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Item 8 of the provisional agenda

High-Speed Trains

Development of a Master Plan for high-speed trains in ECE region

Note by the secretariat

I. Mandate

1. At its last session, the Working Party on Rail Transport (SC.2) requested the secretariat to consider the issues and challenges for positioning railways in the global transport arena at its next session. Among others, the subject of high-speed trains was suggested (ECE/TRANS/SC.2/216, para. 50).

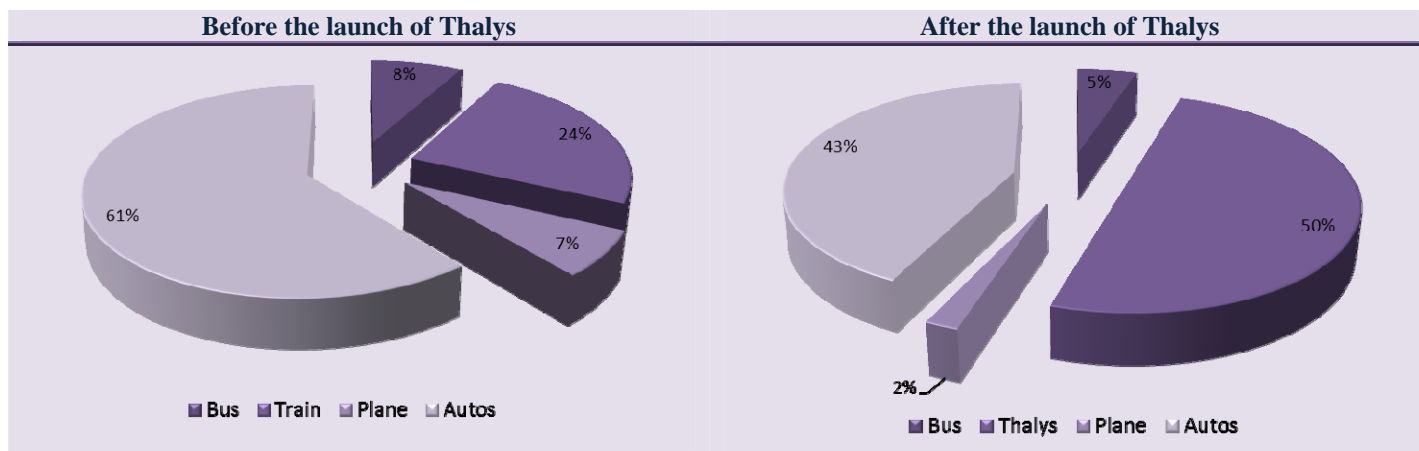
II. High-speed trains

2. The creation of high-speed networks coincides with the revitalization of rail during the past two decades. It is, in fact, an essential part of it. Wherever high-speed and very high-speed lines have been built, they have proven to be an enormous success for passenger transport. These networks have met customer demand and passenger numbers have frequently grown in double-digit percentages in those Member States that have created these lines. The first high-speed line between Paris and Lyon was primarily created to resolve capacity problems. Since then, it has become evident that time is a major competitive factor for rail. It is essentially high-speed lines that contribute to the growth of modal share for rail in passenger transport. This growth is also partially due to the

European rail supply industry that has taken over product development and is now able to provide a range of different models of very high-speed trains.¹

3. What are the benefits of high-speed trains? There is the obvious benefit to the passenger. It is now possible to travel from Paris to Brussels in 1h30, from Madrid to Barcelona in 2h38 or from Rome to Naples in 1h27. Passengers can get on and off trains in city centers. No more lengthy travel to and from airports or check in times are needed. In terms of modal shift from air to rail, the effect has been evident. On all these lines, the demand for rail transport has multiplied, resulting in a greater market share of rail. The Thalys line between Paris and Brussels is a prime example in this respect. The following figure shows that the modal share of trains after the opening of this line has doubled.

Figure 1
Modal share of trains before and after launch of high-speed rail – example Paris - Brussels

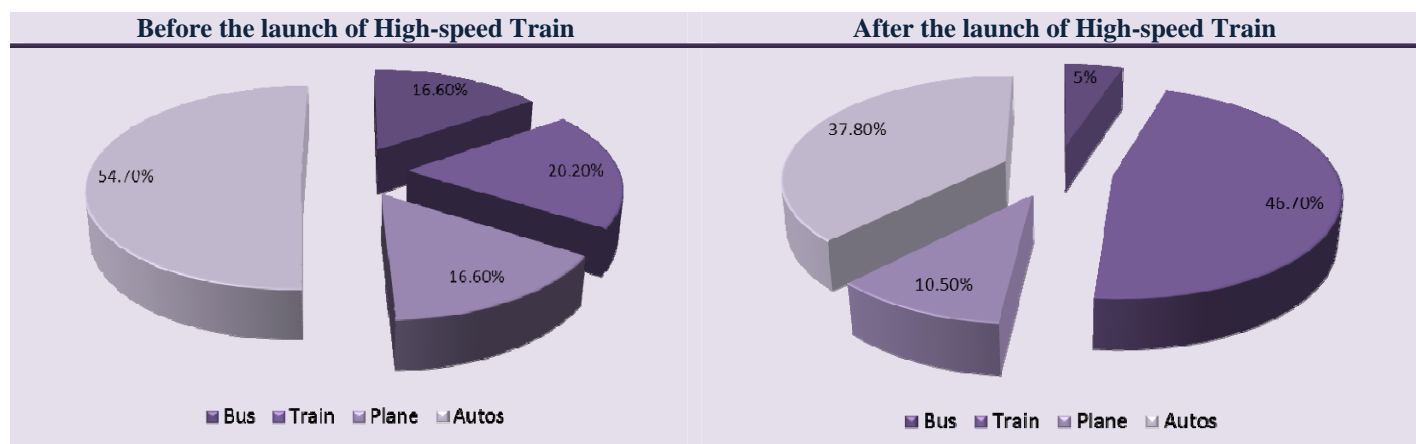


Source: UIC 2005

4. Similar results are expected for the newly opened high-speed line between Madrid and Barcelona, which was once one of the busiest air connections in the world.

¹ Michael Clausecker, Director General UNIFE, Nike Bonnen, UNIFE Public Affairs Manager, Article on “Railway Transformation” book of Roland Berger Strategy Consultants.

Figure 5
Modal share of trains before and after launch of high-speed rail – example Madrid - Barcelona



Source: ADIF 2009

5. High-speed trains appear to be the new niche market for railways, and a new source for increasing revenues.

III. Development of a Master Plan for high-speed trains in the ECE region

6. Five years ago, the United Nations Economic Commission for Europe (UNECE) published the first Trans-European North-South Motorway (TEM) and Trans-European Railway (TER) projects Master Plan, presenting a reliable and pragmatic short-, medium- and long-term investment strategy for developing road, rail and combined transport backbone networks in the participating countries. The first Master Plan proved to be an important step towards improving the transport sector performance in the study region. Many targeted investments — for example, about 45 per cent of the 491 road and rail projects contained in the Master Plan — have been completed.

7. In 2011, the TEM and TER projects completed the revision of its Master Plan. The objectives of the Master Plan revision were (a) to analyse the results of the road and rail infrastructure development in 25 participating countries of Central, Eastern and South-Eastern Europe and the Caucasus in the period covering 2005 to 2010, (b) to describe the existing status of road and rail networks, and (c) to set out the road and rail networks development programme until the year 2020.

8. The slower than expected economic growth in some participating countries unfortunately has resulted in a minimal growth of their passenger and freight transport sectors. Budgetary constraints in many of the countries have led to limited transport infrastructure development. The changes in the backbone network, traffic forecast result, as well as the above mentioned socio economic impacts have been reflected in the new Master Plan list of road and rail projects. The list is comprised of 294 motorway/road construction and/or rehabilitation and 191 rail projects, with a total cost of approximately €188 × 109. The average cost of a project (approximately €388 × 106) increased almost twofold in comparison with the average project cost in the original Master Plan. This increase was partly due to inflation, but extensively due to larger and more demanding construction projects (e.g. high-speed rail lines in some countries) which frequently focus on densely populated agglomerations.

9. Specifically for high-speed trains, the TEM and TER revised Master Plan mentions the following:

(a) There is no regional high-speed rail master plan at the Pan-European level: in practice, the vast majority of participating TER countries are planning the development and construction of high-speed railways taking into account only national needs;

(b) Some of the TER participating countries possess national high-speed rail master plans, or future plans for their construction that are at different stages of approval;

(c) At present, some TER participating countries have no plans for a national high-speed rail network;

(d) It is not always clear from country responses which speed category a particular rail section belongs. This is particularly the case with respect to the speed limit of 160 km/h: the term frequently used is “up to 160 km/h” and in some cases the respective data differ (e.g. for the same section, one source indicates a design speed of 140 km/h and another a design speed of 160 km/h);

(e) In many cases it is not clear how realistic (in particular from the point of view of secured funding) the future development plans are, especially as far as the 2020 status is concerned. For example, plans to construct in hilly terrain (where the current line allows speeds from 60 km/h to 80 km/h) hundreds of kilometres of railway links in four to five years and with a design speed of 160 km/h seem to be extremely ambitious.

10. The elaboration of a strategic plan of priority actions for the ECE region, reflecting not only trans-national concerns but also national and regional development strategies for high-speed rail transport infrastructures is necessary. These strategies should address regional and local priorities and institutional building needs, as well as the identification of alternative scenarios of strategies’ implementation, including the establishment of a list of priority projects for financing and the costs involved.

11. In this way a consistent investment strategy for the high-speed rail transport infrastructure needs in UNECE member States would lead to a complete backbone network. On this basis, countries concerned would be able to focus on monitoring the implementation of this network, as well as, adopting other developments and economic conditions that will appear during the subsequent years.

12. In order to achieve these objectives a strategic Master Plan of the high-speed railway transport infrastructure needs in the ECE region could be developed as part of a specific project to be undertaken under the auspices of UNECE.

13. The objectives of such a Master Plan are the following:

(a) Harmonization of technical parameters regarding the terminology “high-speed trains”;

(b) Identification of investment priorities;

(c) Establishment of a time table for their realization;

(d) Assessment of cost involved and appropriate financing arrangements;

(e) Development of an integrated high-speed rail transport backbone network for the ECE region.

14. The tasks that should be elaborated as part of the Master Plan are the following:

(a) Review of related work (TEM Project and TER Project, European Commission (EC), Commonwealth of Independent States (CIS) countries);

- (b) Review of the market initiatives (Community of European Railway and Infrastructure Companies (CER), International Union of Railways (UIC), etc.) and their interconnection with the UNECE work;
 - (c) Presentation of the socioeconomic framework of the UNECE countries and alternative scenarios of growth;
 - (d) Identification of methods of work (definitions – assumptions);
 - (e) Identification of criteria that determine the “high-speed train” infrastructure;
 - (f) Identification of criteria of priority infrastructure needs;
 - (g) Inventory of bottlenecks, missing links and other priority transport infrastructure needs and assessment of their development costs;
 - (h) Elaboration of a realistic Master Plan based on investment priorities;
 - (i) Addressing funding questions and financing arrangements;
 - (j) Addressing border crossing questions;
 - (k) Conclusions, recommendations and dissemination of results.
15. The outputs and deliverables are the following:
- (a) Organization, monitoring and co-ordination of the work;
 - (b) Review of related work;
 - (c) Socio-economic framework of the countries concerned and alternative scenarios of growth;
 - (d) Methodology and main assumptions for the work;
 - (e) Collection and analysis of required data;
 - (f) Inventory of priority infrastructure needs and assessment of their costs;
 - (g) Implementation Plans;
 - (h) Inventory of specific priority projects for implementation;
 - (i) Definition of technical and institutional actions required;
 - (j) Inventory of border crossing problems and recommendations;
 - (k) Recommendations for conclusions;
 - (l) Dissemination and public awareness actions.

16. For a successful implementation of these activities, the contribution of the national coordinators and/or national experts is extremely important. Therefore, countries should nominate focal points/national coordinators for the project. In addition, an expert on the development of infrastructure master plans may need to be hired.

IV. Guidance by SC.2

17. SC.2 may wish to consider the above proposal and may wish to provide guidance to the secretariat on further action in this field. The first outline of possible activities for the preparation and implementation of such a master plan is contained in the Annex.

Annex

Work Package Description I

| | | |
|--|--|---|
| Title: | Project Management | Working Package No. 0 |
| Start: | Month 1 | Duration: 12 months |
| Parties involved | Task/Activity of partner | Number of meetings |
| | | Ad hoc Meeting 1 per year (if needed) |
| | | Coordination Group 2 with following attendance |
| SC.2 Secretary | Administration Work | X |
| National Focal Points | Participation – Contribution | X |
| External Consultant(s) | Technical and Scientific Analysis – Reporting | X |
| Observers | | X |
| Objectives: | To ensure the smooth execution of the project and the management of the complex activities and numerous partners from different countries and professions | |
| Description of the work/tasks: | | |
| | Each task of the project will form an Ad hoc Group of experts consisting of the Project Manager (SC.2 Secretary) as leader, external consultants as scientific and technical assistants and the projects' national coordinators/experts from each member country. Experts from other countries interested in the project outside the ECE region will also be invited and nominated as national coordinators. | |
| | The Master Plan's Expert Groups will meet two times during the period of the project for the elaboration of the specific tasks assigned to them according to the work plan. The meetings will be held at Palais de Nations, Geneva. | |
| Administrative/organizational tasks: | | |
| | Preparation of Terms of Reference (TOR) for the consultant(s) | |
| | Preparation of TOR for the work of the national coordinators/experts | |
| | Letters from UNECE to the member States and the non-member States (if interested) for the nomination of national coordinators/experts | |
| | Establishment of list of a national coordinators/experts for each task | |
| | Elaboration of an action plan indicating dates for convening meetings and the submission of deliverables | |
| | Expected results/outputs/deliverables: organization, monitoring system and co-ordination of the work | |
| | Milestones and Criteria: formation of the groups and their meetings | |
| | Interrelation to other work packages: with all packages | |
| Number of missions of the National Focal Points: | 2 missions | |
| Number of missions of the UNECE personnel: | 0 missions | |
| Number of missions of for consultant: | 0 missions (depending on the needs of the project) | |

Work Package Description II

| | | |
|---|---|--|
| Title: | Review of related Work | Working Package No. 1 |
| Start: | Month 1 | Duration: 2 months |
| Parties involved | Task/Activity of partner | Remarks |
| SC.2 Secretary | 1.1 to 1.7 | |
| National Focal Points | 1.1 to 1.7 | |
| External Consultant(s) | 1.1 to 1.7 | |
| Observers | | |
| Objectives: | Review of related work (TEM and TER, EC, CIS countries, etc.) and initiatives (CER, UIC, etc.), policies and studies and their interconnection with the Project | |
| Description of the work/tasks | Task 1.1 | Introduction of the project objectives and degree of their attainment |
| | Task 1.2 | Introduction of the technical characteristics/standards and operational parameters, respective decisions and guidelines for implementation regarding high-speed trains |
| | Task 1.3 | Introduction of the existing networks and plans |
| | Task 1.4 | Introduction of Project's Master Plan related decisions |
| | Task 1.5 | Collection and review of existing relevant studies, assessments and works |
| | Task 1.6 | Trans European Transport Networks (TEN-T) and the TEM and TER Projects analysis |
| | Task 1.7 | European Union railway infrastructure package and its impact in the ECE region |
| Expected results/ Outputs – deliverables | Detailed review and analysis of the existing work and initiatives to avoid duplication of work and take advantage of existing work | |
| Milestones and Criteria | Presentation of respective report | |
| Interrelation to other work packages | Provide data to other WPs | |

Work Package Description III

| | | |
|---|---|--|
| Title: | Socio-economic framework of the ECE countries | Working Package No. 2 |
| Start: | Month 1 | Duration: 3 months |
| Parties involved | Task/Activity of partner | Remarks |
| SC.2 Secretary | 2.1 | |
| National Focal Points | 2.1 | |
| External Consultant(s) | 2.1 to 2.2 | Main responsible |
| Observers | | |
| Objectives: | Analysis of the socio-economic framework of the UNECE countries | |
| Description of the work/ tasks | Task 2.1 | Presentation of the economic and social characteristics of the countries in the ECE region |
| | Task 2.2 | Alternative scenarios of growth |
| | This work will be part of the primary responsibilities of the external consultant. He/she has to complete it with the support of UNECE as well as with the national focal points. The work will be based on existing studies/data available from UNECE, EC, World Bank and other sources aiming at presenting realistic GDP estimates up to 2030 based on alternatives scenarios of growth. Rail transport components and socio-economic aspects will be considered in the framework of the work. | |
| Expected results/ Outputs – deliverables | Economic status and scenarios of growth in the countries of ECE region | |
| Milestones and Criteria | Presentation of the report | |
| Interrelation to other work packages | Provide data for the continuation of the work | |

Work Package Description IV

| | | | |
|--|--|---|-----------------------|
| Title: | Methodology and main assumptions for the work | | Working Package No. 3 |
| Start: | Month | 2 | Duration: 3 months |
| Parties involved | Task/Activity of partner | | |
| SC.2 Secretary | 3.1 to 3.3 | | |
| National Focal Points | 3.1 to 3.3 | | |
| External Consultant(s) | 3.1 to 3.3 | | Main responsible |
| Observers | | | |
| Objectives: | Methodology of work and main assumptions | | |
| Description of the work/tasks | Task 3.1 | Definition of bottlenecks, missing links and other priority high-speed rail transport infrastructure needs on main rail transport corridors of the ECE region | |
| | Task 3.2 | Review and identify the necessary parameters and assumptions for the work: | |
| | (a) | Social, environmental and safety aspects | |
| | (b) | Interoperability in terms of railway rolling stock and railway equipment | |
| | (c) | Interoperability between modes, alternative links, interchanges and multimodal transfer points | |
| | (d) | International connections, extension, interrelation and dynamism towards neighboring regions | |
| | (e) | Intelligent Transport Systems and other operational aspects | |
| | (f) | Transport forecasting | |
| | (g) | Investment requirements, available resources, necessary measures | |
| | Task 3.3 | Identify the main criteria of priority infrastructure needs on the main high-speed rail transport corridors of the ECE region | |
| | This work will be part of the primary responsibilities of the external consultant, to be elaborated with the support and in cooperation with the UNECE Transport Division and the national focal points. | | |
| | Administrative/Organizational Tasks: | | |
| | (a) | Establish criteria for assessment of project priorities | |
| | (b) | Preparation of the diagram of required information | |
| | (c) | Preparation on the questionnaire to be fulfilled by the member countries concerned through the national coordinators/experts; | |
| | (d) | Establish the Guidelines for the data collection from countries concerned | |
| Expected results/ Outputs – deliverables | Methodology and main assumptions for the work | | |
| Milestones and Criteria | Setting up the methodological characteristics of the project | | |
| Interrelation to other work packages | Input required from other WPs | | |

Work Package Description V

| | | |
|---|---|---|
| Title: | Priority infrastructure needs in ECE countries | Working Package No. 4 |
| Start: | Month 5 | Duration: 3 months |
| Parties involved | Task/Activity of partner | |
| SC.2 Secretary | 4.1 to 4.7 | |
| National Focal Points | 4.1 to 4.7 | |
| External Consultant(s) | 4.1 to 4.7 | |
| Observers | | |
| Objectives: | Inventory of bottlenecks, missing links and other priority high-speed rail transport infrastructure needs on main rail transport corridors of the ECE region | |
| Description of the work/tasks | Task 4.1 | Collection of necessary information |
| | Task 4.2 | Analysis and control of information obtained |
| | Task 4.3 | Review and update the ECE region traffic forecasts |
| | Task 4.4 | Establish alternative scenarios for the ECE region Master Plan |
| | Task 4.5 | Review and prioritize proposed projects and plans to address high-speed rail transport infrastructure needs incorporating national and regional concerns. |
| | Task 4.6 | Identify interconnections between high-speed rail networks with other components of the network (sea ports-inland ports-airports-short sea shipping connections-inland waterways, etc.) |
| | Task 4.7 | Identify possible connections and extensions of the high-speed rail networks with neighboring regions (Baltic Sea, Mediterranean Sea, Black Sea, Caspian Sea, North Africa, Euro-Asian, Trans-Africa) |
| | The external consultant is expected to offer his/her scientific and technical assistance and guidance as well as their quality evaluation and possible recommendations for improvement of the work. | |
| Expected results/ Outputs – deliverables | (a) | Collection of required data |
| | (b) | Inventory of priority infrastructure needs and assessment of their costs |
| Milestones and Criteria | Elaboration of the diagram of information required and their collection described | |
| Interrelation to other work packages | Provide data for the continuation of the work | |

Work Package Description VI

| | | | |
|---|--|--|-----------------------|
| Title: | Elaboration of Master Plans | | Working Package No. 5 |
| Start: | Month | 8 | Duration: 2 months |
| Parties involved | Task/Activity of partner | | |
| SC.2 Secretary | 5.1 to 5.3 | | |
| National Focal Points | 5.1 to 5.3 | | |
| External Consultant(s) | 5.1 to 5.3 | | |
| Observers | | | |
| Objectives: | Elaboration of a realistic Master Plan of action covering the identified priority needs on high-speed rail transport corridors, the ECE region Master Plan | | |
| Description of the work/tasks | Task 5.1 | Elaboration of the ECE region high-speed train backbone network | |
| | Task 5.2 | Elaboration of the ECE region high-speed train Master Plans and their alternative implementation scenarios | |
| | Task 5.3 | GIS presentation of the ECE region high-speed train Master Plan. | |
| | The external consultant is expected to offer his/her scientific and technical assistance on the work. | | |
| Expected results/ Outputs – deliverables | (a) | TEM and TER Region Master Plans | |
| | (b) | GIS presentation of the TEM and TER Region backbone networks and Master Plans | |
| Milestones and Criteria | Presentation of the Master Plan | | |
| Interrelation to other work packages | Provide data for the continuation of the work | | |

Work Package Description VII

| | | |
|---|--|---|
| Title: | Addressing funding questions | Working Package No. 6 |
| Start: | Month 8 | Duration: 3 months |
| Parties involved | Task/Activity of partner | |
| SC.2 Secretary | 6.1 to 6.6 | |
| National Focal Points | 6.1 to 6.6 | |
| External Consultant(s) | 6.1 to 6.6 | |
| Observers | | |
| Objectives: | Addressing funding questions for the implementation of the TEM and TER Region Master Plans | |
| Description of the work / tasks | Task 6.1 | Inventory of specific projects for the implementation of the proposed ECE region high-speed train Master Plan |
| | Task 6.2 | Estimate of budget for the implementation of the proposed ECE region high-speed train Master Plan |
| | Task 6.3 | Possibilities of stage construction |
| | Task 6.4 | Definition on a macro-scale of the necessary technical and institutional actions for assisting the implementation of the proposed ECE region high-speed train Master Plan |
| | Task 6.5 | Estimate of financial resources available |
| | Task 6.6 | Remarks on the perspectives to construct the ECE region high-speed train backbone network |
| | The external consultant is expected to offer quality control and possible recommendations for the improvement of the work. | |
| Expected results/ Outputs – deliverables | (a) | Inventory of specific priority projects for implementation |
| | (b) | Estimate of implementation costs |
| | (c) | Definition of technical and institutional actions required |
| Milestones and Criteria | Inventory of projects | |
| Interrelation to other work packages | Contributes to the completion of the work | |

Work Package Description VIII

| | | | |
|---|---|---|-----------------------|
| Title: | Addressing Border crossing questions | | Working Package No. 7 |
| Start: | Month | 8 | Duration: 3 months |
| | | | Remarks |
| Parties involved | Task/Activity of partner | | |
| SC.2 Secretary | 7.1 | | |
| National Focal Points | 7.1 | | |
| External Consultant(s) | 7.1 | | |
| Observers | | | |
| Objectives: | Addressing border crossing questions | | |
| Description of the work/tasks | Task 7.1 | Border crossing problems inventory on the ECE region high-speed train backbone networks and improvement recommendations | |
| Expected results/ Outputs – deliverables | (a) | Inventory of border crossing problems | |
| | (b) | Recommendations for improvement | |
| Milestones and Criteria | Presentation of reports | | |
| Interrelation to other work packages | Contributes to the completion of the work | | |

Work Package Description IX

| | | | |
|---|--|---|-----------------------|
| Title: | Addressing funding questions | | Working Package No. 8 |
| Start: | Month | 3 | Duration: 10 months |
| | | | Remarks |
| Parties involved | Task/Activity of partner | | |
| SC.2 Secretary | 8.1 to 8.4 | | |
| National Focal Points | 8.1 to 8.4 | | |
| External Consultant(s) | 8.1 | | |
| Observers | | | |
| Objectives: | Presentation of conclusions and recommendations. Develop necessary actions to increase awareness for the project implementation to the stakeholders and interested parties and disseminate the results of the present work and the importance of the ECE region high-speed trains Master Plan. | | |
| Description of the work/tasks | Task 8.1 | Preparation and presentation of final report with conclusions and recommendations | |
| | Task 8.2 | Presentation of projects' results on the internet | |
| | Task 8.3 | Publication of a project newsletter, brochures and a summary report, findings and conclusions | |
| | Task 8.4 | Organization of workshops to present the progress of the project and the final results | |
| | The external consultant is expected to offer quality control and possible recommendations for the improvement of the work. | | |
| Expected results/ Outputs – deliverables | (a) | Final Report | |
| | (b) | Dissemination | |
| | (c) | Public awareness | |
| | (d) | Follow-up preparations | |
| Milestones and Criteria | Preparation of the report – publication and material for presentation | | |
| Interrelation to other work packages | Completion of the work | | |

Work Time Plan
(English only)

| WP | Year 2013 | | | | | | | | | | | |
|-----|----------------------------------|--------------|----------|----------|--------------|----------|----------|--------------|----------|-----------|-----------|-----------|
| | MONTHS | | | | | | | | | | | |
| | 1 Jan | 2 Feb | 3 Mar | 4 Apr | 5 May | 6 Jun | 7 Jul | 8 Aug | 9 Sep | 10 Oct | 11 Nov | 12 Dec |
| WP0 | [Yellow bar spanning all months] | | | | | | | | | | | |
| WP1 | [Yellow bar] | | | | | | | | | | | |
| WP2 | [Yellow bar] | | | | | | | | | | | |
| WP3 | | [Yellow bar] | | | | | | | | | | |
| WP4 | | | | | [Yellow bar] | | | | | | | |
| WP5 | | | | | | | | [Yellow bar] | | | | |
| WP6 | | | | | | | | [Yellow bar] | | | | |
| WP7 | | | | | | | | [Yellow bar] | | | | |
| WP8 | [Yellow bar spanning all months] | | | | | | | | | | | |