



**Economic and Social  
Council**

Distr.  
GENERAL

TRANS/WP.6/AC.3/2003/2  
1 April 2003

ENGLISH ONLY

---

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

Working Party on Transport Statistics

Ad hoc Meeting on Harmonization of Sustainable Urban  
and Regional Transport Statistics  
(Prague, 15-16 May 2003)

**CONSIDERATIONS REGARDING THE DEVELOPMENT OF INDICATORS TO  
MONITOR THE INTEGRATION OF ENVIRONMENTAL AND HEALTH ASPECTS  
INTO TRANSPORT POLICIES, AND THEIR IMPACTS ON HEALTH AND THE  
ENVIRONMENT<sup>1</sup>**

**Submitted by the WHO European Centre for Environment and Health, Rome (Italy)**

Note: On its fifty-third session (25-27 November 2002), the Working Party on Transport Statistics (TRANS/WP.6/143, paras. 24 and 25), encouraged delegates to prepare documents for the Ad hoc meeting on Harmonization of Sustainable Urban and Regional Transport Statistics to be held in Prague on 15 and 16 May 2003. In reply to this invitation, the World Health Organization (WHO) has prepared a document which is reproduced below.

\* \* \*

**I. INTRODUCTION**

Much data is currently collected in European countries that could inform about the effects of transport on health and the environment and on progress towards the achievement of greater integration of health and environmental consideration in the development of transport policies. While some progress has been achieved in the field of monitoring the integration of environmental aspects into transport policies, as shown by the set of indicators and reporting

---

<sup>1</sup> This paper has been developed based on the following documents: "Review Of Implementation And Effectiveness Of Existing Policy Instruments On Transport, Environment And Health, And Of Their Potential For Health Gain", EUR/00/5026094/2 and "Establishment Of A Set Of Indicators To Monitor The Integration Of Environmental And Health Aspects Into Transport Policies, And Their Impacts On Health And The Environment" ECE/AC.21/2003/5 - EUR/03/5040828/5

systems on Transport and the Environment developed by the EEA and the OECD (see below), health aspects have not yet been fully incorporated in these systems. In addition, reports and data from Newly Independent States and Southern Eastern European countries have not yet been included.

The need to “implement and, if needed, further develop systems for monitoring transport-related exposures and impacts on environment and health” was already identified in the plan of action of the Charter on Transport, Environment and Health<sup>2</sup>, along with a call to the WHO and other international organizations to “Develop indicators and guidelines for measuring and monitoring the health effects of transport on the general population and in groups and areas at higher risk, and assess the effectiveness of interventions to minimize those effects”. At present, “the establishment of a set of indicators to monitor the integration of environmental and health aspects into transport policies” figures as one of the identified priority activities to be carried out under the auspices of the joint WHO and UNECE Transport, Health and the Environment Pan-European Programme (THE PEP)<sup>2</sup>. Such a need derives from the understanding that transport activities result in a complex range of effects on human health. These include accidents, health effects of noise and air pollution, effects on levels of physical activity practiced by the general population, e.g. through cycling and walking<sup>3</sup>, psycho-social effects (e.g. such as those caused by community severance and restrictions to the freedom of movement in children) and effects related to climate change. While indicators are already being used to monitor some of these effects (e.g. deaths and injuries caused by accidents and, though to a lesser extent, some health end-points related to air pollution and noise), others (e.g. physical activity) have not yet been addressed adequately, and will require significant additional work to be undertaken in the years to come to fill this gap.

The political and economical significance of improving the assessment of health effects such as those related to physical activity in relation to transport on health has been underlined by a study carried out in Norway. The study included some of the health effects of walking and cycling (some forms of cancer, high blood pressure, diabetes type II, and muscle-skeleton diseases) and the barrier effect related to motorised road traffic (which is assumed to reduce the number of trips undertaken on foot or by bike) in cost-benefit analyses of walking and cycling track networks in three Norwegian cities. The analyses resulted in net benefit-cost ratio of 4.09, 14.34 and 2.94 for the three cities (Hokksund, Hamar and Trondheim) covered by the study, respectively, supporting the economic soundness of investing in walking and cycling infrastructure.<sup>4</sup> The fact that many States do not consider walking and cycling as “real” transport modes, and, therefore, do not collect statistics for these transport means represents a serious limitation to the present ability to

---

<sup>2</sup> Transport, Health and Environment Pan European Programme (THE PEP) adopted at the Second High-level Meeting on Transport, Environment and Health (5 July, 2002). THE PEP work plan (ECE/AC.21/2002/9-EUR/02/5040828/9) and further information on THE PEP are available at URL <http://www.unece.org/the-pep>.

<sup>3</sup> Physical activity is known to have a major role on reducing risks for cardiovascular diseases, hypertension, diabetes, colon cancer and other conditions related to overweight and obesity. According to the World Health Report 2002, the lack of physical activity is correlated to ca 8 –10 % of total mortality in some of the Newly Independent States.

<sup>4</sup> Saelensminde, K. Walking and cycling track networks in Norwegian Cities – Cost-benefit analyses including health effects and external costs of road traffic. Institute of Transport Economics, Norway (2002) TOI report 567/2002 – (Norwegian language)

quantify changes in levels of walking and cycling and consequently on the risks of several non-communicable diseases, and their cost to society.

This paper presents an overview of on-going relevant activities, highlights the results of a critical analysis carried out by the WHO on existing sets of indicators, and presents proposed next steps for carrying out international work in this field, under the framework of the implementation of the Transport, Health and Environment Pan-European Programme (THE PEP)<sup>5</sup>.

## II. RELEVANT ONGOING ACTIVITIES

Four initiatives are especially relevant for the further development of indicators to monitor and report on the integration of environmental and health aspects into transport policies and to assess the impacts of these on health and the environment under the framework of THE PEP:

### (a) EEA TERM (Transport and Environment Reporting Mechanism) initiative

Following the mandate given by the 1998 Cardiff summit of the European Council, the European Environment Agency – in cooperation with the European Commission – has developed an indicator-based reporting system to monitor the integration of environmental concerns into EU transport policies<sup>6</sup>. The first two indicator-based reports developed under the Transport and Environment Reporting Mechanism (TERM 2000, TERM 2001) covered the 15 members of the European Union. In its latest report (2002), the TERM scope has been broadened to include in the assessment also the 13 EU accession countries. Eurostat and UNECE are the major providers of the statistics on which the reports build. The TERM set of indicators includes some of relevance to health (addressing traffic accident fatalities and injuries, some aspects of exposure to air pollution and noise). It also includes indicators to track progress in policy areas such as pricing (e.g. internalisation of externalities related to environmental and health impacts), infrastructure development, technology, management integration.

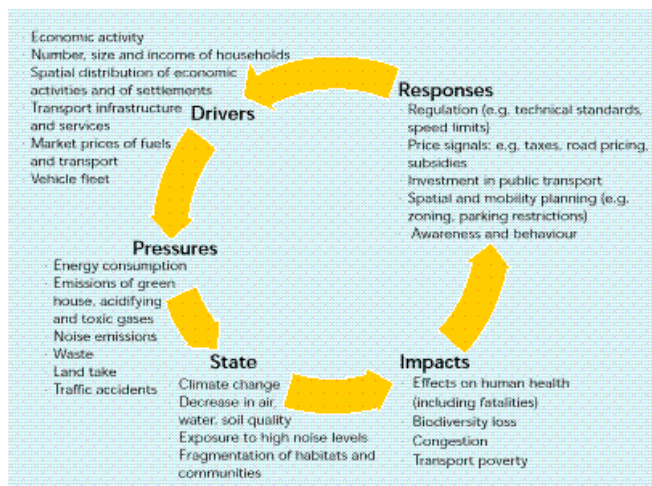
The primary sources of data and statistics used by TERM are collected through the EEA and Eurostat networks, which include the European Information and Observation Network (EIONET), and national statistical offices.

The TERM set of indicators is framed within the so-called DPSIR (Drivers, Pressures, State, Impacts and Responses) conceptual model. This model allows for a distinction to be made between the pressures exerted on the environment by transport, the effects of these pressures (e.g. in terms of air pollution, noise and accidents and external costs), and policy responses. The application of the model to transport and the environment is showed in the following figure:

---

<sup>5</sup> "Establishment Of A Set Of Indicators To Monitor The Integration Of Environmental And Health Aspects Into Transport Policies, And Their Impacts On Health And The Environment" ECE/AC.21/2003/5 - EUR/03/5040828/5, available at URL [www.unece.org/the-pep](http://www.unece.org/the-pep)

<sup>6</sup> Additional information on TERM, TERM reports published to-date and indicator fact sheets can be found on the web site: [http://themes.eea.eu.int/Sectors\\_and\\_activities/transport](http://themes.eea.eu.int/Sectors_and_activities/transport) (accessed on 13 January 2003)



TERMS provides a valuable departure point for further developing the monitoring of environmental and health effects of transport policies at the pan-European level. In particular, consideration could be given to revising and expanding the TERM indicators with a view to fully incorporating health aspects, as well as to extending, as much as possible, the geographic scope of the system to countries with economies in transition, with appropriate adaptations. This work could be developed taking into account an on-going initiative within the WHO to establish indicators for environmental health reporting, and aim at assessing the feasibility and take steps necessary to cover health aspects that so far have remained relatively neglected (such as those related to physical activity and noise).

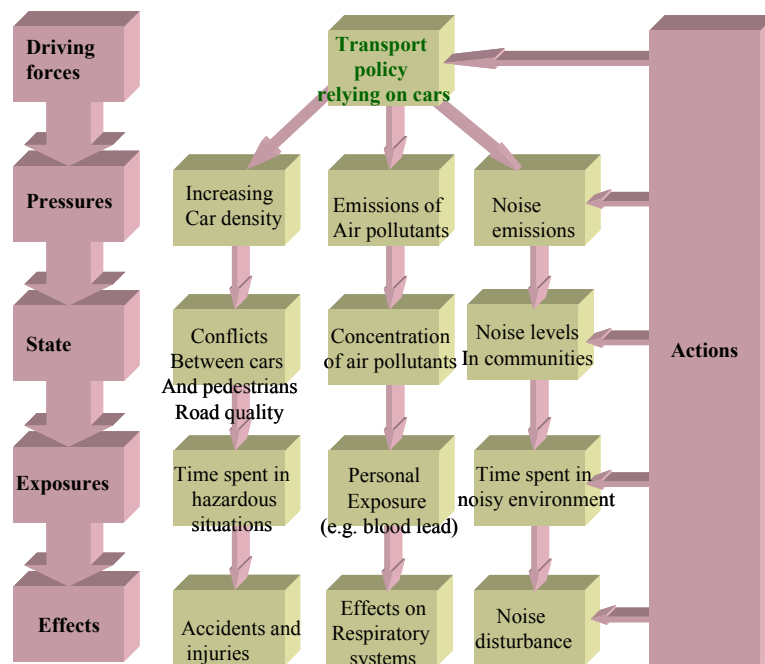
(b) WHO development of a core-set of indicators for environmental health reporting in the European region

The WHO European Centre for Environment and Health in Bonn is implementing an Environmental Health (EH) indicator system based on internationally agreed methodology and comparable data<sup>7</sup>. This monitoring and reporting system is part of the WHO efforts to provide its member States with tools that facilitate the assessment of health effects related to environmental conditions. The system will be one of the components of an “information platform” to be recommended for endorsement to the 4<sup>th</sup> Ministerial Conference on Environment and Health, Budapest, 2004. The indicators have been developed in collaboration with the EEA, in order to maximize the possibility of data exchange between these two organizations and member States. The core-set of indicators aims at assuring uniform assessments across risk factors, coherent reporting from local to national level, and comparability between countries by proposing a harmonized reporting system and a standard format of communicating the evidence to decision-makers. The core-set has been pilot tested in a number of western and eastern European countries, with a view to maximizing the geographic coverage and the participation in the system of countries from all over the region. The core-set includes indicators relevant to monitor some of

<sup>7</sup> Additional information on the web site: <http://www.euro.who.int/EHindicators> (accessed on 13 January 2003).

the effects of transport on health, namely through air pollution and road traffic injuries. These indicators could be used as a basis to complement the TERM set in order to improve the monitoring of transport-related health effects in relation to transport. In addition, other indicators could be developed to improve the ability to address transport-related health issues (e.g. addressing levels of walking and cycling).

The WHO set of indicators is organized around a variation of the DPSIR model, the so-called DPSEEA framework (Driving Forces, Pressures, Status, Exposures, Effects and Actions). The main difference between the EEA and WHO models is that the WHO approach introduces as a separate category the aspect of exposure, i.e. the concentration of an agent in the environment that comes into contact with the human body<sup>8</sup>. The reason for this difference is that health risks and impacts are closely dependent on exposures to environmental hazards. The definition of a group of indicators of exposure can therefore facilitate the identification of measures targeted at reducing exposures to levels at which adverse effects are unlikely to occur. The following figure illustrates the application of the WHO DPSEEA conceptual framework to the transport sector:



(c) UNECE transport and road safety statistics

The UNECE has developed a database covering transport data (infrastructure, vehicle production, fleet, exports/imports, performance, costs...); employment in the transport sector; air emissions, urban air quality; transport waste and chemical accidents, road salt use; noise

<sup>8</sup> Environmental Epidemiology: a Textbook on Study Methods and Public Health Applications - preliminary edition" Edited by D. Baker, T. Kjellstrom, R. Calderon, H. Pastides (1999) WHO Geneva WHO/SDE/OEH/99.7

exposure; data on national policies and expenditure to abate environment impacts of transportation. In addition, the UNECE runs one of the reference databases for road safety, covering the pan-European region, in addition to Canada and the United States of America.

(d) UNECE environmental monitoring

In preparation for the Environment for Europe Ministerial Conference (Kiev, May 2003), the UNECE supports the preparation by the EEA of the third assessment report, which includes *inter alia* chapters on health and transport, in cooperation with the EEA and the WHO. The UNECE assisted in collecting data from the NIS and other countries not covered by the EEA networks.

(e) OECD reporting system on transport and environment

The OECD has developed a system similar to the TERM one<sup>9</sup>, to assess the integration of environmental concerns into transport policies in its member States.

### **III. KEY CONCLUSIONS OF A WHO REVIEW OF EXISTING SETS OF INDICATORS ON TRANSPORT AND ENVIRONMENT**

Analysis carried out by the WHO, which reviewed EEA TERM and OECD existing sets of indicators to monitor and report on the integration between transport and environment led to the following conclusions:<sup>10</sup>

- Although the focus of the indicators developed by the EEA and the OECD to describe the effects of present transport policies is mostly on environmental end-points, a few indicators provide information also on some health impacts of transport, such as the effects accidents, air pollution and noise.
- Additional efforts, however, are needed to expand the present monitoring and reporting systems to take into account also transport-related health impacts that at the moment are not adequately monitored. Importantly, a large share of these efforts will need to be devoted to develop indicators for health impacts such as those resulting from the decreased amount of physical activity through walking and cycling, and effects related to mental health.
- The lack of adequate data makes it difficult or unreliable the computation of several of the indicators used or proposed by the EEA and OECD sets.
- Differences in the collection and availability of data across different countries limit the geographic coverage of the present monitoring and reporting systems and the possibility of using the indicators for international comparisons and benchmarking, as well as to provide a picture describing the situation at European Region level.

---

<sup>9</sup> OECD: Environment Directorate, Environment Policy Committee – Working Group on the State of Environment “Indicators For The Integration Of Environmental Concerns Into Transport Policies ENV/EPOC/SE(98)1/FINAL, 8 October 1999 (www.oecd.org)

<sup>10</sup> : “Review Of Implementation And Effectiveness Of Existing Policy Instruments On Transport, Environment And Health, And Of Their Potential For Health Gain”, EUR/00/5026094/2

- The statistics routinely collected are centred on motorized road transport. This makes it difficult to analyse and monitor trends in modes of transport, such as walking and cycling, that only very recently have been recognized as "true" transport means, and not merely part of leisure activities.
- There is a need to improve the collection, availability and quality of the basic statistics necessary to compile the indicators describing the health-related impacts of transport, including statistics on non-motorized modes of transport (walking and cycling) and on public transport.

**IV. FURTHER DEVELOPMENT OF INDICATORS TO MONITOR THE INTEGRATION OF ENVIRONMENTAL AND HEALTH ASPECTS INTO TRANSPORT POLICIES, AND THEIR IMPACTS ON HEALTH AND THE ENVIRONMENT , UNDER THE FRAMEWORK OF THE IMPLEMENTATION OF THE TRANSPORT, HEALTH AND ENVIRONMENT PAN-EUROPEAN PROGRAMME (THE PEP)<sup>7</sup>.**

Drawing from the results of the analyses summarized above, the UNECE and WHO secretariat prepared a project proposal to further advance international work for the identification of a set of indicators for submission to the Steering Committee of the Transport, Health and Environment Pan-European Programme (THE PEP) at its first session, 10-11 April 2003.

The proposal aims at taking stock of the work going on at the international level, to further develop the existing sets of indicators to include health aspects, building on the collaboration already existing between the WHO and EEA, as well as to support the establishment of indicators addressing the situation of CIS/NIS, in particular by:

- (a) Establishing a pan-European reporting system on the integration of health and environment aspects into transport policies and on the impacts that these policies have on health and the environment.
- (b) Providing a forum for reporting on the attainment of specific environment and health targets to be set in relation to transport policies.
- (c) Agreeing with member States on the collection of a minimal set of data to improve the coverage of the TERM mechanism, including also indicators related to the health impacts of transport and covering also the NIS countries.

The project will identify indicators, using existing data and work under way, to inform about transport, environment and health links and about progress in achieving environmental and health targets in relation to transport policies. It will also propose a strategy to monitor these links and report trends in the region.

It will be implemented under the overall supervision of THE PEP Steering Committee, and be co-ordinated by the WHO and UNECE secretariat in close partnership with the EEA, and in consultation with member States and other relevant organizations.

The deliverables will include:

(a) A set of indicators for monitoring the relationship between transport, environment and health in the region, which is compatible with and complementary to the work carried out by other organizations;

(b) Reports based the indicators. Such reports will also be made available through the Clearing House on Transport, Environment and Health to be established under THE PEP. It could be issued as part of the TERM reports series, or as a separate report.

The plan of work consists of the following steps, and it is expected to be carried out over a period of 24 months:

(a) Establishment of a Task Force with EEA, OECD, Eurostat, and country experts from research institutes, Governments, other IGOs and NGOs to propose a revised set of indicators, together with a draft monitoring and report strategy;

(b) Discussion and endorsement of the provisional set of indicators and the monitoring and reporting strategy by THE PEP Steering Committee at its second session in April 2004, based on the report prepared by the Task Force;

(c) Feasibility assessment (including pilot testing and identification of sources of necessary data) for those indicators not yet monitored as part of on-going reporting systems, discussed and followed-up by the Bureau to the Steering Committee on the basis of the Task Forces evaluation;

(d) Endorsement by THE PEP Steering Committee of the final set of indicators based on recommendations of the Task Force and outcome of the feasibility assessment;

(e) Preparation a first pan-European indicator-based report of transport, health and environment impacts in the region (month 18-24), and its dissemination through the Clearing House on Transport, Environment and Health and the EEA TERM mechanism.

---