Division 44
Water, Energy and Transport

gtz

Urban Transport and Health

Recommended Reading and Links

August 2010

gtz Transport Policy Advisory Services

commissioned by
Federal Ministry
for Economic Cooperation
and Development

Preface

Transport is a key element of life in the 21st Century, providing us with access to work, school, shopping, social networks and recreation. Transport could take many forms - walking, cycling, and use of motor vehicles or public transport.

Policy-makers are facing increasing pressure to meet the changing mobility needs of citizens in ways which are economically, socially and environmentally sustainable. Additionally, health aspects assume prime influence on transport development policies, as transport affects the health of the whole city's population through its positive and negative impacts on the living environment.

Key negative health impacts from urban transport include injuries from road traffic accidents, noise annoyances and disturbances, respiratory problems due to air pollution and overweight/obesity associated to reduced physical activity as a result of choosing driving instead of walking or cycling. Activities like spending excessive time on the roads being stuck in traffic congestion or travelling in poor road conditions for extended periods have also been known to contribute to large amount of stress and fatigue in human beings, which leads to health problems. Isolation and social exclusion as a result of the inability to access transport and lack of transport access for health care services could also be classified as negative health related transport impacts. The major vulnerable groups in a typical urban setting would usually include children, the elderly, the disabled (in cases where transport systems are not designed to cater to their needs), cyclists and pedestrians. In reality, anyone who is not in a closed vehicle and shares road space with traffic is vulnerable. This includes non-road users like hawkers, vendors and traffic policemen on and along the roads.

The promotion of healthy and sustainable transport systems and alternatives could prevent the negative effects of transport patterns on human health. In order to achieve this, cooperation among sectors and high-level political commitments are crucial to ensure that health issues are considered when transport policies are formulated.

Western countries and especially developing countries face conflicting demands when making transport policies. While transport plays a key role in a country's economic growth and development, concerns regarding social sustainability of transport policies, and how they can harm human health and the environment tend to get side tracked.

This reading list on "Transport and Health" prepared by GTZ, provides firstly, an overview of key organisations and development goals relating to transport and health. It then discusses impacts of conventional road transport activities on people's health and discusses the possibilities of moving to more sustainable and healthy transport modes. The structure of the reading list is organized as follows:

- Key organisations in the field
- Transport as access to health services
- Air pollution, noise and congestion
- Greenhouse gas (GHG) emissions and climate change

- Road traffic safety and protection against accidents
- Health benefits of public transit, walking and cycling

For more information on our work, please see the last page of this document and visit our web page: www.sutp.org

Key Organisations in the Field

International Health Organizations are usually divided into three groups: multilateral organizations, bilateral organizations, and non-governmental organizations. This reading list focusses on organizations that are active with respect to the interlinkages between transport and health.

World Health Organization (WHO) (Regional Office for Europe)
http://www.euro.who.int/en/what-we-do/health-topics/environmental-health/Transport-and-health

WHO is the authority responsible for public health in the United Nations framework of organizations. The Organization identified the following as health issues in the transport sector in its 1999 “Charter on Transport, Environment and Health”:

- traffic crashes are a major cause of death and serious injuries
- road transport is a major contributor to human exposure to air pollution
- increasing exposure to levels of traffic noise can damage hearing permanently
- physically active forms of transport offer significant positive health effects
- heavy road traffic can divide communities and reduce social support
- vulnerable groups are effected by traffic – particularly people with disabilities, older people, children and young people, and people living and working in areas of high pollution and noise
- traffic crashes can have devastating impact on low-income households and can contribute to poverty

WHO/Europe’s work contributes to achieving the goals of the WHO European process on environment and health and of the Transport, Health and Environment Pan-European Program (THE PEP).

The following links provide direct access to the work of the WHO Regional Office for Europe.

Facts and Figures
http://www.euro.who.int/en/what-we-do/health-topics/environmental-health/Transport-and-health/facts-and-fiigures

Publications
http://www.euro.who.int/en/what-we-do/health-topics/environmental-health/Transport-and-health/publications

Health and Environment Linkages Initiative (HELI)
http://www.who.int/heli/en/

HELI is a global effort by WHO and UNEP to support action by developing country policymakers on environmental threats to health. HELI encourages countries to address health and environment linkages as integral to economic development. It supports valuation of ecosystem 'services' to human health and well-being – services ranging from climate regulation to provision/ replenishment of air, water, food and

energy sources and generally healthy living and working environments. HELI activities include country-level pilot projects and refinement of assessment tools to support decision-making.

Links to current HELI pilot projects:

Jordan: water is life

Thailand: healthy agriculture

Uganda: a herding tradition and modern livestock development

Health Effects Institute (HEI)
http://www.healtheffects.org

HEI is a nonprofit corporation established in 1980 as an independent research organization to provide high-quality, impartial, and relevant science on the health effects of air pollution. Other public and private organizations periodically support special projects or certain research programs.
To accomplish its mission, HEI

- Identifies the highest priority areas for health effects research;
- Funds and oversees the conduct of research projects;
- Provides intensive independent review of HEI-supported and related research;
- Integrates HEI's research results with those of other institutions into broader evaluations; and
- Communicates the results of HEI research and analyses to public and private decision makers.

International Association of National Public Health Institutes (IANPHI)
http://www.ianphi.org/

The IANPHI – is a global initiative that aims to develop stronger and more coordinated public health systems through the development and support of national public health institutes (NPHIs). IANPHI is also a professional association for NPHI directors, providing a platform for advocacy and collective action in addressing public health challenges and opportunities. IANPHI has more than 60 members and is funding NPHI development projects in more than 25 countries.

Pan American Health Organization (PAHO)
http://new.paho.org/hq/

The Pan American Health Organization (PAHO) is an international public health agency with more than 100 years of experience in working on improving the health and living standards of the countries of the Americas. It serves as the specialized organization for health of the Inter-American System. It also serves as the Regional Office for the Americas of the World Health Organization and enjoys international recognition as part of the United Nations system.

The Global Road Safety Partnership (GRSP)
http://www.grsproadsafety.org/

The GRSP brings together governments and governmental agencies, the private sector and civil society organizations to address road safety issues in low and middle income countries. GRSP is a hosted program of the International Federation of Red Cross and Red Crescent Societies (IFRC), based in Geneva.

Traditionally, road accidents have been seen as an unfortunate consequence of a transport system and as a problem for the transport sector. However, the direct costs of the growing number of crashes falls mostly on the health sector, businesses and families. Today it is widely acknowledged that many sectors have a role to play in road safety, especially in the prevention of crashes, deaths and injuries. GRSP brings together these sectors at the global, national and sometimes local government level. GRSP provides advice on good practices and facilitates projects in a growing number of countries.

Transport and Health Study Group (THSG)
http://www.stockporthealth.nwest.nhs.uk/thsg/

The THSG is an independent scientific society set up to study the links between transport and health and to promote a healthy transport system. It is predominantly a UK body but is at an early stage of expanding into a European body.

Transport, Health and Environment – Pan-European Program (PEP)
http://www.unece.org/thepep/en/welcome.htm

The PEP, established in 2002, aims to bring together key players from these sectors and make their integration a reality. THE PEP pools capacities and skills from Europe, Caucasus, Central Asia and North America, linking regional and grassroots players. It offers a platform for countries to share information and know-how and benefit from each others' experience. By integrating transport, health and environment policies, THE PEP contributes to a greener economy, safeguarding health and the environment.

The Transport and Health Group
http://www.lshtm.ac.uk/

http://www.lshtm.ac.uk/nphiru/research/transportandhealthgroup/transportandhealthgroup.pdf

The Transport and Health Group is a multi-disciplinary team of academics at London School of Hygiene and Tropical Medicine (LSHTM) with research interests in the public health impacts of transport.

Other General Players in the Field

Bicycling Empowerment Network (BEN)
http://www.benbikes.org.za/index.htm

The mission of BEN is poverty alleviation through the promotion of the use of the bicycle in all of its forms, in order to enhance low-cost non-motorised transport, and improve health through linking exercise and mobility. In collaboration with local and international partners, BEN facilitates the transportation of bicycles from Europe, the Americas and Asia to Southern Africa; the establishment of bicycle workshop projects; distribution of these bicycles to strategically selected groups of recipients; and the planning and introduction of bicycle user paths and integrated linking networks.

Clean Air Initiative (CAI)
http://www.cleanairnet.org/cai/1403/channel.html

The CAI advances innovative ways to improve air quality in cities by sharing knowledge and experiences through partnerships in selected regions of the world.

The following internet portals are efforts of the CAI for cities in different regions. They provide data, new information, cross-cutting expertise and regional networks for the exchange of experience in urban development, transport, energy reform, environmental management and environmental health.

CAI-Asian Center:
http://www.cleanairnet.org/caiasia/1412/channel.html

Latin America:
http://www.cleanairnet.org/lac/1471/channel.html

Sub-Saharan Africa:
http://www.cleanairnet.org/ssa/1414/channel.html

European Transport Safety Council (ETSC)
http://www.etsc.eu/home.php

http://www.etsc.eu/documents/Safety%20Monitor%20_%20July%202010.pdf

ETSC is a Brussels-based independent non-profit organization dedicated to the reduction of the number and severity of transport crash injuries in Europe. Its latest publication *"Safety Monitor 81, July 2010 – ambitious target, weak program"* focuses on the EU Road Safety Program 2011-2020.

ETSC welcomes the adoption of new EU Road Safety Policy Orientations 2011-2020 with the target to reduce road deaths by 50% by 2020 and the new emphasis on

serious injuries. The goal is ambitious but the measures announced by the European Commission call seriously into question the chances of achieving it.

Institute for Transportation and Development Policy (ITDP)
http://www.itdp.org/

The ITDP is a leading organization in the promotion of environmentally sustainable and equitable transportation policies and projects worldwide.

An example for good practice in healthcare projects in the transport sector is the ITDP contribution to "Facts and Main Findings from the ITDP Healthcare Projects in Africa 2003 - 2007". The report contains experiences gained in 4 pilot projects in Ghana, Senegal, South Africa and Uganda concerning mobility and access to healthcare.
http://www.itdp-europe.org/assets/documents/Healthcare_and_Transport_in_Africa.pdf

Institute of Public Health in Ireland
http://www.publichealth.ie/

The Institute of Public Health in Ireland (IPH) promotes cooperation for public health between Northern Ireland and the Republic of Ireland by

strengthening public health intelligence;
building public health capacity;
policy and programme development and evaluation.

National Health Committee (NHC) New Zeeland
http://www.nhc.health.govt.nz/

The National Health Committee (NHC) provides the New Zealand Minister of Health with independent advice on a broad spectrum of health and disability issues. The NHC incorporates the Public Health Advisory Committee, which provides the Minister with public health advice. On this website you can find out more under about us, including the work programme, news, media releases and NHC publications available for download.

Transport as Access to Health Services

Transport is essential for human health, because it provides necessary access to other social infrastructure and services such as health care. In developing countries, many (usually poor) households don't have access to reliable transport services. Development policy must focus on the weaknesses of transport access for health.

Babinard et al. (2006): **Maternal and Child Mortality Development Goals: What Can the Transport Sector Do?**
http://siteresources.worldbank.org/INTTSR/Resources/tp12_main_text_maternal_health.pdf

The reduction of child mortality and the improvement of maternal health are two of the Millennium Development Goals (MDGs) of the United Nations. This paper focuses on the ways in which transport and road infrastructure play key roles in the overall delivery of and access to health services, and in the effectiveness of the health referral process. Many households do not have the reliable, suitable, and affordable transport services that are essential for access to care during the critical prenatal and neonatal periods. Emergency access to healthcare is also critical because many childbirth-related complications are unpredictable and the majority of births in developing countries continue to take place at home.

Bicycling Empowerment Network Namibia (BEN Namibia), AIDS Low Unit/Legal Assistance Centre (ALU/LAC) and International Community of Women Living with HIV/AIDS (ICW-Namibia) (2008): **Impact of transport on access to health services for PLWHA in Namibia**
http://www.ifrtd.org/en/full.php?id=263

Transport has a crucial role to play in increasing Namibian communities' access to health services, particularly for people living with HIV/AIDS (PLWHA).

This research conducted by the Bicycling Empowerment Network Namibia in partnership with the International Community of Women Living With HIV/AIDS and the AIDS Law Unit from the Legal Assistance Centre, from August to October 2007, demonstrated that there is strong need for intersectoral initiatives to provide appropriate and affordable transport solutions to patients and health workers in the country.

British Medical Journal (BMJ) (1999): **A Different Route to Health: Implications of Transport Policies**
http://www.bmj.com/cgi/content/extract/318/7199/1686

Travel—how, where, and how often we do it—has major implications for the health of individuals and of the population. Transport activities impact on health, both negatively and positively; and transport policies are now a key determinant of health. Health has to be included on the transport policy agenda if gains are to be achieved, and health professionals have a key role in this.

In this article on the implications of transport policies, the author draws on an extensive review to which many experts contributed and which will soon be published as a book by the World Health Organization. The author also draws on the preparatory work for the Charter on Transport, Environment, and Health which was adopted at the Ministerial Conference on Environment and Health held in London.

British Medical Journal (BMJ) (2000): **Health Impact Assessment**
http://www.bmj.com/cgi/content/extract/320/7246/1395?ijkey=f8b45c3e0a1941be36d342aa62a2b844cc54bddd&keytype2=tf_ipsecsha

Health impact assessment is a means of evidence based policy making for improvement in health. It is a combination of methods whose aim is to assess the health consequences of a population of a policy, project, or program that does not necessarily have health as its primary objective.

Health impact assessment is a multidisciplinary process within which a range of evidence about the health effects of a proposal is considered in a structured framework. It takes into account the opinions and expectations of those who may be affected by a proposed policy.

European Agency for Safety and Health at Work (2010): **E-fact 47: Health Promotion in the Transport Sector**
http://osha.europa.eu/en/publications/e-facts

Promoting health at the workplace requires a holistic approach. Any initiatives should consider the worker's personal life, their working life, and the interaction between the two. Working conditions are known to influence the general health of workers; for example, sedentary work can contribute to obesity. Similarly, workers' personal habits, attitudes and lifestyle choices affect their health and wellbeing, and also can have an impact on their work performance**.**

Institute for Transportation and Development Policy (ITDP): **Summary on the FABIO/BSPW - Bicycle Ambulance Project (Uganda)**
http://ifrtd.gn.apc.org/mobilityandhealth/ed/uploads/Bikeambulancesarticle.pdf

During the period between January and December 2001, 100 ambulance-trailers were assembled by the BSPW (Bicycle Sponsorship Project & Workshop) for the FABIO Bicycle Ambulance Project. The bicycles in combination with their specially built trailers, financed through donations were distributed in Kabale, Bugiri and Soroti District has recorded good results. It's only limitation is the high cost of production of the bicycle ambulances.

Though no statistical figures were presented, the bicycle ambulance project was found to contribute to the reduction of infant and maternal mortality in peri-urban and rural Uganda. It provided the only affordable and appropriate transport – system for patients of low income households.

Institute for Transportation and Development Policy (ITDP) (2008): **Healthcare & Transport in Africa**
http://www.itdp-europe.org/assets/documents/Healthcare_and_Transport_in_Africa.pdf

This article is an evaluation of four pilot projects in Ghana, Senegal, South Africa and Uganda taken up by the Institute for Transportation and Development Policy (ITDP) offices based in the USA and Europe. The purpose of the evaluation is to promote healthcare access in the target countries. Further examples are given from Tanzania and Niger to illustrate the conditions of the transport system in Africa.

Hook et al. (2005): **Urban Transport and the Millennium Development Goals**
http://siteresources.worldbank.org/INTTSR/Resources/Hook_MDG_and_Transport_Article_final_nov05_no_pictures.pdf

The United Nations Millennium Development Goals (MDGs) are eight goals that all 191 UN member states have agreed to try and achieve by the year 2015. The MDGs do not include any specific goals or targets related to transport, though transport sector interventions are critical to meeting many of the goals. The lack of inclusion of concrete targets for transport in the Millennium Development Goals carries with it two risks: 1) that critical transport sector interventions will get left off the development agenda entirely, and 2) that the lack of specific targets will give wide latitude to donor agencies and governments to intervene in the sector without any clear guidance from the MDGs, leading to unspecific interventions that do little to reduce poverty or perhaps even make it worse.

This article is an effort to set clearer targets and goals for transport interventions that will help meet the Millennium Development Goals. It is focused on urban transport interventions, but similar goals should also be set for rural transport.

National Health Service, GB (NHS) (2005): **Improving Health through Transport**
http://www.healthandtransportgroup.co.uk/articles/makingcase_health_transport.pdf

It is clear that transport and health are inextricably linked. Transport has major health impacts – through accidents, levels of physical activity undertaken, effects on air pollution, and access to a range of services. The organization of health services can add to or alleviate all these impacts, as well as make it more or less difficult for people to travel to and between healthcare settings. The provision of transport services (including issues such as car parking) have major cost implications, as does addressing the health issues associated with transport.

This document sets out broadly:

• Impacts of transport: physical activity, injuries, air pollution, access to services, social networks and community severance, health inequalities, economic costs

• Policy drivers

• Taking action: introducing patient and staff travel plans, implementing a physical activity strategy, contributing resources/support to local transport programmes, contributing to local accessibility planning, assessing the health impact of local transport plans/schemes

New South Wales (NSW, Australia) Department of Health: **Transport for Health**
http://www.health.nsw.gov.au/initiatives/iptaas/index.asp

The initiative Transport for Health provides a range of transport and travel assistance to people who cannot use or have difficulty using public and/or private transport or who are disadvantaged by distance. It integrates all non-emergency health related transport assistance programs into a single multifaceted transport assistance program in each Area Health Service.

Transport for Health includes the Isolated Patients Travel and Accommodation Assistance Scheme (IPTAAS), the Statewide Infant Screening-Hearing (SWISH) Travel program, the Health Related Transport Program, inter-facility transport schemes and the former Transport for Health program.

Social Development Department / The World Bank (2006): **Social Analysis in Transport Projects: Guidelines for Incorporating Social Dimensions into Bank-Supported Projects**
http://siteresources.worldbank.org/EXTTSR/Resources/SA_Transport_wb.pdf

Effective transport systems are an integral part of a good quality of life, enabling people to access resources, jobs, health care, pursue an education, and to market food, goods and services. At their best, transport projects can provide access and employment opportunities to communities and the private sector, provide a platform for widespread stakeholder consultation and participation in decision making, promote integrated development planning and ultimately, improved social development and economic growth.

This document helps to maximize the opportunities for positive outcomes and also helps to reduce or mitigate the risks and negative impacts of construction activity, institutional changes and policy reforms. It is also expected to be of use to governments, civil society and other stakeholders in considering how best to integrate social issues in their development efforts.

South African Health Review (2002): **Transport for Health Care Delivery**
http://siteresources.worldbank.org/INTTSR/Resources/SASR2002REview_chapter18.pdf

The lack of transport to ensure timely transfer of patients between levels of health care and for delivery of medicines, vaccines, and other essential equipment is a commonly heard woe of health workers, particularly from those working in rural areas, but is often overlooked and rarely researched.

This article explores some of the complexities of the present transport management systems for health service delivery within the public sector through three provincial case studies, namely Limpopo, Mpumalanga and Gauteng. Some recommendations for improved management and for further research are made.

The World Bank: **Transport Strategy to Improve Accessibility in Developing Countries**
http://siteresources.worldbank.org/INTTSR/Resources/accessibility-strategy.pdf

This paper outlines guidance for addressing the access and mobility needs of disabled and elderly people in the context of the World Bank's mission to reduce poverty and discusses the main challenges for providing inclusive transport. It draws attention to opportunities to learn from transport interventions and to current research and describes the main activities fostered by the Transport sector in the World Bank.

United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) (2005): **Health without Borders: The Background**
http://www.unescap.org/esid/hds/pubs/2442/2_TheBackground.pdf

When UNESCAP's Health and Development Section of the Emerging Social Issues Division and the Transport Facilitation Section of the Transport and Tourism Division, embarked on the '*Health Without Borders'* project at the beginning of 2005, the objective was to find sustainable solutions to improve the health of truck drivers in the GMS. The inter-divisional collaboration was meant to address the health and transport dimensions of the problem equally.

A key activity of the project was to undertake a deeper analysis of working conditions and health behavior along selected transport corridor(s) as a basis for planning better interventions. Based on this analysis, at least one health stop was to be piloted in partnership with existing health facilities for transport workers. The research findings, the lessons learned from the pilot interventions and policy recommendations to address the underlying concerns would then be disseminated to all stakeholders. The project also aimed to mobilize stakeholders, including the transport workers themselves, transport enterprises, relevant ministries and government agencies, as well as local and international NGOs to work more closely to address the health concerns of long-distance road transport workers which have significant public health implications.

World Health Organization (WHO) (2009): **Sustainable and Healthy Transport Can Help Boost Economies**
http://www.euro.who.int/en/what-we-publish/information-for-the-media/sections/press-releases/2009/01/sustainable-and-healthy-transport-can-help-boost-economies

At the High-level Meeting on Transport, Health and Environment in Amsterdam, the Netherlands, policy-makers from ministries of transport, health and the environment across Europe are examining how innovative transport policies can create employment and economic opportunities for a healthier society.

Studies show that investment in healthy and environmentally friendly transport – including clean and efficient public transport systems and transport infrastructure – can help reduce congestion, road traffic accidents and pollution, thereby contributing

to healthier societies, sustainable mobility and wealth, and combating climate change.

World Health Organization (WHO): **Health Impact Assessment**
http://www.who.int/hia/en/

Economic sectors such as transport, agriculture and housing have profound impacts on health. For instance, transport is a major factor in traffic injuries, air pollution and noise. But "healthy transport policies" can help reduce these risks, and so can promoting walking and cycling. In agriculture, fertilizers and pesticides may boost crop yields. But their wise usage is important to protect farm workers and consumers from excessive chemical exposure. Health Impact Assessment (HIA) is a means of assessing the health impacts of policies, plans and projects in diverse economic sectors using quantitative, qualitative and participatory techniques.

Air Pollution, Noise and Congestion

Road Transport is the main source of air and noise pollution in urban areas. Increased congestion in developing cities contributes more and more to such pollution. Furthermore, traffic crashes caused by vehicles threatens the lives and health of city residents.

Clark et al. (2007): **The Effect of Transportation Noise on Health and Cognitive Development: A Review of Recent Evidence**
http://escholarship.org/uc/item/8434889m

This narrative review evaluates recent studies of aircraft and road traffic noise that have advanced or synthesized knowledge about several aspects of adult and child health and cognition. Studies have demonstrated a moderate effect of transport noise on hypertension, cardiovascular disease and catecholamine secretion: there is also evidence for an impact on psychological symptoms but not for the onset of more serious clinically defined psychiatric disorders. In conclusion, noise is a main cause of environmental annoyance and it negatively affects the quality of life of a large proportion of the population.

Clean Air Initiative (CAI) (2008): **Air Pollution Blamed as Study Finds Respiratory Illness Hitting HCMC's Children**
http://www.cleanairnet.org/caiasia/1412/article-72487.html

Respiratory illness continues to be a major health concern for young children in Ho Chi Minh City. According to a survey of 1,000 households in the city, more than 90% of children under 5 were found to be suffering from respiratory illness in the past year. Many of these illnesses become severe enough to result in hospitalization; more than 28,000 children under five years of age were admitted to HCMC's children's hospitals for acute lower respiratory infections (ALRI) from 2003 to 2005.

European Environment Agency (EEA) (2009): **Transport at a Crossroads. TERM 2008: Indicators Tracking Transport and Environment in the European Union**
http://www.eea.europa.eu/publications/transport-at-a-crossroads/at_download/file

The recent economic downturn may lessen the demand for transport but the transport sector still contributes significantly to rising emissions of greenhouse gases, noise exposure, air pollution, fragmentation of habitats and impacts on wildlife. The Transport and Environment Reporting Mechanism (TERM) report for 2008 highlights this trend. Although there is growing awareness of the transport sector's disproportionate impact on the environment, the report shows that there is little evidence of improved performance or a shift to sustainable transport across Europe.

Health Effects Institute (HEI) (2010): **Traffic-Related Air Pollution: A Critical Review of the Literature on Emissions, Exposure, and Health Effects**
http://pubs.healtheffects.org/view.php?id=334

This Special Report of the Institute's Panel on the *Health Effects of Traffic-Related Air Pollution* is the most comprehensive and systematic review to date of the scientific literature on emissions, exposure, and health effects from traffic-related air pollution. It includes results on the populations exposed around major roads, the associations between exposure to air pollution from traffic and human health, and important remaining data gaps. Compared with the initial pre-print version released in May 2009, this final version has undergone data verification and editorial changes; however, the overall conclusions did not change.

Kjellstrom et al. (2003): **Comparative Assessment of Transport Risks – How It Can Contribute to Health Impact Assessment of Transport Policies**
http://siteresources.worldbank.org/INTTSR/Resources/HIA_kjellstrom.pdf

Health impact assessment (HIA) and comparative risk assessment (CRA) have been lauded as useful tools to bring research into policy- and decision-making. To date, little systematic investigation has been made of how CRA can contribute to HIA. Both tools have considerable potential to address the complex issues of health risks and impacts of transport policies and planning activities and to incorporate transport choices as a part of the complex picture of what constitutes a healthy society. As yet, however, they have not been applied widely to transport decisions.

This study draws on the limited application of these tools in the context of road transport to illustrate the potential benefits that comparative assessment of transport risks could bring to HIAs of transport policies.

Transport & Environment (TE) (2010): **Transport Noise and Health**
http://www.transportenvironment.org/module-htmlpages-display-pid-16.html

Noise is increasingly recognized as a serious health hazard as well as a nuisance. The WHO recognizes community noise, including traffic noise, as a serious public health problem. This article outlines the various health effects of noise and provides

links to further information. The effects must be considered in the European context where half of citizens live in noisy surroundings, and a third experiences levels of night time noise that disturb sleep.

Transport, Health and Environment Pan-European Program (THE PEP) (2009): **Economic Valuation of Transport-Related Health Effects: Summary**
http://www.euro.who.int/__data/assets/pdf_file/0004/87484/PEP_EconValSum.pdf

The adverse health effects of road transport result from air and noise pollution, road crashes and deterrent effects on walking and cycling as well as from less obvious effects such as social isolation and reduced quality of life in neighborhoods affected by heavy road traffic. The topics discussed in this report in more detail included road noise, transport-related air pollution, road safety and insufficient physical activity related to transport that hinders commuter cycling and walking.

The main objective of this project was to develop a practical approach to the economic valuation of transport-related health effects, including a focus on children. The project draws on state-of-the- art understanding of the links between transport and health and on a review of how various economic studies have addressed the issue of valuating transport-related health effects.

United Nations Economic Commission for Europe (UNECE) (2008): **The Pan-European Program on Transport, Health and Environment: Assessment and Progress Made**
http://www.unece.org/thepep/en/publications/THEPEP.assessment.en.pdf

This report assesses the effectiveness of THE PEP in improving communication, cooperation and collaboration among the three sectors (transport, health, and environment) and its impact on the development of intersectoral policies and strategies in Member States with regard to the integration of environmental and health concerns into transport policy. The report also assesses the institutional set-up of THE PEP and its secretariat and makes recommendations for improvement.

United Nations Economic Commission for Europe (UNECE) (2008): **Transport, Health and Environment: Trends and Developments in the UNECE-WHO European Region (1997-2007)**
http://www.unece.org/thepep/en/publications/THE.trends.en.pdf

This report reviews developments and progress in transport, health and environment since 1997. While transportation is an integral part of economic and social development and is essential to the functioning of all societies, the report shows that current patterns of transport and travel are not sustainable with increasing pressures, in particular on urban areas. These include the negative effects on health and ecosystems of transport-related air pollution and noise, greenhouse gas (GHG) emissions, congestion, road traffic accidents and other effects.

World Health Organization (WHO) (2000): **Transport, Environment and Health**
http://siteresources.worldbank.org/INTTSR/Resources/Transport_health&environment.pdf

Transport facilitates access to jobs, education, markets, leisure and other services, and has a key role in the economy. On the other hand, concern is mounting about the detrimental impact on the environment of current transport policies, and many people question the policies' social sustainability.

A major purpose of this book is to alert policy analysts, decision-makers and politicians to current knowledge about the health effects of transport and the means to reduce them. It summarizes the latest scientific evidence on the impact of transport-induced air pollution, noise and accidents on physical health, barrier effects (changes in behaviour in reaction to transport risks) and effects on mental health. This book highlights the considerable potential health benefits from non-motorized forms of transport.

World Health Organization (WHO) (2004): **Outdoor Air Pollution: Assessing the Environmental Burden of Disease at National and Local Levels**
http://www.who.int/quantifying_ehimpacts/publications/ebd5.pdf

This guide outlines a method for estimating the disease burden associated with environmental exposure to outdoor air pollution. In a recent estimate of the global burden of disease (GBD), outdoor air pollution was estimated to account for approximately 1.4% of total mortality, 0.4% of all disability-adjusted life years (DALYs), and 2% of all cardiopulmonary diseases. To obtain estimates of the impact of outdoor air pollution, population exposures are based on current concentrations of particulate matter (PM) measured as either PM10 or PM2.5.

World Health Organization (WHO) (2004): **Health Aspects of Air Pollution: Results from the WHO Project "Systematic Review of Health Aspects of Air Pollution in Europe"**
http://www.euro.who.int/__data/assets/pdf_file/0003/74730/E83080.pdf

This report summarizes the most recent information on the health effects of air pollution. It is based on the results of a comprehensive review of scientific evidence organized by the World Health Organization in support of air pollution policy development in Europe, and in particular the European Commission's Clean Air for Europe (CAFE) program. The review indicates that air pollution at current levels still poses a considerable burden on health in Europe. Many different adverse effects have been linked to exposure to air pollution, including an increased risk of cardiopulmonary disease and a reduction in life expectancy of a year or more for people living in European cities. Some of these effects occur at very low concentrations that were previously considered safe. Taken together, the evidence is sufficient to strongly recommend further policy action to reduce levels of air pollutants, including particulates, nitrogen dioxide and ozone. It is reasonable to assume that a reduction in air pollution will lead to considerable health benefits.

World Health Organization (WHO) (2009): **Amsterdam Declaration. Making The Link: Transport Choices for Our Health, Environment and Prosperity**
http://www.euro.who.int/__data/assets/pdf_file/0019/86500/E92356.pdf

The Amsterdam Declaration commits to adopting integrated policies to:

- contribute to sustainable economic development and stimulate job creation through investment in environment- and health-friendly transport;
- manage sustainable mobility and promote a more efficient transport system;
- reduce emissions of transport-related greenhouse gases, air pollutants and noise;
- promote policies and actions conductive to healthy and safe modes of transport.

World Health Organization (WHO) and World Bank (WB) (2004): **World Report on Road Traffic Injury Prevention**
http://www.who.int/violence_injury_prevention/publications/road_traffic/world_report/en/index.html

Road traffic injuries are a major but neglected public health challenge that requires concerted efforts for effective and sustainable prevention. Of all the systems with which people have to deal every day, road traffic systems are the most complex and the most dangerous. Worldwide, an estimated 1.2 million people are killed in road crashes each year and as many as 50 million are injured. Projections indicate that these figures will increase by about 65% over the next 20 years unless there is new commitment to prevention. Nevertheless, the tragedy behind these figures attracts less mass media attention than other, less frequent types of tragedies.

This report is the first major report jointly issued by the World Health Organization (WHO) and the World Bank on this subject. It underscores their concern that unsafe road traffic systems are seriously harming global public health and development. It contends that the present day levels of road traffic injury are unacceptable and avoidable.

Greenhouse Gas (GHG) Emissions and Climate Change

There is strong evidence that most of the global warming of the past 50 years is due to human activity. Motorized transport is a major contributor to climate change as it produces emissions from the combustion of fossil fuel, particularly carbon dioxide.

Potential implications for human health arising from climate change include increased mortality from extremes of temperature, increased rates of waterborne diseases due to flooding, higher rates of skin cancers due to ozone layer depletion, and increased vector-borne diseases such as dengue fever.

This section provides the understanding of how transport can influence the global climate change and its implication for human health.

Bridging the Gap: Pathways for Transport in a Post 2012 Process
http://www.transport2012.org

Transport is a major greenhouse gas (GHG) emitting sector (13 percent of global GHG emissions) and its importance will increase in the next years.

The initiative "Bridging the Gap: Pathways for Transport in a Post 2012 process" is comprised of GTZ, TRL, Veolia Transport and UITP. The initiative was formed at COP14 in Poznan to encourage international recognition that land transport should play a more important role addressing climate change in the post 2012 agreement and to bridge the gap between this sector and climate policy.

Doctors for the Environment Australia (DEA) (2007): **Public Transport, Health and Climate Change – A DEA Initiative**
http://www.dea.org.au/node/183

“Doctors for the Environment Australia” is involved in a national initiative to promote public transport and seeking recognition that public transport could address the climate change and a health issue.

This article points out that in Australian cities the largest contributor to transport greenhouse emissions is the private car and the government can help ease this growth with better public transport. At the same time the use of the private car carries significant responsibility for the epidemic of obesity and other life style diseases, and its pollutants increase the burden of heart and respiratory disease amongst the 70 per cent of the Australian public who live in urban communities.

European Environment Agency (EEA) (2010): **Towards a Resource-Efficient Transport System — TERM 2009: Indicators Tracking Transport and Environment in the European Union**
http://www.eea.europa.eu/publications/towards-a-resource-efficient-transport-system/at_download/file

The objective of this report is to indicate some of the main challenges for reducing the environmental impacts of transport and to make suggestions to improve the environmental performance of the transport system as a whole. The report examines issues centred around transport and climate change, which need to be addressed in the coming years. In this report, electric vehicles are widely predicted to be one of the most effective measures to reduce CO_2 emissions. The 'improved' package anticipates an uptake rate of 50–80 % in 2050. A 35 % reduction in CO_2 for electric cars by 2050 is projected on the basis of a mix of renewable and non-renewable energy sources.

German Technical Cooperation (GTZ) (ed.) (2007): **The CDM in the Transport Sector**. A Sourcebook for Policy-maker in Developing Cities, Module 5d
http://www.sutp.org/dn.php?file=5D-CDM-EN.pdf

Since the advent of Kyoto Protocol in 2005, many countries, both developed and developing, have embraced the concept of Clean Development Mechanism (CDM) in order to reduce their carbon emissions. CDM, an innovative strategy introduced by the Kyoto Protocol, is related to projects in developing countries which are targeted at reducing GHGs, which can be then sold to countries mostly in the developed world. This module discusses the viability of sustainable transport projects to be qualified under the CDM mechanism which will thereby benefit from GHG offset sales. The module also presents a case study on Bogotá's BRT system TransMilenio, the first officially registered CDM project for transport.

German Technical Cooperation (GTZ) (ed.) (2007): **Transport and Climate Change**. A Sourcebook for Policy-maker in Developing Cities, Module 5e
http://www.sutp.org/dn.php?file=5E-TCC-EN.pdf

This module of the sourcebook for policy-maker in developing cities edited by GTZ summarizes the challenges that climate change mitigation has to face in the transport sector and presents the major options and instruments to deal with them. The module is a comprehensive summary of sustainable transport policy options and sketches out their potential for the reduction of carbon dioxide emissions. The module draws on the existing sourcebook modules and thus offers both a comprehensive overview and a thematic entry point to the whole sourcebook. To ease access to more detailed information, the module includes many references to the other sourcebook modules.

German Technical Cooperation (GTZ) (ed.) (2009): **Adapting Urban Transport to Climate Change**. A Sourcebook for Policy-maker in Developing Cities, Module 5f
http://www.sutp.org/dn.php?file=5F-ACC-EN.pdf

Many transport decision-makers in developing countries are already confronted with extreme weather events, such as flooding, subsidence and storms, all of which are expected to increase with climate change. In the worst case, transportation systems may not be able to recover between such events, resulting in exponential damages. This module of the GTZ Sourcebook for Decision-Makers in Developing Cities is intended to raise awareness and describes the expected impacts of climate change on urban passenger transport as well as possible adaptation measures.

Natural Resources Canada (2009): **Links between Fuel Consumption, Climate Change, Our Environment and Health**
http://oee.nrcan.gc.ca/transportation/idling/health.cfm?attr=8

The transportation sector is responsible for 27 percent of greenhouse gas (GHG) emissions in Canada. Light-duty vehicles – the cars, vans and light-duty trucks are responsible for almost half of that total. While automakers have been successful in reducing criteria air contaminant (CAC) emissions from cars and light trucks, fuel usage and carbon dioxide (CO2) emissions have grown steadily over the past two decades. That's because CO2 – the principle GHG linked to climate change – is an

unavoidable by-product of the burning of fossil fuels. Although light-duty vehicles are more fuel efficient than they were in the 1970's, there are many more vehicles on the road today, and we're driving them further than before, thus using more fuel. While much of the energy use in Canada is necessary, there are times when we could use energy more wisely.

This article describes one of the easiest actions that Canadians can take – with a simple turn of a key – is to avoid unnecessary idling. Idling is not only a waste of energy and money; it is also a source of greenhouse gas emissions.

Woodcock et al. (2009): **Public Health Benefits of Strategies to Reduce Greenhouse-Gas Emissions: Urban Land Transport**
http://www.thelancetglobalhealthnetwork.com/wp-content/uploads/Health-and-Climate-Change-2.pdf

This paper concludes the following key messages:

- Transport-related greenhouse-gas emissions are increasing, with a rapid growth projection in low-income and middle-income countries.
- Production of lower-emission motor vehicles (cars, motorcycles, and trucks) and reduction in travel by motor vehicles are needed to meet targets for reduction of greenhouse-gas emissions.
- Lower-emission motor vehicles would reduce the health burden from urban outdoor air pollution, but a reduction in the distance travelled by motor vehicles could have a greater effect.
- Increase in the distances walked and cycled would also lead to large health benefits. Largest health gains would be from reductions in the prevalence of ischemic heart disease, cerebrovascular disease, depression, dementia, and diabetes.
- Although reducing motor vehicle use would decrease the injury risk for existing pedestrians and cyclists, if many more people walked and cycled there might be an increase in the number of pedestrian and cycle injuries, since more people would be exposed to the remaining risk.
- Creation of safe urban environments for mass active travel will require prioritization of the needs of pedestrians and cyclists over those of motorists. Walking or cycling should become the most direct, convenient, and pleasant option for most urban trips.

World Health Organization (WHO) (2007): **Global Climate Change: Implications for International Public Health Policy**
http://www.who.int/bulletin/volumes/85/3/06-039503/en/

The evidence for anthropogenic climate change is now clear and convincing. The earth's surface has warmed by more than 0.8 °C over the past century, and by approximately 0.6 °C in the past three decades. This warming has been linked to more extreme weather conditions such as intense floods and droughts, heavier and more frequent storms, and a possible increase in frequency and intensity of the El Niño Southern Oscillation. These changes are largely caused by human activities-

mainly burning of fossil fuels releasing carbon dioxide (CO2) that traps heat within the atmosphere.

This article points out that human-induced climate change is an emerging threat that rightly commands widespread policy and public attention. Along with other rapid changes associated with global population and economic growth, climate change strains existing weak points in health protection systems and calls for reconsideration of public health priorities.

World Health Organization (WHO) (2008): **Protecting Health from Climate Change**
http://www.euro.who.int/en/what-we-publish/information-for-the-media/sections/press-releases/2008/04/protecting-health-from-climate-change

Directly and indirectly, climate change profoundly affects health, leading to a substantial burden on health systems. Well designed health systems can play a pivotal role in protecting health from climate change. While climate change has largely been framed in terms of environmental and economic concerns, experts are calling for a greater role for health systems in dealing with its immediate and future health consequences.

Health systems are best placed to act as advocates together with other sectors where reducing emissions can lead to co-benefits for health. For example, promoting a shift towards walking and cycling as means of transport can lower emissions of carbon, air pollutants and noise, while providing immediate opportunities to increase physical activity and reduce traffic-related injuries.

World Health Organization (WHO) (2010): **Climate Change and Health**
http://www.who.int/mediacentre/factsheets/fs266/en/index.html

This fact sheet outlines that:

- Climate change affects the fundamental requirements for health – clean air, safe drinking water, sufficient food and secure shelter.
- The global warming that has occurred since the 1970s was causing over 140 000 excess deaths annually by the year 2004.
- Many of the major killers such as diarrhoeal diseases, malnutrition, malaria and dengue are highly climate-sensitive and are expected to worsen as the climate changes.
- Areas with weak health infrastructure – mostly in developing countries – will be the least able to cope without assistance to prepare and respond.
- Reducing emissions of greenhouse gases through better transport, food and energy-use choices can result in improved health.

Road Traffic Safety and Protection against Accidents

Road traffic injuries represent the most apparent, and one of the most significant, effects of transport on health. Road traffic injuries include both deaths and non-fatal injuries resulting from motor vehicle crashes. The health consequences of motor vehicle crashes are well documented and are responsible for a considerable proportion of morbidity, disability and mortality, despite declining injury rates in some developing countries.

Road traffic also has impacts on mental health. Studies have found that 14 percent of survivors of motor vehicle crashes suffer from post traumatic stress disorder, 25 percent have psychological problems one year after a crash, and one-third have clinical symptoms at follow-up 18 months afterwards.

This section describes the risks of road transport and the prevention of possible accidents.

Elder et al. (2004): **Effectiveness of Mass Media Campaigns for Reducing Drinking and Driving and Alcohol-Involved Crashes**
http://meagherlab.tamu.edu/M-Meagher/%20Health%20Psyc%20630/Readings%20630/Healthcompro/mass%20media%20drink%2004.pdf

This paper provides a systematic review of the effectiveness of mass media campaigns for reducing alcohol driving (AID) and alcohol-related crashes, which was conducted for the Guide to Community Preventive Services (Community Guide). In eight studies that met quality criteria for inclusion in the review, the median decrease in alcohol-related crashes resulting from the campaigns was 13% (interquartile range: 6% to 14%). Economic analyses of campaign effects indicated that the societal benefits were greater than the costs. The mass media campaigns reviewed were generally carefully planned, well executed, attained adequate audience exposure, and were implemented in conjunction with other ongoing prevention activities, such as high visibility enforcement. According to Community Guide rules of evidence, there is strong evidence that, under these conditions, mass media campaigns are effective in reducing AID and alcohol-related crashes.

European Commission (EC) (2010): **EU Road Safety Plan for Next 10 Years - The EU Renews Its Target to Cut Annual Death Rate by Half**
http://ec.europa.eu/news/transport/100720_en.htm

In 2009, 35 000 people died in road accidents across the EU – 36% less than in 2001, when the commission first set its target of cutting the annual death rate by 50%. Young people and motorcyclists are among those most at risk.

Speeding, driving after drinking alcohol and not wearing a seatbelt are some of the leading causes of road deaths. But unsafe vehicles and poorly maintained roads also pose unnecessary risks. The new EU programme addresses all these issues.

European Transport Safety Council (ETSC) (2008): **"Vulnerable Road Users Organizations in Co-operation Across Europe" – An Europe-wide Campaign to Protect Vulnerable Road Users**
http://www.etsc.eu/Voice.php

ETSC has established a European Network of NGOs promoting the interests of vulnerable road users - VOICE. This network planned and directed common activities.

The principle aim of this ETSC activity was to raise awareness of the needs of vulnerable road users among EU policy makers such that they more readily accepted responsibility for the implementation of the measures necessary for the protection of cyclists and pedestrians.

Background for this ETSC initiative was the fact that every year around 43,000 people are killed on EU roads, whilst more than three million are injured. Vulnerable road users, such as the cycling child, or the elderly pedestrian, are the most at risk. To transport policy makers, the needs of these vulnerable travelers are frequently somewhat neglected if not forgotten: they have become the "forgotten travelers" of transport policy.

FIA Foundation for the Automobile and Society (2009): **Seat-Belts and Child Restraints: A Road Safety Manual for Decision-Makers and Practitioners**
http://whqlibdoc.who.int/road_safety/2009/9780956140302_eng.pdf

The manual is a practical guide to implementing, enforcing and evaluating seat-belt and child restraint programs, and consists of a series of 'how to' modules. It provides evidence of why the use of seat-belts and child restraints is important and takes the users through the steps needed to assess the situation in their own countries. It then explains the steps needed to design, plan and implement a seat-belt and child restraint program. Finally, the manual guides users on how to monitor and evaluate such programs so that the results can be fed back into program design. For each of these activities, the document outlines in a practical way the various steps that need to be taken.

Global Road Safety Partnership (GRSP) (2007): **Drinking and Driving: A Road Safety Manual for Decision-Makers and Practitioners**
http://whqlibdoc.who.int/publications/2007/9782940395002_eng.pdf

Drinking and driving is one of the main causes of road crashes worldwide. Effective drinking and driving programs have the potential to save thousands of lives, and was identified by the World report on road traffic injury prevention as a proven and effective measure to reduce death and injury on the road.
This manual for decision-makers and practitioners, proposes simple, effective and low-cost solutions to prevent drinking and driving that can be implemented on a national or local level. It targets governments, non-governmental organizations and road safety practitioners, particularly those in low and middle-income countries.

Global Road Safety Partnership (GRSP) (2008): **Speed Management: A Road Safety Manual for Decision-Makers and Practitioners**
http://whqlibdoc.who.int/publications/2008/9782940395040_eng.pdf

This speed management manual proposes simple, effective and low-cost solutions to excessive and inappropriate speed that can be implemented on a national or local level. It targets governments, non-governmental organizations and road safety practitioners, particularly those in low- and middle-income countries. The manual is based on a modular structure that provides evidence, examples, case studies and practical steps on how to manage vehicle speed.

Physics and Car Safety: **The Importance of Seatbelts**
http://tristanmac.tripod.com/id9.html

This internet portal displays how physics is involved in automobile collisions and how physics can and has been used to prevent injuries in collisions. The aspects that are primarily being dealt with are things such as seatbelts, airbags, headrests, etc.

The job of the seatbelt is to hold the passenger in place so the passenger is almost part of the car which prevents the passenger from flying forward as the car stops abruptly in the case of a collision.

World Health Organization (WHO) (2005): **United Nations Road Safety Collaboration: A Handbook of Partner Profiles**
http://whqlibdoc.who.int/publications/2005/9241592796.pdf

This document reflects the road safety profiles of partner organizations who participated in the 1st UN road safety collaboration meeting in October 2004. Each profile contains an overview of the organization's activities that pertain to road safety and provides contact names and email addresses.

World Health Organization (WHO) (2006): **Helmets: A Road Safety Manual for Decision-Makers and Practitioners**
http://whqlibdoc.who.int/publications/2006/9241562994_eng.pdf

This manual provides practical advice to road safety practitioners on how to achieve a much higher proportion of users of two-wheeled vehicles wearing helmets. It follows on from the World report on road traffic injury prevention, which described evidence that setting and enforcing mandatory helmet use is an effective intervention for reducing injuries and fatalities among two-wheeler users.

The manual is for use in countries that want to improve the rates of helmets use among users of two-wheelers, locally or at national level. It is targeted at governments, nongovernmental organizations and road safety practitioners. Together with providing the necessary background evidence that will be useful to anyone

starting a helmet programme, it provides technical advice on the steps needed to assess the helmet situation in a country, on how to design and implement a helmet use programme in response to such an assessment, and on the need to evaluate the programme so that the impact of what has been implemented can be assessed, and so that the programme can be improved accordingly.

World Health Organization (WHO) (2006): **World Day of Remembrance for Road Traffic Victims: A Guide for Organizers**
http://whqlibdoc.who.int/publications/2006/9241594527_eng.pdf

This book provides practical guidance to people or groups on how to plan and organize events on this day. It gives a brief history of the day, offers suggestions on how to plan the day and provides examples of specific activities that can be organized. All those concerned with road safety activities are encouraged to use this guide to organize annual events in different parts of the world to ensure that the advocacy opportunity of this day is fully realized.

World Health Organization (WHO) (2007): **First United Nations Global Road Safety Week**
http://www.who.int/roadsafety/week/en/index.html

Young people from more than 100 countries adopted the “Youth Declaration for Road Safety” in April 2007. It was adopted by 400 delegates to the first World Youth Assembly for Road Safety, being held in Geneva, Switzerland. They committed to take practical measures to improve road safety and called on adults to play their part as parents and leaders.

World Health Organization (WHO) (2009): **Global Status Report on Road Safety**
http://www.who.int/violence_injury_prevention/road_safety_status/2009/en/index.html

Approximately 1.3 million people die each year on the world's roads, and between 20 and 50 million sustain non-fatal injuries. The “*Global status report on road safety”* is the first broad assessment of the road safety situation in 178 countries, using data drawn from a standardized survey. The results show that road traffic injuries remain an important public health problem, particularly for low-income and middle-income countries. Pedestrians, cyclists and motorcyclists make up almost half of those killed on the roads, highlighting the need for these road users to be given more attention in road safety programmes. The results suggest that in many countries road safety laws need to be made more comprehensive while enforcement should be strengthened.

The Global Status Report on Road Safety results clearly show that significantly more action is needed to make the world's roads safer.

World Health Organization (WHO) (2010): **Data Systems: A Road Safety Manual for Decision-Makers and Practitioners**
http://whqlibdoc.who.int/publications/2010/9789241598965_eng.pdf

Road transport is vital to development. Unfortunately, inadequate attention to safety has meant that road transport systems have developed in ways that have led to significant loss of lives, health and wealth. Reliable and accurate data are needed to raise awareness about the magnitude of road traffic injuries, and to convince policymakers of the need for action.

Data relevant to road safety is collected every day in most countries, but for this data to be useful for informing road safety practice, it must be properly coded, processed and analyzed in a computerized database system. The purpose of this manual is to give practical guidance on establishing data systems that produce timely and reliable data on road traffic injuries that can be used to inform and facilitate road safety management.

Health Benefits of Public Transit, Walking and Cycling

The most beneficial health impact of transport is the potential for physical activity through walking and cycling, while other transport modes such as the private car can reduce physical activities of users. Several papers in this section also give the economic appraisal of health effects related to walking and cycling.

Hindustantimes (2009): **Taking Public Transit May Help You Keep Fit**
http://www.hindustantimes.com/News-Feed/goodliving/Taking-public-transit-may-help-you-keep-fit/Article1-393760.aspx

This article from an Indian newspaper points out that people may keep themselves fit by taking public transit, if a new study from the University of British Columbia is to be believed. The university researchers found during the study that people who took public transit are three times more likely to meet the daily minimum of physical activity which suggested by the Heart and Stroke Foundation of Canada's, compared to those who did not.

Kahlmeier et al. (2010): **"Health in All Policies" in Practice: Guidance and Tools to Quantifying the Health Effects of Cycling and Walking**
http://www.euro.who.int/__data/assets/pdf_file/0009/97344/E93592.pdf

There is growing interest in "Health in All Policies" approaches, which aim at promoting health through policies which are under the control of non-health sectors. While economic appraisal is an established practice in transport planning, health effects are rarely taken into account. An international project was carried out to develop guidance and tools for practitioners for quantifying the health effects of cycling and walking, supporting their full appraisal. *Development process:* A systematic review of existing approaches was carried out. Then, the products were developed with an international expert panel through an extensive consensus finding process. *Products and applications:* Methodological guidance was developed which addresses the main challenges practitioners encounter in the quantification of health

effects from cycling and walking. A “Health Economic Assessment Tool (HEAT) for cycling” was developed which is being used in several countries. *Conclusions:* There is a need for a more consistent approach to the quantification of health benefits from cycling and walking. This project is providing guidance and an illustrative tool for cycling for practical application. Results show that substantial savings can be expected. Such tools illustrate the importance of considering health in transport policy and infrastructure planning, putting “Health in All Policies” into practice.

Transport for London (ongoing): **Can promoting physical activity in the workplace reduce absenteeism?**
http://www.tfl.gov.uk/assets/downloads/corporate/Physical-activity-absenteeism-and-productivity-summary.pdf

One of the many benefits of having a workplace travel plan in place is that, by encouraging walking and cycling, it helps employees to exercise as part of their daily commute.

While there is already considerable scientific evidence which shows the health benefits of walking and cycling to the individual, less is known about whether these benefits will lead to a measurable reduction in the time taken off work owing to sickness. To address this question, Transport for London (TfL) has commissioned TRL Ltd and physical activity specialist Dr Adrian Davis of JMP Consulting to carry out a thorough review of the available evidence into the effects of workplace physical activity promotion on levels of absenteeism and productivity.

Victoria Transport Policy Institute (VTPI) (2010): **Evaluating Public Transportation Health Benefits**
http://www.apta.com/resources/reportsandpublications/Documents/APTA_Health_Benefits_Litman.pdf

This report investigates ways that public transportation affects human health, and ways to incorporate these impacts into transport policy and planning decisions. This research indicates that public transit improvements and more transit oriented developments can provide large but often overlooked health benefits. People who live or work in communities with high quality public transportation tend to drive significantly less and rely more on alternative modes (walking, cycling and public transit) than they would in more automobile-oriented areas. This reduces traffic crashes and pollution emissions, increases physical fitness and mental health, and provides access to medical care and healthy food. These impacts are significant in magnitude compared with other planning objectives, but are often overlooked or undervalued in conventional transport planning. Various methods can be used to quantify and monetize (measure in monetary units) these health impacts. This analysis indicates that improving public transit can be one of the most cost effective ways to achieve public health objectives, and public health improvements are among the largest benefits provided by high quality public transit and transit-oriented development (Source: Report Abstract).

World Health Organization (WHO) (2007): **Economic Assessment of Transport Infrastructure and Policies: Methodological Guidance on the Economic Appraisal of Health Effects Related to Walking and Cycling**
http://www.euro.who.int/__data/assets/pdf_file/0008/87479/E90944.pdf

This document presents the current state of evidence on a number of key methodological issues that have arisen around the economic assessment of transport infrastructure and policies with regards to the inclusion of health effects related to walking and cycling. Based on this discussion options and guidance will then be provided towards a more harmonized methodology for the economic appraisal of health effects related to walking and cycling.

The guidance has been further developed into an illustrative tool which shows how the methodology can be applied to the assessment of health effects related to cycling.

World Health Organization (WHO) (2008): **Methodological Guidance on the Economic Appraisal of Health Effects Related to Walking and Cycling: Summary**
http://www.euro.who.int/__data/assets/pdf_file/0007/87478/E90944sum.pdf

Economic appraisal is an established practice in transport planning. However, the health effects of transport interventions are rarely taken into account in such analyses. This project had two aims: to review recent approaches to cost–benefit analysis of transport-related physical activity; and to develop guidance on approaches to including the health effects of transport-related physical activity in economic analyses of transport infrastructure and policies.

World Health Organization (WHO) (2008): **Health Economic Assessment Tool for Cycling (HEAT for Cycling)**
http://www.euro.who.int/__data/assets/pdf_file/0011/87482/E90948.pdf

This guide is an introduction to the World Health Organization Health Economic Assessment Tool for Cycling (HEAT for cycling).

The tool has been produced to illustrate the principles outlined in the WHO document *Methodological Guidance on the Economic Appraisal of Health Effects Related to Walking and Cycling* and to assist anyone who wishes to conduct an economic appraisal of the health effects related to increased cycling. It is designed to complement existing tools for economic appraisals of transport interventions which have traditionally tended to focus on other issues such as emissions or congestion.

The tool will produce an estimate of the mean annual benefit (per cyclist; per trip; and total annual benefit) due to reduced mortality as a result of cycling.

GTZ – Sustainable Urban Transport Project (SUTP)

Based on more than 25 years of practical experiences, GTZ hosts the "Sustainable Transport: A Sourcebook for Policy-Makers in Developing Cities" (www.sutp.org) with a wealth of information and knowledge on appropriate solutions, inter alia on tackling climate change in the transport sector. Through training and advisory services, decision makers in the transport sector are better informed about transport options, mode choices, mobility management and transport related emissions and their impact on our climate. This may lead to improved urban transport systems, less traffic and better alternatives to individual motorized transport modes.

This flagship publication compiles most of the international literature on the relevant subject and provides access to numerous other resources. It is complemented by training courses targeted to policymakers, planners or engineers in cities, regional entities and federal governments.

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Cover photo:
Carlos Pardo
Bangkok, 2006

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