest for the specific WG, with "1" being the most important topic in your opinion:**

☐ Heavy load bogies

☐ Vehicle dynamics

☐ Power supply

☐ Traction system

☐ Braking system

☐ Freight wagons

☐ Motive power

☐ Train communication network and control

☐ Gauge

☐ Automatic coupling

☐ Next generation of train control

☐ On-board navigation

☐ Other……
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☐ Other……
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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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2. **Please prioritize the following identified Problems/Issues/Barriers for the specific WG, with "1" being the most important problem/issue/barrier in your opinion:**

☐ Investigation of Vehicle Dynamics Performance Evaluation Criteria

☐ Longitudinal Impact of the Heavy Load Trains

☐ Materials and techniques about automatic coupling and its Cracks and fatigue life research

☐ Function requirements specification, system requirements specification and key technologies about next generation of train control;

☐ Research application on-board for GLONASS or BDS satellite communication system;

☐ Electrical power source of freight car;

☐ Research train braking mode and the feasibility of the target deceleration control analysis;

☐Other……
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☐Other……
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☐Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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Expert's ID

Name	
Affiliation	
Email	

Working Group 4 – Product Qualification Methods

1. **Please prioritize the following identified Topics of Interest for the specific WG, with "1" being the most important topic in your opinion:**

☐ Intercontinental transport policy;

☐ Increasing role of intermodal freight transport;

☐ Implementation of the ICT measures;

☐ Harmonization and Standardization as keys to efficiency

☐ Cross acceptance – a "bridge" to interoperability

☐ Other……
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☐ Other……
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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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2. Please prioritize the following identified Problems/Issues/Barriers for the specific WG, with "1" being the most important problem/issue/barrier in your opinion:

☐ Definition of particular lines and the network constituting the transcontinental transportation connections' system;

☐ Analysis of all legal conditions which have to be fulfilled for the creation of transport corridors and the suggestions of necessary harmonization of binding law;

☐ Cost estimation in order to put into operation the transport corridors' system and their particular parts;

☐ Consideration of all additional conditions and activities required for initiation of the transportation in Europe-Asia corridors;

☐ Business models' development including the analysis of their pros and cons using standard SWOT methods for the whole life cycle;

☐ Rehabilitation and modernization of existing parts of the network and corridors as well as building of some missing connections;

☐ Identification of the conditions influencing easier passing through borders of transport corridor states;

☐ Development and establishment of unified and transparent tariff of access to the transport infrastructure,

☐ Harmonization of the transport supporting telecommunication and data processing services covering the whole "door to door" transport process;

☐ Cross-acceptance of the equipment, services and solutions including unified, homogenous certification rules;

☐ Promotion system of innovative transport solutions, best practice sharing and all activities focused on transport cost reduction, improvements, greening and reduction of energy consumption;

☐Other……
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☐Other……
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☐Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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Working Group 5 – Intelligent Mobility

1. **Please prioritize the following identified Topics of Interest for the specific WG, with "1" being the most important topic in your opinion:**

☐ Technology for intelligent mobility

☐ Transport telematics

☐ System design and integration

☐ System architecture and software

☐ Service definition, human factors and cognitive skills

☐ Internal knowledge sharing and mobility and external communication and promotion

☐ Other……
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☐ Other……
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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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2. **Please prioritize the following identified Problems/Issues/Barriers/Needs for the specific WG, with "1" being the most important problem/issue/barrier/need in your opinion:**

☐ Research of technologies ensuring operating safety on the Euro-Asian railway corridors

☐ Identification of which of the participated countries has the most sophisticated legislation considering EMC

☐ Analyisis of the communication systems used in the participating countries and selection of the best one

☐ Information systems architecture for freight industry

☐ Managing the effects of train architecture and operational parameters.

☐ Architectual design issues of Euro-Asian railway network.

☐ System architecture for longer RailCab convoys

☐ Organizational and Human aspects of safety at border crossings

☐ Analysis of the Human and Social Dimensions of an incident

☐ Human Factors in order to improve safety management systems

☐ Reduction of the impact of human errors on the railway system

☐ Crowd control at stations

☐ Organisation and sales of mobility solutions for cargo traffic

☐ Dynamic Mobility Applications in Railways

☐ Persons with reduced mobility

☐ Improved punctuality for passengers through better, quicker communication between driver and signaller

☐ Problems of analogue communications systems

☐ Wi-Fi on trains

☐ Complex terrain, poor radio environment, and fast train speed are some of the problems associated with railway mobile communication

☐ Other……
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☐ Other……
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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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Working Group 6 – Safety and Security

1. **Please prioritize the following identified Topics of Interest for the specific WG, with "1" being the most important topic in your opinion:**

☐ Rail safety & security systems of European and Asian countries;

☐ Safety certification and authorization in the Europe-Asia Railways;

☐ Technical aspects of railway safety in trans-Eurasian land bridge;

☐ Other……
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☐ Other……
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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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2. Please prioritize the following identified Problems/Issues/Barriers for the specific WG, with "1" being the most important problem/issue/barrier in your opinion:

☐ Evaluation of the interoperability and safety Trans-Eurasian railway entire corridors both existing and new created

☐ Harmonisation of the technical solutions due the rail safety and security

☐ Harmonisation/ adjustment of standards/ specifications/ regulations/ rules for rail safety and security, traffic risk assessment and track installations design, dimensioning and construction

☐ Definition of certification to access the railway infrastructure of different countries;

☐ Feasibility studies on the various acceptable solutions for the rail certification procedure;

☐ Description of harmonising/ validation of rail vehicle authorisation;

☐ Investigation and implementation of Common Safety Methods for traffic safety risk control along the whole Eurasian railway connection;

☐ Identification of the main elements of the various railway safety policies systems in Europe-Asia countries and comparison in order to analyse the compatibility and harmonisation;

☐ Assurance of a common railway safety and security policy;

☐ Implementation of rolling-stock maintenance quality monitoring in entire corridors taking into account railway Traffic Safety Indexes;

☐ Creation of Common Safety Methods for traffic safety risk control along the whole Eurasian railway connection;

☐ Formation of common rail safety policy along the European-Asian land-bridge;

☐ Evaluation of safety and security stage along existing railway corridors connecting Europe and Asia;

☐ Feasibility studies on the various alternative solutions for implementation of procedures of rail infrastructure certification and vehicle authorisation;

☐ Establishment of a common way to estimate/ measure the quantitative impact of the certification on the design, constructional and operational elements of a railway infrastructure;

☐ Other……
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☐ Other……
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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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Working Group 7 – Environment and Energy Efficiency

1. **Please prioritize the following identified Topics of Interest for the specific WG, with "1" being the most important topic in your opinion:**

☐ Energy consumption and energy efficiency of diesel and electrified traction systems;

☐ Noise and vibration on board and on the ground;

☐ Influence of weather conditions on railway operation;

☐ Controlling the greenhouse gas emissions on railway transport;

☐ Comparison of ecological and energy aspects of freight traffic across the Trans-Eurasian land bridge;

☐ Energy and resource conserving technologies on railway transport;

☐ Other……
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☐ Other……
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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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2. **Please prioritize the following identified Problems/Issues/Barriers for the specific WG, with "1" being the most important problem/issue/barrier in your opinion:**

☐ Measuring of the level of noise emissions of freight trains that are routed along the Euro-Asia railway corridors;

☐ Establishment of a single legal framework for the noise and vibration emission limits (sound limits in stations and sound limits for wagons' and engines' crossing);

☐ Definition of technical specifications for "noise interoperability" for new rail vehicles;

☐ Definition of "noise technical specifications" for rail vehicles that are currently in operation;

☐ Development of a programme for the retrofitting of existing rolling stock;

☐ Searching for new technologies that could reduce railway noise and vibrations;

☐ Other……
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☐ Other……
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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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Working Group 8 – Infrastructure and Signaling

1. **Please prioritize the following identified Topics of Interest for the specific WG, with "1" being the most important topic in your opinion:**

☐ Maximum Axle Load

☐ Maximum train length

☐ Track gauge

☐ Maximum train speed

☐ Track capacity

☐ Rolling stock stating and dynamic gauge

☐ Traction system

☐ Signalling system

☐ Maintenance

☐ Other……
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☐ Other……
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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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2. **Please prioritize the following identified Problems/Issues/Barriers for the specific WG, with "1" being the most important problem/issue/barrier in your opinion:**

☐ Block trains of axle-load equal or less than the minimum permitted axle-load along a connection due to incompatibility of axle loads between countries and between segments in the same country

☐ Block trains of length equal or less than the minimum permitted length along a connection due to incompatibility of train lengths

☐ Different track gauges comprising the main barrier to interoperability

☐ Increased travel time due to different permitted speed along the various segments of a corridor

☐ Saturated track capacity – increase in track capacity considered necessary

☐ Reduced speed due to different rolling stock static and dynamic gauge

☐ Interoperability issues arising from different traction systems along a specific corridor

☐ Interoperability issues arising from different signalling systems along a specific corridor

☐ Insurance of a common track maintenance policy

☐ Other……
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☐ Other……
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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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Working Group 9 – Human Factors and Societal Aspects

1. **Please prioritize the following identified Topics of Interest for the specific WG, with "1" being the most important topic in your opinion:**

☐ Human-machine interaction

☐ Workloads and workflows

☐ Interaction with 3rd-parties' personnel

☐ Communication across borders – language barriers

☐ Handling of external influences (weather conditions, custom procedures, other delays, theft and other security risks)

☐ Staff working conditions

☐ Specific challenges arising from long distance transport

☐ Current forms of international collaboration (e.g. operations, tariffs, technical standards, policy coordination)

☐ Typology of stakeholders and allocation of roles between them

☐ Policy traditions and "styles" of interaction across borders (e.g. impact of general cross-border relations, experiences in other sectors, formal/informal expert communities)

☐ Importance of rail in national politics

☐ Societal attitudes to rail

☐ Other……
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☐ Other……
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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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2. **Please prioritize the following identified Problems/Issues/Barriers/Needs for the specific WG, with "1" being the most important problem/issue/barrier/need in your opinion:**

☐ Establishment of human resources needs along the corridors considering the aging workforce, changing qualifications and depopulation of certain regions

☐ Analysis of logistics chains in Euro-Asian transport regarding their processes of establishment and operation

☐ Development and testing of new work arrangements and facilities for uninterrupted long-haul operations

☐ Possibilities for reducing the need for location-specific knowledge and information

☐ Possibilities for harmonizing man-machine interfaces in particular for driving staff, following on from the idea of the "European Drivers Desk"

☐ Comparison of the main technical and organizational characteristics of the rail systems for which closer collaboration is envisaged

☐ Knowledge of the physical and technical working environment (routes and marshalling yards)

☐ Establishment of a common knowledge among staff, bearing in mind that the same job titles do not imply an identical understanding of tasks

☐ Support measures for staff in case of difficulties

☐ Strong institutional collaboration between companies to support staff across borders

☐ Political tension and conflicting interests between countries

☐ Review of past experiences with international collaboration along the corridors and national policy traditions

☐ Establishment of expectations towards rail transport in the countries involved, identification of common interests and possible areas of conflict

☐ Formulation of a vision (targeted level of service quality, capacity etc) for rail transport in Europe and in the region

☐ Regulations on health and safety at work

☐ Institutional arrangements dealing with cross-border mobility

☐ Fragmentation of stakeholders and heterogeneity of transport markets

☐ Other……
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☐Other……
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☐Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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Working Group 10 – Training and Education

1. **Please prioritize the following identified Topics of Interest for the specific WG, with "1" being the most important topic in your opinion:**

☐ Comparison of European and Asian rail education systems

☐ Harmonization of rail educational standards of Europe and Asia

☐ Rail e-learning (in Europe and Asia)

☐ Using web-technologies and simulators in rail education

☐ Gender aspects of rail education

☐ Rail labor market (in Europe and Asia)

☐ Rail clusters (rail educational clusters)

☐ Development of cooperation between universities and rail industry

☐ Creating Eurasian University of railway (network university)

☐ Harmonization of standards in the development of training courses and e-courses;

☐ Differences in rail competences needs in Europe and Asia

List of courses to be included in a potential Msc in railway engineering

☐ Other……
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☐ Other……
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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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2. **Please prioritize the following identified Problems/Issues/Barriers for the specific WG, with "1" being the most important problem/issue/barrier in your opinion:**

☐ Need for unification/harmonisation of rail education and training standards along Trans-European land bridge

☐ To define a common EU qualification standard for rail staff and for trainers

☐ Support initiatives to develop Dual programmes and Double degree programmes on rail education/training;

☐ Continue rail system comparisons between Europe and Asia with emphasis on development of a set of metrics along Eurasian land bridge;

☐ Develop strategies (or roadmaps) for industry on how to develop university/industry collaboration;

☐ Development of the concept of elimination of gender inequality in the system of rail education and training;

☐ Support initiatives to create educational web resources in the field of rail transport;

☐ Running a single virtual rail university to implement the tasks of distance training along Trans-Asian land bridge;

☐ Support academic mobility of students and researchers between the universities along the Trans-Asian land bridge

☐ Development of new rail educational technologies;

☐ Formulation of an action plan for the formation of rail research/educational clusters and networks for support of the development high speed railway connecting between Europe and Asia;

☐ Analysis and evaluation of the existing European and Asian rail education capacities;

☐ Formulation of the strategy (roadmap) for reforming rail labor market in the conditions of rapid development new railway corridors and high speed connection between Europe and Asia;

☐ Implementation of a high standard of rail education between Europe and Asia

☐ Other……
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☐ Other……
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☐ Other……
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Please explain briefly the importance and relevance of your top 3 choices to the EU-Asian landbridge:

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