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## Economic Commission for Europe

### Inland Transport Committee

#### Working Party on Transport Trends and Economics

##### Twenty-ninth session

Geneva, 5–7 September 2016

Item 9 of the provisional agenda

##### **Urban mobility and Public Transport: pan-European master plan for cycling**

## **Methodology on the infrastructure module of the Cycling Master Plan**

### **Note by the secretariat**

#### **I. Mandate**

1. The Inland Transport Committee during its seventy-sixth session (25–27 February 2014) encouraged governments and municipalities to support further research on urban transport and mobility provided by the United Nations Economic Commission for Europe (UNECE), and suggested that this topic be addressed in the agenda of the Working Party on Transport Trends and Economics (WP.5) (ECE/TRANS/240, para 11). Furthermore at its seventy-seventh session (24–26 February 2015) decided to regularly review the developments in urban mobility and transport, and particularly, the inter-linkages between urban, regional, national and international transport networks and services. In this regard, the Committee requested WP.5 to follow-up on this matter (ECE/TRANS/248, para 18).

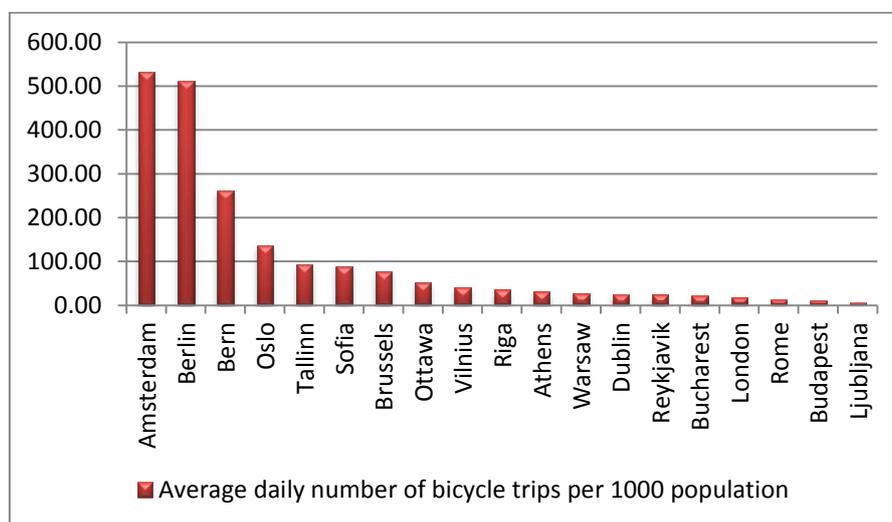
## II. Development of a pan-European master plan for cycling in the ECE region in cooperation with Transport, Health and Environment Pan-European Programme (THE PEP)<sup>1</sup>

2. Cities can ensure a more sustainable transport system if they provide the necessary infrastructure and promote cycling and walking as a type of the non-motorized transport, in particular for shorter trips. In connection with urban public transport, however, cycling and walking can also be promoted for the longer trips (including recreation).

3. A good indicator of success in promoting cycling is an average daily number of bicycle trips per 1000 population. The data show that for the majority of UNECE capitals<sup>2</sup> less than one person in 10 would make on average a trip by a bicycle (figure 1). At the same time, there are cities that are clear champions in bicycle use with one in two (Amsterdam, Berlin) or one in four persons on average using bicycles (Bern).

Figure 1

### Bicycle use in UNECE capitals per 1000 population, 19 capitals, 2011



Source: UNECE

4. For the infrastructure, it is not only its length that is important but also its quality. Information however on the quality of bicycle lanes is not available. It is unknown, whether the bicycle lanes are separated from motorized transport infrastructure and pedestrians sidewalks to prevent collisions with motorized transport or pedestrians. It is also unknown, whether walking and cycling infrastructure at intersections with roads is given priority: short waiting time for crossing, convenient on-ground passages for cyclists and pedestrians. It would be expected that cities with clearly separated infrastructure that provides more safety and convenience for cyclists and pedestrians, should be more successful in achieving higher demand for both cycling and walking.

<sup>1</sup> At the 4th High-level Meeting on Transport, Health and Environment (Paris, April 2014) governments adopted the Paris Declaration, including a clear call for member States to promote cycling and to develop a pan-European master plan for cycling within the framework of THE PEP.

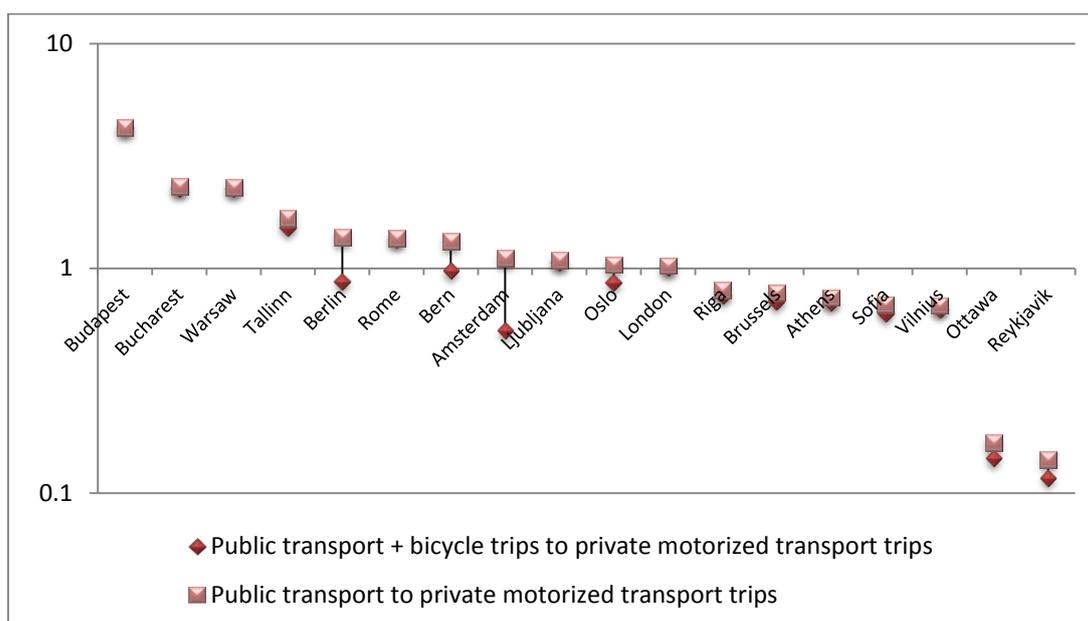
<sup>2</sup> ECE Publication on Sustainable Urban Mobility and Public Transport, 2016

5. When it comes to the use of bicycles in combination with public transport for longer trips, assessment could be based on availability of bicycle parking infrastructure and its occupancy at main public transport stations. Such data are however absent.

6. It is interesting to verify how the use of bicycles impacts the ratio of public transport to private trips. If the bicycle trips are added to public transport trips, there are several cities (Amsterdam, Berlin, Bern and Oslo), for which motorized private transportation is not prevailing anymore for urban mobility (figure 2.). There are several other cities for which the ratio: public transport trips and bicycle trips to private motorized transport trips visibly improves (Ottawa, Reykjavik and Tallinn).

Figure 2

**Changes in relation between rides with urban public transport to private motorized transport by rides with bicycle in 18 UNECE capitals**



Source: UNECE

7. Cycling and walking should be encouraged through availability of adequate and safe infrastructure, especially for short trips. Cycling and walking gives the very much needed physical activity to citizens. Therefore it helps to improve citizens' health directly. Furthermore, by replacing or limiting the car travel it also contributes to decreasing air pollution from transport, hence affects the citizens health also indirectly. To attract citizens to cycling and walking, the infrastructure should be separated from the motorized transport infrastructure and safe intersections provided. It should also be convenient and hence prioritize walking and cycling at road intersections: shorter waiting times, on-ground passages.

8. Cycling and walking should be encouraged in connection with public transport for longer trips. Safe and convenient pedestrians and cycling roads should provide easy connections to public transport stations. For the cyclist, the stations should provide adequate parking infrastructure for bicycles. Cycling and Walking should be considered integral part of a sustainable public transport development plan.

9. In order to achieve these objectives a specific project/module on infrastructure development could be undertaken under the auspices of UNECE WP.5 and in cooperation

with THE PEP as part of the strategic pan-European master plan for cycling in the ECE region that is currently under development.

10. The infrastructure module of the cycling Master Plan should have two dimensions: an international one, where cycling is understood more as a form of recreation and linked to the transport industry, and a city-level one, where cycling is developed as an integrated means of public transport.

11. As far as the international dimension of the infrastructure module of the cycling Master Plan is concerned, this could follow the methodology already applied for the infrastructure Master Plans developed by ECE. The existing International Corridors should be used however, investments should be needed for signs and signals along these corridors that would ensure safety of the cyclists. Also analysis of traffic flows; border crossings issues etc. should be examined.

12. As far as the City level dimension is concerned, the methodology used by the ECE Master Plans might need to be adapted to some extent. The International/National backbone transport networks would be replaced by the Cities Public Transport Networks. A Cycling Lane network can be efficient and of added value for the citizens only if it is integrated in the Public Transport Network. Therefore, we are discussing again for the development of a network of cycling lanes that should be efficiently connected to the existing public transport network by taking into consideration traffic flows forecasts, intermodality issues, safety of passengers etc. Thus, the challenges of identifying, prioritizing, designing and financing transport (cycling) infrastructure remain the same.

### **III. Guidance by WP.5**

13. WP.5 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

| Title: Project Management       |   | Working Package No. 0                           |   |
|---------------------------------|---|---|---|
| Start: Month 1                  | Duration: 18 months                           | Number of meetings                              |   |
| Parties involved                | Task/Activity of partner                      | Expert Groups<br>2 with following<br>attendance | Coordination<br>Group 2<br>with following<br>attendance |
| Project Manager                 | Administration Work – Project Management      | X   | X   |
| THE PEP Coordinator/secretariat | THE PEP coordination                          | X   | X   |
| National Focal Points           | Participation – Contribution                  | X   | X   |
| External Consultant(s)          | Technical and Scientific Analysis – Reporting | X   | 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 / capitals and professions

#### Description of the work/tasks:

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 at least 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
- Distribution of questionnaire(s) to the National Focal Points
- Preparation and organization of the coordination group meetings

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 the consultant:            | 2 missions (depending on the needs of the project / trips per Capital?) |

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*Work Package Description*

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|--|---|---|
| Title:                                   | Review of related Work  | <b>Working Package No. 1</b>  |
| Start: Month 1                           | Duration: 3 months  | Remarks   |
| Parties involved                         | Task/Activity of partner  |   |
| Project Manager                          | 1.1 to 1.6  |   |
| THE PEP Coordinator                      | 1.1 to 1.6  |   |
| National Focal Points                    | 1.1 to 1.6  |   |
| External Consultant(s)                   | 1.1 to 1.6  |   |
| Observers                                |   |   |
| Objectives:                              | Review of related work (National Cycling Policies/Strategies, etc.) and initiatives (European Commission, European Cyclists' Federation (ECF) etc.), policies and studies and their interconnection with the Project/Analysis of developments in the world and the ECE region |   |
| Description of the work/tasks            | Task 1.1  | Introduction to cycling (International/City level) – characteristics, benefits and challenges   |
|  | Task 1.2  | International and City level Cycling technical specifications/standards, respective decisions and guidelines for their implementation |
|  | Task 1.3  | Summary of the existing International and City level Cycling lanes technical, operational and maintenance parameters                  |
|  | Task 1.4  | Collection and review of existing relevant studies, assessments and works   |
|  | Task 1.5  | Introduction of the existing and future Cycling Lanes networks and plans in International and City levels                             |
|  | Task 1.6  | European Union cycling funded projects and initiatives 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(s)  |   |
| Interrelation to other work packages     | Provides the necessary data to other WPs  |   |

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*Work Package Description*

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|--|---|------------------------------|
| Title:   | Methodology and main assumptions for the work   | <b>Working Package No. 2</b> |
| Start: Month                                   | 2   | Duration: 3 months           |
| Parties involved                               | Task/Activity of partner  |                              |
| Project Manager                                | 2.1 to 2.4  |                              |
| THE PEP Coordinator                            | 2.1 to 2.4  |                              |
| External Consultant(s)                         | 2.1 to 2.4  | Main responsible             |
| Objectives:                                    | Methodology of work and main assumptions  |                              |
| Description of the work/<br>tasks              | <p>Task 2.1      Review and identification of the necessary parameters and assumptions for the work:</p> <ul style="list-style-type: none"> <li>• Social, environmental and safety aspects;</li> <li>• Interoperability / Intermodality between Cycling and Public transport modes;</li> <li>• International connections, interrelations and dynamism towards neighbouring regions;</li> </ul> <p>Task 2.2      Transport demand and traffic forecasting, development scenarios;</p> <p>Task 2.3      Elaboration and distribution of the questionnaires to the UNECE countries / Capitals (or major cities);</p> <p>Task 2.4      Analysis and processing of the returned questionnaires;</p> <p>This work will be among the main responsibilities of the external consultant, to be elaborated with the support and in cooperation with the Project Manager and the THE PEP coordinator. The work will be based on the UNECE AGR network and public transport networks provided by the Cities.</p> <p>Administrative/Organizational Tasks:</p> <ul style="list-style-type: none"> <li>• Establishment of criteria for assessment of project priorities;</li> <li>• Preparation of list of required information;</li> <li>• Preparation of the questionnaire to be fulfilled by the member Countries/ Cities concerned through the National Coordinators/experts;</li> <li>• Establish the rules for the data collection from the Countries/ Cities concerned</li> </ul> |                              |
| Expected results/<br>Outputs –<br>deliverables | Methodology and main assumptions for the work   |                              |
| Milestones and<br>Criteria                     | Setting up the methodological characteristics of the project  |                              |
| Interrelation to<br>other work<br>packages     | Input required from other WPs   |                              |

*Work Package Description*

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|--|--------------------------|------------------------------------|
| Title: Cycling Lanes status and needs in the UNECE member Countries / Cities |                          | <b>Working Package No. 3</b>       |
| Start: Month 4   | Duration: 4 Months       | Remarks                            |
| Partners involved  | Task/Activity of partner |                                    |
| Project Manager  | 3.1 to 3.11              | UNECE main responsible             |
| THE PEP Coordinator  | 3.1 to 3.11              | Provision of THE PEP data          |
| National Focal Points  | 3.1, 3.3 to 3.11         | Provision of National/ Cities data |
| External Consultant  | 3.2 to 3.11              | Elaboration of the Package         |

Objectives: Inventory of the present status and future Cycling Lanes development plans in the region

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|--|--|---|
| Description of the work/tasks:         | Task 3.1   | Collection of necessary information and data  |
|  | Task 3.2   | Analysis and control of information obtained  |
|  | Task 3.3   | Approved or proposed national legislation and standards   |
|  | Task 3.4   | Cycling Lanes links in operation, under construction, planned (accompanied by maps)             |
|  | Task 3.5   | Pre-feasibility, feasibility and alignment studies (under elaboration, approved)                |
|  | Task 3.6   | Technical parameters (speed, gradient, stations, safety measures etc.)                          |
|  | Task 3.7   | Existing and future traffic flows   |
|  | Task 3.8   | Information and communication systems at present, in the future                                 |
|  | Task 3.9   | Agreements on Cycling Lanes with neighboring countries  |
|  | Task 3.10  | Construction costs and timing, maintenance and operation costs                                  |
|  | Task 3.11  | Financial sources – available and proposed  |
| Expected results/ Outputs-deliverables | 1.   | Collection of data needed   |
|  | 2.   | Inventory of Cycling Lanes needs and planned development in the UNECE member Countries / Cities |
| Milestones and Criteria                | Elaboration of diagram of information required and results of their collection evaluated |   |
| Interrelation to other work packages:  | Provide data for the continuation of the work  |   |

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*Work Package Description*

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|---|----------------------------------|---|
| Title: Elaboration of Environmental – Health benefits analysis by using existing tools (HEAT - FoFITS) from Cycling development |                                  | <b>Working Package No. 4</b>  |
| Start: Month 2  | Duration: 9 months               | Remarks   |
| Parties involved  | Task/Activity of partner         |   |
| Project Manager   | 4.1 to 4.4                       |   |
| THE PEP Coordinator/secretariat   | 4.1 to 4.4                       |   |
| External Consultant(s)  | 4.1 to 4.4                       | Main responsible  |
| Objectives:   | Analysis based on existing tools |   |
| Description of the work/tasks   | Task 4.1                         | Review of existing tools requirements and preparation of appropriate questionnaires in order to facilitate data collection; |
|   | Task 4.2                         | Identification of the main parameters that these tools should include and analyse   |
|   | Task 4.3                         | Use of the tools based on data received for International and Cities level;   |
|   | Task 4.4                         | Analysis of case studies the results of which will be included at the final report  |
| Expected results/Outputs – deliverables   | Tools analysis                   |   |
| Milestones and Criteria   | Development of case studies      |   |
| Interrelation to other work packages  | Input required from other WPs    |   |

*Work Package Description*

|   |                          |   |
|---|--------------------------|---|
| Title: Elaboration of pan-European master plan for cycling at International level – |                          | <b>Working Package No. 5</b>            |
| Start: Month 8  | Duration: 7 Months       | Remarks                                 |
| Partners involved   | Task/Activity of partner |   |
| Project Manager   | 5.1 to 5.14              |   |
| THE PEP Coordinator   | 5.1 to 5.14              |   |
| External Consultant   | 5.1 to 5.14              | Elaboration of this part of methodology |

Objectives:

Elaboration of the detailed Master Plan for Cycling Lanes system at International level including the respective GIS maps

|                               |           |   |
|-------------------------------|-----------|---|
| Description of the work/tasks | Task 5.1  | Economic and social characteristics as well as economic growth analysis in ECE region;  |
|                               | Task 5.2  | Design speeds, upgrading of existing lanes/building of new lanes, types of operation (types of bikes);  |
|                               | Task 5.3  | Construction, maintenance and operation average unit costs (new links, rehabilitation);   |
|                               | Task 5.4  | Information, communication and signaling systems as well as other safety features/technical parameters;   |
|                               | Task 5.5  | Maintenance, operation and management;  |
|                               | Task 5.6  | Costs and benefits/revenues, economic and risk analyses, social and environmental impacts;  |
|                               | Task 5.7  | International Network of Cycling Lanes including its connections to neighboring countries and its position vis-à-vis the EU transport core network and the ECE AGR agreement; |
|                               | Task 5.8  | Alignment of individual corridors/links;  |
|                               | Task 5.9  | Construction schedule, priorities, phasing, Master Plan time limits (2030 and 2050);  |
|                               | Task 5.10 | Construction, maintenance and operation costs;  |
|                               | Task 5.11 | GIS maps of International Network of Cycling Lanes in the individual member Countries and in the whole ECE region;  |
|                               | Task 5.12 | Identification of interconnections with other transport components (railways, sea ports-inland ports-airports);   |
|                               | Task 5.13 | Identification of possible connections and extensions to other regions (East Asia etc.)   |
|                               | Task 5.14 | Identification of possible missing links, border crossings bottlenecks and of other inefficiencies along the ECE region.  |

|                                       |   |
|---------------------------------------|---|
| Expected results/Outputs-deliverables | 1. International Network of Cycling Lanes;<br>2. GIS presentation of the International Network of Cycling Lanes and its individual links on the maps of the region as well as maps of individual Countries; |
|---------------------------------------|---|

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|--------------------------|--|
| Milestones and Criteria: | Presentation of the International Network of Cycling Lanes |
|--------------------------|--|

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|---------------------------------------|---|
| Interrelation to other work packages: | Provide major data for the continuation of the work |
|---------------------------------------|---|

*Work Package Description*

| Title: Elaboration of pan-European master plan for cycling at Cities level – |                          | <b>Working Package No. 6</b>            |
|--|--------------------------|---|
| Start: Month   | Duration:                | Remarks                                 |
| 9  | 7 Months                 |   |
| Partners involved  | Task/Activity of partner |   |
| Project Manager  | 6.1 to 6.15              |   |
| THE PEP Coordinator  | 6.1 to 6.15              |   |
| External Consultant  | 6.1 to 6.15              | Elaboration of this part of methodology |

## Objectives:

Elaboration of the detailed Master Plan for Cycling Lanes system at Cities level including the respective Cities GIS maps

- Task 6.1 Economic and social characteristics as well as economic/ population growth analysis for each city;
  - Task 6.2 Basic design principles – size of cities/agglomerations, bikes parking spaces, distances from train stations/ buses-trams stops, their design, equipment and services;
  - Task 6.3 Design speeds, upgrading of existing City lanes/building of new lanes, types of operation (types of bikes);
  - Task 6.4 Construction, maintenance and operation average unit costs (new links, rehabilitation);
  - Task 6.5 Information, communication and signaling systems as well as other safety features/technical parameters;
  - Task 6.6 Maintenance, operation and management;
  - Task 6.7 Costs and benefits/revenues, economic and risk analyses, social and environmental impacts;
  - Task 6.8 Cities' Networks of Cycling Lanes including its connections to Cities public transport networks ;
  - Task 6.9 Alignment of individual lanes/links;
  - Task 6.10 Construction schedule, priorities, phasing, Master Plan time limits (2030 and 2050);
  - Task 6.11 Construction, maintenance and operation costs;
  - Task 6.12 GIS maps of Cities' Networks of Cycling Lanes for each City;
  - Task 6.13 Identification of interconnections with public transport components (buses, trams, light trains, underground);
  - Task 6.14 Identification of connections with the International Network of Cycling Lanes;
  - Task 6.15 Identification of possible missing links along Cities Cycling networks or with public transport networks.
1. Cities' Networks of Cycling Lanes;
  2. GIS presentation of Cities' Networks of Cycling Lanes;

Presentation of Cities' Networks of Cycling Lanes

Provide major data for the continuation of the work

*Work Package Description*

|                                     |                             |
|-------------------------------------|-----------------------------|
| Title: Addressing funding questions | <b>Working Package No 7</b> |
|-------------------------------------|-----------------------------|

|                 |                    |         |
|-----------------|--------------------|---------|
| Start: Month 12 | Duration: 5 Months | Remarks |
|-----------------|--------------------|---------|

|                   |                          |
|-------------------|--------------------------|
| Partners involved | Task/Activity of partner |
|-------------------|--------------------------|

|                 |            |
|-----------------|------------|
| Project Manager | 7.1 to 7.6 |
|-----------------|------------|

|                                 |            |
|---------------------------------|------------|
| THE PEP Coordinator/secretariat | 7.1 to 7.6 |
|---------------------------------|------------|

|                     |            |                       |
|---------------------|------------|-----------------------|
| External Consultant | 7.1 to 7.6 | Elaboration of the WP |
|---------------------|------------|-----------------------|

## Objectives:

Addressing funding questions for the implementation of the International Network of Cycling Lanes and Cities' Networks of Cycling Lanes

|                               |          |  |
|-------------------------------|----------|--|
| Description of the work/tasks | Task 7.1 | Estimate of budget for the implementation of both Cycling Lanes networks;  |
|                               | Task 7.2 | Possibilities of stage construction;   |
|                               | Task 7.3 | Definition on a macro-scale of the necessary technical and institutional actions for assisting the implementation of the proposed Cycling Lanes networks ; |
|                               | Task 7.4 | Estimate of financial resources available and of potential revenues;   |
|                               | Task 7.5 | Possibilities and potential sources of funding the proposed Cycling Lanes networks including the EU grants and project bonds, PPP and BOT schemes          |
|                               | Task 7.6 | Remarks on the perspectives to construct the Cycling Lanes networks;   |

|                                       |    |  |
|---------------------------------------|----|--|
| Expected results/Outputs-deliverables | 1. | Estimate of implementation costs and potential revenues    |
|                                       | 2. | 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*

Title: Conclusions/Recommendations – Public awareness actions and dissemination of results – Follow-up preparations **Working Package No 8**

| Start: Month        | Duration:                | Remarks  |
|---------------------|--------------------------|--|
| 12                  | 7 Months                 |  |
| Partners involved   | Task/Activity of partner |  |
| Project Manager     | 8.1 to 8.4               | Quality control                                |
| THE PEP Coordinator | 8.1 to 8.4               | Recommendations                                |
| THE PEP secretariat | 8.1 to 8.4               | Public awareness and dissemination of results  |
| External Consultant | 8.1                      | Formulation of conclusions and recommendations |

Objectives: Presentation of conclusions and recommendations. Development of necessary actions to increase awareness for the implementation of the Cycling Lanes Networks to the stakeholders and interested parties and dissemination of its conclusions, results and outcomes.

| Description of the work/tasks | Task 8.1   | Task 8.2  | Task 8.3   | Task 8.4  |
|-------------------------------|--|---|--|---|
|                               | Presentation of final report with conclusions and recommendations; | Presentation of the pan-European Cycling Master Plan in International and Cities level; | Publication of a project newsletter, brochures and a summary report, findings and conclusions; | Organization of workshops to present the progress of the project and the final results; |

| Expected results/Outputs-deliverables | 1.           | 2.            | 3.               | 4.                     |
|---------------------------------------|--------------|---------------|------------------|------------------------|
|                                       | Final Report | Dissemination | Public awareness | Follow-up preparations |

Milestones and Criteria: Preparation of the pan-European Cycling Master Plan final report and materials for presentation

Interrelation to other work packages: Completion of the work

## Work Time Plan

