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The Health Benefits of Transport Projects: A Review of the World Bank Transport Sector Lending Portfolio

Background Paper for the IEG Evaluation of World Bank Support for Health, Nutrition, and Population

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The Health Benefits of Transport Projects: A Review of the World Bank Transport Sector Lending Portfolio

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Background paper for the IEG evaluation of World Bank support for health, nutrition, and population

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EXECUTIVE SUMMARY

The transport sector plays a crucial, overarching role in the global economy: it facilitates access to jobs, education, health care, markets as well as for social and leisure activities. Yet, transport also has detrimental impacts on the environment and on human health, and this can result in conflicts in the formulation and application of transport policy. While traffic injuries, fatalities, and annoyance from transport-related noise have long been identified as negative externalities, there has been increasing evidence in the past decade of direct effects of transport-induced air pollutants on mortality and respiratory disease. The adverse impacts of transport on health are worse in developing countries than in industrial countries, as resources are more limited, regulatory controls are often inadequate and poorly enforced, the transport fleet tends to be older and technically more inefficient, the population is generally less educated, and transport-related law enforcement is frequently inadequate

This paper reviews the contribution of the World Bank's transport lending portfolio to health outcomes, as background for the Independent Evaluation Group's (IEG) evaluation of the Bank's support for health, nutrition and population (HNP). Over the past decade (FY97-06), the World Bank committed nearly $28 billion to 229 new transport projects managed by the Transport Sector Board (TSB). Specifically, the paper reviews the extent to which these projects: cite potential health benefits or risks in design documents; include specific objectives with respect to improving health outcomes or mitigating health risks; propose environmental improvements that are likely to provide health benefits; target transport services and both health and behavioral outcomes to the poor; and plans to collect evidence on changes in health outcomes as a result of transport interventions. For completed projects, it assesses the extent to which expected health benefits or objectives have been achieved.

Half of TSB-managed projects in the last decade have had a health focus, defined as those that cited anticipated health benefits or mitigating a health hazard, that had explicit health objectives for which they were accountable, or financed components or activities with plausible health benefits; this share rose from a third of projects in the first half of the period to two-thirds in the second half. The benefits cited most frequently were safety-related, primarily road safety; improvements in air quality and a reduction in harmful emissions and prevention of HIV transmission along transport corridors were cited in a minority. Transport projects in middle-income countries were more likely to have a health focus that those in low-income countries. A quarter of TSB projects planned to collect health *outcome* indicators, but very few planned to collect health *output* indicators that would help to establish attribution between the activities financed and health outcomes.

Among the 105 projects approved from FY97-06 that had closed, a quarter (28) had explicit health objectives or financed components with potential health benefits. All of the planned road safety, waterway and port safety components were implemented, while more HIV/AIDS components were implemented than planned at project appraisal. Closed projects with explicit health objectives were more likely to plan to collect health indicators and to actually collect them than were projects with health components absent from these objectives.

All fifteen TSB-managed projects that measured health outcomes had to do with transport safety (13 of them road safety), and in all but one case the indicators suggest an improvement in road safety. The attribution of these outcomes to the projects' outputs was not always clear, however, because of: inadequate documentation of outputs; failure to consider other factors that might have affected the accident rate; and lack of specificity of the data to the areas covered by the project interventions. Addressing these issues would help to assess with greater certainty the effectiveness of these safety efforts.

The reason why a minority of road projects has explicit objectives to minimize health hazards remains unclear. Any road project that leads to faster travel speeds also has the potential to increase the severity of accidents that occur. It would be sensible for all road projects during appraisal to address this issue and to implement and monitor any mitigation measures.

None of the small number of closed transport projects with HIV/AIDS components collected data on health outcomes, so the effectiveness of these activities is unknown. A recent update on the implementation of the Bank's *Global HIV/AIDS Program of Action* notes, however, that more than half of the projects in the active transport lending portfolio include HIV/AIDS activities, most of them 'retro-fitted' after the projects were approved. Thus, these projects are unlikely to have an explicit HIV/AIDS objective for which they are accountable; it remains to be seen whether they will actually collect and report output and outcome data that would yield insights into their effectiveness. The experience in the rest of the transport portfolio suggests that health indicators are rarely collected in the absence of explicit health objectives.

Finally, this review of project documents has not yet led to insights on the operational linkages between the transport and health sectors that may help to explain why some projects succeed in reporting and achieving improvements in health outcomes and others do not, or whether intersectoral collaboration in implementation has any impact on the effectiveness of these interventions. However, the next step would be to learn more about the reasons for the data patterns uncovered by follow-up interviews with transport staff, as the basis for recommending how the performance of health components of transport projects can be improved.

List of Acronyms and Abbreviations

AFR	Africa region
DALY	Disability-adjusted life years
EAP	East Asia and the Pacific region
ECA	Eastern Europe and Central Asia region
FY	Fiscal Year
GEF	Global Environment Facility
HNP	Health, Nutrition and Population
ICAO	International Civil Aviation Organization
ICR	Implementation Completion and Results Report
IEG	Independent Evaluation Group
LIC	Low income countries
LCR	Latin America and Caribbean region
LMIC	Lower middle income countries
MAP	Multi-Country AIDS Program
MNA	Middle East and North Africa region
OED	Operations Evaluation Department (now IEG)
PAD	Project Appraisal Document
PPAR	Project Performance Assessment Report
SAR	South Asia region
TSB	Transport Sector Board
UMIC	Upper middle income countries
WHO	World Health Organization

1. INTRODUCTION

1.1 The transport sector plays a crucial, overarching role in the global economy: it facilitates access to jobs, education, health care, markets as well as for social and leisure activities. Yet, transport also has detrimental impacts on the environment and on human health, and this can result in conflicts in the formulation and application of transport policy. While traffic injuries, fatalities, and annoyance from transport-related noise have long been identified as negative externalities, there has been increasing evidence in the past decade of direct effects of transport-induced air pollutants on mortality and respiratory disease[1].

1.2 Poverty and poor health continue to be mutually reinforcing conditions and there are substantial grounds to demonstrate that the negative impacts of transport on health are worse in developing countries than in industrial countries. In developing countries where resources are more limited, regulatory controls are often inadequate and poorly enforced, the transport fleet tends to be older and technically more inefficient, the population is generally less educated, and transport-related law enforcement is frequently inadequate.[2] Improving traffic safety is an evolutionary process linked to income. In this regard it is worth noting that in the case of road safety the trend from low to high income status seems to follow the same pathway as environmental improvements, in the form of an environmental 'Kuznets curve'.[3] Road crash fatalities per capita increase until around US$8,000 per capita, then begin to decline, presumably as awareness of the problem becomes sufficient for concerted management measures to be taken.

1.3 This paper reviews the contribution of the World Bank's transport lending portfolio to health outcomes, as background for the Independent Evaluation Group's (IEG) evaluation of the Bank's support for health, nutrition and population (HNP). Over the past decade (FY97-06), the World Bank committed nearly $28 billion to 229 new transport projects managed by the Transport Sector Board (TSB). Specifically, the paper reviews the extent to which these projects: cite potential health benefits or risks in design documents; include specific objectives with respect to improving health outcomes or mitigating health risks; propose environmental improvements that are likely to provide health benefits; target transport services and both health and behavioral outcomes to the poor; and plans to collect evidence on changes in health outcomes as a result of transport interventions. For completed projects, it assesses the extent to which expected health benefits or objectives have been achieved.

1.4 The paper is organized into six sections. Following this short introduction, an overview of transport-related health impacts is given, followed by a short overview of Bank sector strategies on health and transport. The fourth section describes the scope of the review and the methodology used, the fifth section presents the detailed findings for

[1] WHO 2000
[2] WHO 2004
[3] Kopits and Cropper, 2003

all approved projects as well as closed projects, and the last section summarizes the findings and concludes by raising issues for further study.

2. THE HEALTH IMPACTS OF TRANSPORT PROJECTS

2.1 Transport projects can produce important health benefits in terms of improved access to health care and emergency responses. In rural areas lack of access to all weather roads prevents some communities from easily reaching health care facilities. Transport is clearly essential for the distribution of drugs, blood and other medical supplies. Better transport can also play a critical role in terms of access to emergency obstetric care, which can have an important impact on reducing maternal and infant mortality.

2.2 Moreover, better access to markets can lead to greater income, and improved nutrition and health. However, better access to health care facilities is a necessary, but insufficient condition for better health outcomes. For example, it is possible to travel quickly to a health facility, only to receive bad care. In such a case better access due to improved roads may have no health benefits whatsoever.

2.3 Improved transport can also pose considerable health risks (see Table 2.1). These health risks include: transport accidents (both of vehicle users and pedestrians); air, water and noise pollution; facilitating the spread of communicable disease; and a more sedentary lifestyle as fewer people walk or bike to their destinations.

2.4 There are potential synergies arising from reducing potential health risks. Lower network speeds will produce lower road deaths and injuries, and also reduce emissions. More walking and cycling will also reduce emissions, but will require more attention to road safety risks to ensure that appropriate protective features are provided in the road network. Both policies will reduce energy consumption (a non-health related bonus).

Table 2.1: Potential health risks of transport projects and policies to mitigate them

Potential health risks	Policies and interventions to prevent or mitigate health risks
Transport safety	
Accidents (all transport modes)	Rectification of hazardous locations; traffic management improvements; public transport priority measures; behavior change measures such as attitudes to seat belt usage and alcohol use when driving; vehicle safety improvements.
Security-related incidents	Improvement of terminal security (ports, rail and bus stations, airports); reduction of risk of aviation and maritime accidents through upgrading navigational aids and improved enforcement of safety standards.
Pollution	
Air pollution	Reduction of emissions and particulates to provide cleaner air; establishment of policies to ameliorate air pollution such as standards for exhaust emissions.
Noise pollution	Reduction of noise pollution through noise barriers or compensation of affected citizens; establishment of policies to ameliorate noise pollution such as introducing standards for permissible engine noise.
Water pollution	Proper handling and prevention of ships' waste; Prevention of marine oil spills; Reduction in run-off from roads and streets into natural water systems.
Spread of communicable diseases	
Disease transmission	Awareness, behavior change communication, promotion of condoms along roadways and at border crossings to prevent HIV/AIDS transmission. Prevention of the spread of infectious diseases, like SARS and avian influenza, via air travel.
Promotion of sedentary lifestyle	
Reduced physical activity, increasing risks of heart ailments, cancer and diabetes.	Encourage more walking and cycling, less use of motorized vehicles especially for short trips. Changes in planning and land use to curb the use of private motor vehicles.

TRANSPORT SAFETY

2.5 Accidents occur in all modes of transport, but the extent of road traffic accidents caused the World Health Organization (WHO) in 2004 to declare that road traffic injuries constitute a major public health and development crisis.[4] Every year, 1.2 million people are known to die in road accidents worldwide (over 3,000/day) and as many as 50 million more are injured, with some suffering permanent disabilities. Projections indicate that these figures will increase by about 65 percent over the next 20 years unless there is a radical commitment to widening the reach of prevention. [5] The public, however, has become inured to these statistics, and the figures attract less mass media attention than other less frequent but more spectacular types of accident, such as aircraft crashes.

[4] WHO 2004
[5] Kopits and Cropper, 2003

2.6 A disturbing aspect of these data is that 80 percent of the deaths and 90 percent of losses because of road traffic injuries occur in low and middle-income countries. [6] The economic cost of road crashes and injuries is estimated to be 1 percent of gross national product in low income countries and 1.5 percent in middle income countries. This is $65 billion more than these countries receive in development assistance.[7] One good reason to expect that the negative impacts on health will be worse in developing countries is that they are facing traffic conditions with far higher levels of vulnerability in terms of pedestrians and non-motorized road users. Compounding this vulnerability is the rapid rate of motorization that is predicted, far outstripping our historical experience so far.

2.7 Historically, motor vehicle "accidents" have been viewed as random events that are unpredictable and cannot be managed, but in recent years there has been a shift in perception as it has become increasingly recognized that the accident rate can be lowered through rational analysis and remedial action. Successes have been achieved in several industrialized countries including Australia, Canada, France, Japan, New Zealand, UK and the United States in reducing the fatality rate, but at the same time fatality rates in many developing countries experiencing rapid motorization, such as China, Colombia, India and Malaysia, have been increasing dramatically.[8] The successful industrialized countries reported that improvements followed an integrated, multi-facetted approach to road safety issues.

2.8 While a decrease in deaths due to road traffic accidents of around 30 percent is forecast between 2000 and 2020 in high-income countries, this will be more than offset by a huge increase in traffic-related deaths expected in the rest of the world during the same period; if no action is taken, road traffic injuries could become the sixth leading cause of the global burden of disease and injury by 2015,[9] measured in disability-adjusted life years (DALY). There are a number of interventions and policies (broadly listed in Table 2.1) that can be utilized to mitigate these health risks.

2.9 ***Elimination of hazardous locations.*** Typically the elimination of hazardous locations occurs when a road is rehabilitated or upgraded. The traffic authorities have knowledge of the most dangerous sections of road and minor infrastructure improvements are carried out to make the road safer. Often this involves improving sight distance, reducing the incidence of sharp curves, replacing unsafe structures and improving road signage. The idea is that the accident rate will improve. However, sometimes the higher vehicle speeds resulting from the improvements lead to increased severity of collisions, so it is not a foregone conclusion that such project components will lead to improved safety in all cases.

2.10 ***Improvements in road traffic management, bus priority, and risk behavior.*** This category covers a wide range of improvements, including installation and coordination of computer-controlled traffic signals, lane markings, warning signs and

[6] Losses are calculated in terms of annual disability-adjusted life years
[7] Jacobs, Aeron-Thomas, and Astrop 2000
[8] WHO mortality database
[9] In 1990, road traffic accidents were ranked 9th WHO 2004; in a later work, WHO 2005, Mathers and Loncar predict an upward ranking to 6thby 2015. The impact on men and on children is particularly severe.

studs, pedestrian crossings, sidewalks, underpasses, bicycle paths, street lights, traffic calming measures, and speed limits.

2.11 For public transport, priority bus-bays, segregated busways, and bus priority lanes are typical features. Schemes to promote public transport usage and reduce private vehicle usage also result in safety enhancement because public transportation is generally a safer means of travel.

2.12 Some interventions target human behavior and involve enforcement of regulations to ensure seat belts are worn, drunk-driving limits are respected, and helmets are worn by motorcyclists. The literature gives examples of the effect of such measures; for example in Malaysia, where legislation was introduced in 1973, it was estimated that the introduction of a helmet law led to a 30 percent reduction in motorcycle deaths.[10] In Sweden and the United States research has shown that seat belt reminders with audible warnings are an effective means of increasing seat belt use. In Sweden it was estimated that the introduction of such systems contributed to a reduction in car occupant deaths of 20 percent.[11] An international review of the effectiveness of random breath testing found that alcohol-related crashes reduced by about 20 percent.[12]

2.13 While the interventions described above have measurable outcomes, there are also a number of components with important outputs, but whose impact is less easily assessed. These components are aimed at strengthening the institutional capacity for road safety which could include training, the setting up of coordinating bodies, improving legislation pertaining to traffic laws, improving enforcement capability, streamlining road safety into road work design activities, and improving response to assist at the accident scene and to ensure injured persons receive urgent emergency treatment. Good data are also essential to measure performance and this entails the setting up of systems to record and analyze information about road accidents including data capturing, definitions,[13] and analysis. WHO reports that only 75 countries fully complete the vital information returns pertaining to road traffic injuries, while a further 35 countries submit incomplete data; some countries have no workable systems at all.[14]

2.14 ***Other transport safety interventions*** Other transport modes experience much lower numbers of accidents. Some components of such projects relate to port and inland waterway safety, aviation safety and safety on public transport. In this review only one component was identified directly relating to the improvement of health facilities (in the Chile Santiago Urban Transport Project).

[10] Supramaniam and others 1984
[11] Larsson and others 2000
[12] Elder 2002
[13] Since not all fatalities occur at the scene of the accident and some people die of their injuries only some time later, rules need to be set about what to include in the accident data. There is growing acceptance that deaths occurring within 30 days of the accident are recorded as road fatalities, and that deaths at railway crossings are counted as road deaths. WHO 2004
[14] WHO 2004

2.15 Aviation safety has become an important and even controversial topic because certain developing country airlines with poor safety records have been banned from the airspace of industrial countries. In recent years there has been a trend to try to upgrade both aviation safety in developing countries (mainly through improved navigational aids) and transport security globally, especially at airports, following various terrorist incidents and threats.

POLLUTION

2.16 Concern about transport-related pollution has also been growing, especially in the urban environment where road traffic congestion prevails. Air quality has also assumed new importance in the context of greenhouse gas emissions;[15] road transport alone accounts for nearly a quarter of man-made gases believed to be contributing to climate change. Fine particles are emitted from vehicle exhaust systems as a product of combustion, especially from diesel engines. In developing countries this may be worsened because of poorly maintained or badly adjusted engines. Non-exhaust particulate matter also results from tire wear as well as dust from brake pads and shoes. The WHO estimates that suspended particulate matter leads to the premature death of over 500,000 people per year.[16]

2.17 Much of the growth in the world's population for the foreseeable future will take place in the cities and towns of the developing world and this has significant implications in respect of likely vehicle emissions. Already almost half of the world's population, or some 3.3 billion people, live in urban or peri-urban areas[17] and 600 million additional people are expected to migrate from rural areas to cities in the next ten years. To put this in perspective, this urbanization trend is equivalent to 60 additional cities roughly the size of London or Moscow. The volume and spatial distribution of the emissions, as well as dispersal conditions, affect pollution levels. Urban planners also have a crucial role to play that can affect the degree of exposure of the population to pollution.

2.18 Other kinds of transport-related pollution focus mainly on aviation emissions, pollutants in water run-off from transport infrastructure, and the effects of noise, especially near airports and busy highways. In the maritime sector oil spills and disposal of waste from ships are important issues.

FACILITATING DISEASE TRANSMISSION

2.19 Transport corridors can be a conduit for the transmission of diseases. HIV/AIDS in particular is known to be spread along major transport routes by transport workers, especially truck drivers, and their sexual partners. Transport construction sites can also be the foci for HIV/AIDS transmission. These risks are addressed through interventions that provide information, promote behavior change (fewer partners, safe sex, condom use), and provide STD treatment along transport routes and at construction sites. The outbreak of severe acute respiratory syndrome (SARS) in 2002-3 highlighted the potential role of

[15] Stern 2006
[16] WHO 2002
[17] Economist 2007 (49.2% of world's population is urbanized); UN Population Fund Report 2007

air transport in international disease transmission. The potential for occurrence of a pandemic caused by avian influenza, for example, is being closely monitored by the United Nations System Influenza Coordination Group, while standards aimed at preventing disease transmission via aircraft (as far as is practically possible) are enforced by the International Civil Aviation organization (ICAO).

SEDENTARY LIFESTYLES

2.20 Linked to the growth of cities and increasing use of motorized transport, is the increased likelihood of sedentary lifestyles by urban dwellers. Reduced physical activity is estimated to be responsible for some 1.9 million deaths globally every year as a result of disease such as heart ailments, cancer and diabetes.[18]

3. THE EVOLUTION OF WORLD BANK SECTORAL POLICIES ON TRANSPORT AND HEALTH

3.1 Strategies emanating from both the transport and the health sectors have highlighted policies to improve the health benefits or mitigate the health risks with respect to transport interventions. They focus on three main concerns – transport safety, harmful emissions, and the spread of HIV/AIDS.

Transport safety

3.2 Two transport sector strategy documents have helped shape the Bank's approach to transport in relation to health issues during the review period of this study. The first, entitled *Sustainable Transport* (1996)[19], advocated substantial changes in the role of government in transport, reducing its function as a supplier, but increasing its function as a regulator. It viewed sustainability in a comprehensive sense, covering economic, financial, environmental and social sustainability. The second, called *Cities on the Move* (2002)[20], focused specifically on urban transportation.

3.3 *Sustainable Transport* accorded a higher priority to moving people rather than vehicles, ensuring greater safety in transport, and minimizing adverse effects on health. It recommended benchmarked safety programs and the adoption of cleaner fuels as well as encouraging a more systematic estimation of the impact of transport programs on safety and air pollution. Moreover, it highlighted three road-related areas where the Bank could improve its advice and reduce the accident rate, namely; the separation of motor vehicles from pedestrians and non-motorized traffic such as bicycles; improvements in driver behavior through better education, regulation, and enforcement; and the introduction of geometric road designs that would take into account the large number of vulnerable road users in developing countries.

[18] WHO 2002
[19] World Bank 1996a
[20] World Bank 2002

3.4 *Cities on the Move* estimated that up to 15 million people are injured annually in urban road accidents in developing countries. It recommended that a key first step to improving traffic safety was the development of a national road accident data collection and analysis capability, supported by institutional arrangements to ensure that such data were transmitted to those who needed them for policy purposes. It endorsed the viewpoint that accident frequency and severity can be reduced by improved road design and traffic management measures. Furthermore, it recognized that poor people tend to be the most vulnerable to the effects of air pollution and that our understanding of the environmental impacts of urban transport is deficient.

3.5 Both strategy papers focus mainly on the road mode of transport when referring to health issues[21] and both flag road safety and air pollution as areas to receive greater attention. In practice, improving air quality received much less attention, possibly because this area requires specialist knowledge beyond road design and traffic management, which are the comfort zones for most task managers in the transport sector. Nevertheless, some indirect amelioration of poor air quality is likely to have been achieved through better urban planning, installation of centralized traffic management systems, and the development of less polluting vehicle fuels.

3.6 The building of countrywide data systems is included as part of this strategy. An early example of this approach was the Road Improvement and Traffic Safety Project in Turkey.[22] The road safety objective of this project was substantially achieved, but its full potential was not realized because follow up was impacted by the financial crisis affecting Turkey at the time.[23] Nevertheless, between 1996 and 2000 the number of accidents declined from 3,635 to 921 annually and the number of fatal injury accidents nationally also declined, although a number of exogenous factors could have also contributed to this result. Recently a stand-alone road safety project has been launched in Vietnam, which experiences problems worsened by a high percentage of two-wheeled traffic.[24]

3.7 Following publication of the Bank's *Cities on the Move,* a road safety specialist was appointed in the transport anchor and collaborative work with the World Health Organization (WHO) was launched.

3.8 Further impetus to the road safety theme was given by the publication of the *World Report on Road Traffic Injury Prevention*—jointly issued by WHO and the World Bank in 2004[25]—which highlighted the growing public health burden of road deaths and injuries in low and middle income countries, and represented a collaborative effort from

[21] There is an active project, however, on air transport safety and security for West and Central Africa.
[22] World Bank 1996b
[23] OED 2005b
[24] World Bank 2005b.The outcome of this project is expected to yield many lessons and thus is being closely monitored. It comprises three components: institutional and capacity building, road safety demonstration and awareness program, and a road safety monitoring and evaluation program. Since its inception the project has doubled in scale with an infusion of funds from the Japanese Bank for International Cooperation.
[25] WHO 2004

staff in both the health and transport sectors. In a follow up note[26] the Bank summarizes the findings and provides guidelines to assist with the implementation of its recommendations. These guidelines require both countries and donor agencies to substantially scale-up and refocus their activities, with a strong emphasis on managing results. The first step should be a country capacity review to build a multisectoral framework for dialogue between counterparts in different ministries, between Bank staff working in different sectors, and between Bank staff and their client agencies.

Air pollution and harmful emissions

3.9 *Reducing Air Pollution from Urban Transport,* published by the Bank in 2004[27], was triggered by the growing concern about air pollution from road transport. It was not a product solely of the TSB, but rather of the Thematic Group on Air Quality and was duly approved by the then Environment, Transport, Energy and Mining Sector Boards. It proposed a framework for selecting and implementing policies, drawing lessons from international experience, and was especially directed towards cities in developing countries. It placed a special emphasis on how to coordinate policies across several sectors closely linked to the mitigation of air pollution from road transport—and how to reconcile the sometimes conflicting objectives and demands of these sectors to achieve environmental improvements. This document was clearly a seminal reference work in this field; it is unclear as to the extent it has been used by the Bank and its clients since publication, although it is often cited in the literature.[28]

3.10 *A Decade of Action in Transport,* an IEG evaluation issued in 2007[29] recommended that safety, energy efficiency and climate change receive much more attention in the future and this proposal is also incorporated in the Bank's draft updated transport sector strategy[30].The absence of international coordination by an accountable agency with a clear leadership role is also addressed. This updated transport sector strategy[31] focuses on the need for more complex projects including more projects on road safety, more attention to urban traffic congestion and air pollution reduction, and more effective public transport systems. Recently, a World Bank Global Road Safety Facility has been established to generate increased funding to reduce accident rates in developing countries. It is working with the Harvard Initiative for Global Health to improve the estimates of health losses from road deaths and injuries, with a view to arriving at comparable country by country data. Recently, a first consultative meeting was held at the World Road Congress in Paris in September, 2007.

[26] Bliss 2004
[27] Gwilliam and others 2004
[28] The Bank has been actively participating in the ICAO discussions on aviation emissions, with the objective of gathering all available information on the environmental impacts and its relevance to developing countries. Thus far this has not translated into project support, however.
[29] IEG 2007
[30] World Bank external consultation draft 2006
[31] Currently in preparation

Transport and the prevention of HIV/AIDS

3.11 The Bank's health sector considers transport a priority sector for HIV/AIDS interventions, both because of the risk of contracting and spreading HIV at construction sites and because people engaged in transport (truckers, taxi-drivers, railway and port workers, for example) travel a great deal away from their families and are at high risk of contracting and spreading HIV along transport routes.[32] The Africa region strategy, *Intensifying Action Against HIV/AIDS in Africa* (1999), committed to "mainstreaming" HIV/AIDS in all sectors, including transport. It also advocating "retrofitting" HIV/AIDS activities into ongoing projects in priority sectors like transport. The 2005 *Global HIV/AIDS Program of Action* commits to including HIV/AIDS in all construction contracts with World Bank funding and to adding HIV/AIDS activities to all new transport projects in India and Africa and all existing projects in Africa during mid-term review.[33]

3.12 In December 2003, following greater awareness of the link between transport and the spread of HIV/AIDS the Abidjan-Lagos transport corridor project[34] was launched with the objective of increasing access along the corridor to HIV/AIDS prevention, basic treatment, support and care services for underserved, vulnerable groups—including transport sector workers and their clients. This project was discussed in a paper published in 2005[35], which also listed other transport corridors with similar initiatives.

4. METHODOLOGY

4.1 This review systematically assesses the objectives or outcomes of Bank-supported transport projects with respect to any identified and anticipated health benefits and health risks that require prevention or mitigation. The transport projects reviewed include all active and closed projects approved over a ten year period between fiscal years 1997-2006 (FY97-06). Only those projects managed by the transport sector board have been included and for the purposes of the review this covers projects with financial commitments under the sector codes TA (roads and highways), TP (ports, waterways and shipping), TV (aviation), TW (railways) and TZ (general transportation – which includes urban transport). Supplemental credits and projects approved under emergency procedures are excluded. Transport projects managed by other sector boards were excluded because the resources needed to track down the relatively small number of such projects were not warranted.[36] An omission in this regard was transport projects related

[32] The priority of the transport sector is amply demonstrated by its emphasis in the HNP lending portfolio. Among the 54 freestanding AIDS projects or projects with AIDS components approved between FY97-06 and managed by the HNP sector, all but five identified transport workers as a high-risk group. In most projects in the Africa region Multi-Country AIDS Program (MAP), the transport sector is a prioritized sector for multisectoral involvement. (Source: Portfolio Review, IEG evaluation of HNP)
[33] World Bank 2005a, p. 39
[34] Managed by the HNP board
[35] Brushett and Osika 2005
[36] In the Transport Sector Review (IEG 2007), only 16 percent of all transport projects were managed under sector boards other than the TSB.

to improvements of air quality that fell either under the environment sector board or were funded through the Global Environmental Facility (GEF).

4.2 In total, 229 projects were reviewed: 126 projects approved from FY97-01 and 103 projects approved between FY02-06. One hundred and twenty four projects remain active while 105 have already closed (Table 3-1)[37]. A list of the projects reviewed is given in Annex 1.

Table 4.1: Transport Projects Included in the Portfolio Review

Fiscal Year of Approval	Active	Closed	Total
1997-2001	28	98	126
2002-2006	96	7	103
Total	**124**	**105**	**229**

4.3 The review assesses the design of transport projects on specific questions or themes in order to determine the extent to which health outcomes played a role in the rationale for the design and implementation of the projects approved over the past ten years. The Staff Appraisal Report or Project Appraisal Document (PAD) was reviewed for each project to answer the following questions:

(a) Were potential health benefits cited as a justification or a benefit of the project? Were potential health risks mentioned, in terms of the need to prevent or mitigate them?

(b) Did the project include explicit objectives with respect to improvements in health outcomes in general and, if so, what were they?

(c) Did the project finance any health components? If so, what kinds of activities and how much was committed to them? (This includes components to set up new institutions).

(d) Did the project propose to collect health indicators in general and/or among the poor and, if so, what indicators were supposed to be collected?

(e) Did the project specifically target behavior change interventions (in objectives or components) to improve health and, if so, what type of behavior change?

4.4 For completed projects, the following was recorded based on the Implementation Completion Reports (ICR) and the IEG Project Performance Assessment Reports (PPARs):

a) Were specific planned health components implemented including transport safety improvements, (especially road and aviation safety), the containing of the spread of infectious diseases along transport corridors, and the reduction of harmful vehicle emissions causing respiratory problems?

[37] The cut-off date for data download is from Business Warehouse is June 25, 2007.

b) Did the project actually collect data on health outcomes (even if not planned)? If so, did health outcomes improve and can they be linked to the project's activities?

c) For projects that had an explicit health objective, was it achieved?

5. FINDINGS

5.1 Approved World Bank commitments in the transport portfolio managed by the TSB between FY97-06 totaled US$27.02 billion, as shown in Table 5.1. For the period in question, 76 percent of transport projects were classified as road or road-related, rising from 75 percent in FY97-01 to 79 percent in FY02-06[38]. Thus it is hardly surprising that road safety features so prominently in transport-related health components.

Table 5.1: TSB-managed transport projects and commitments approved in FY97-06, by region

Region	FY97-01				FY02-06				Total: FY97-06			
	Projects		Commitments		Projects		Commitments		Projects		Commitments	
	Nbr	(%)	US$m	(%)	Nbr	(%)	US$m	(%)	Nbr	(%)	US$m	(%)
EAP	35	28	4,813	35	24	23	3,262	25	59	26	8,075	30
SAR	14	11	2,928	21	15	15	3,653	28	29	13	6,581	24
LCR	21	17	2,763	20	19	18	2,017	15	40	17	4,780	18
AFR	18	14	1,290	9	23	22	2,253	17	41	18	3,543	13
ECA	32	25	1,902	14	15	15	1,363	10	47	21	3,266	12
MNA	6	5	192	1	7	7	584	4	13	6	775	3
Total	**126**	**100**	**13,889**	**100**	**103**	**100**	**13,131**	**100**	**229**	**100**	**27,020**	**100**

Source: World Bank data

5.2 Over the past decade, TSB-managed transport *commitments* in the Africa (AFR) and South Asia (SAR) regions have risen dramatically, while they have declined in other large regions. The Africa region is in fact the only region with a significant increase in the *number* of transport projects approved; there was a significant drop in the number approved in the East Asia and Pacific (EAP) and Eastern Europe and Central Asia (ECA) regions, while the number remained more or less unchanged elsewhere. The highest commitments in the last five years were in the SAR and EAP regions at 28 and 25 percent, respectively, followed by AFR with 17 percent. EAP and AFR had the greatest share of projects (23 and 22 percent, respectively) followed by the Latin America and Caribbean (LCR) region (18 percent).

5.3 Moreover, from Table 5.2 it can be seen that transport lending has been predominantly to low-income (LIC) and lower-middle income (LMIC) countries and that over time the percentage of commitments to upper-middle income (UMIC) countries has declined to just 12 percent.

[38] In practice, the percentage of roads may be as high as 80 percent because urban roads and streets are classified under general transport.

Table 5.2 : TSB-managed projects and commitments approved in FY97-06, by country income group

Country income group	FY97-01				FY02-06				Total: FY97-06			
	Projects		Commitments		Projects		Commitments		Projects		Commitments	
	Nbr	(%)	US$m	(%)	Nbr	(%)	US$m	(%)	Nbr	(%)	US$m	(%)
LIC	47	37	5,085	37	42	41	6,215	47	89	39	11,300	42
LMIC	55	44	5,890	42	48	47	5,344	41	103	45	11,234	42
UMIC	24	19	2,913	21	13	13	1,573	12	37	16	4,487	17
Total	**126**	**100**	**13,889**	**100**	**103**	**100**	**13,131**	**100**	**229**	**100**	**27,020**	**100**

Source: World Bank data

A. APPROVED PROJECTS

Anticipated health benefits

5.4 **About a quarter of all TSB projects (28 percent) approved from FY97-06 justified themselves (at least partially) by health benefits or by mitigating or preventing a health hazard** (Table 5.3). The share of projects justified by health benefits or reduction in health risks has risen over time, from 26 to 31 percent. The cited benefits for the most recent five-year period also show greater diversity. Overwhelmingly, the benefits cited most frequently were safety-related, and of these the majority indicated an expected improvement in road safety, with a few related to improved safety in other transport modes. The remaining projects were either focused on improvements in air quality due to a reduction in harmful vehicle emissions, or on the prevention of the transmission of HIV/AIDS along road transport corridors by truck drivers.

Table 5.3: TSB-managed projects approved in FY97-06 justified by health benefits

Project justified by health benefits/mitigation of health risks?	FY97-01		FY02-06		Total, FY97-06	
	Number of Projects	(%)	Number of Projects	(%)	Number of Projects	(%)
Yes	**33**	**26.2**	**32**	**31.1**	**65**	**28.4**
Of which:						
Improved Road Safety	30	23.8	27	26.2	57	24.9
HIV/AIDS Prevention	2	1.6	6	5.8	8	3.5
Air Quality	2	1.6	4	3.9	6	2.6
Public Transport Safety	0	0.0	1	1.0	1	0.4
Waterway Safety	1	0.8	0	0.0	1	0.4
No	93	73.8	71	68.9	164	71.6
Total Projects	**126**		**103**		**229**	

Note: The number of justifications exceeds the number of projects because in some cases more than one benefit is cited.

Explicit objectives to improve health outcomes

5.5 **Just under a quarter of TSB-managed projects in the review period had explicit objectives to improve health outcomes** (Table 5.4). Again, the number of road safety projects predominates. There was no statistically significant difference between the

period FY97-01 (23.0 percent) and FY02-06 (25.2 percent), showing that the incidence of health objectives has been roughly unchanged. [39]

Table 5.4: TSB-managed projects with explicit objectives to improve health outcomes (FY97-FY06)

	FY97-01		FY02-06		Total, FY97-06	
Explicit objectives to improve health outcomes/mitigate health risks?	**Number of Projects**	**(%)**	**Number of Projects**	**(%)**	**Number of Projects**	**(%)**
Yes	**29**	**23.0**	**26**	**25.2**	**55**	**24.0**
Of which:						
Improve road safety, *of which*	27	21.4	18	17.5	45	19.7
Reduce the rate of accidents, injury, and death associated with road transport	1	0.8	5	4.9	6	2.6
Improvement of safety at selected accident "black spots"	0	0.0	2	1.9	2	0.9
Development of institutional capacity for road safety[a]	3	2.4	5	4.9	8	3.5
Establishing a safer public transport system	0	0.0	1	1.0	1	0.4
Improve aviation safety	0	0.0	2	1.9	2	0.9
Improve waterway safety	1	0.8	0	0.0	1	0.4
HIV/AIDS prevention	0	0.0	1	1.0	1	0.4
Enhance social inclusion through improved access to health facilities[b]	0	0.0	1	1.0	1	0.4
Improve air quality.	0	0.0	1	1.0	1	0.4
No	**97**	**77.0**	**77**	**74.8**	**174**	**76.0**
Total Projects	**126**		**103**		**229**	

Note: The number of objectives exceeds the number of projects because in some cases more than one objective is cited.

a. Of these projects, four had objectives exclusively focused on improved management or institutional capacity of the road safety program, with no explicit objective of improving road safety

b. Chile Santiago Urban Transport Project

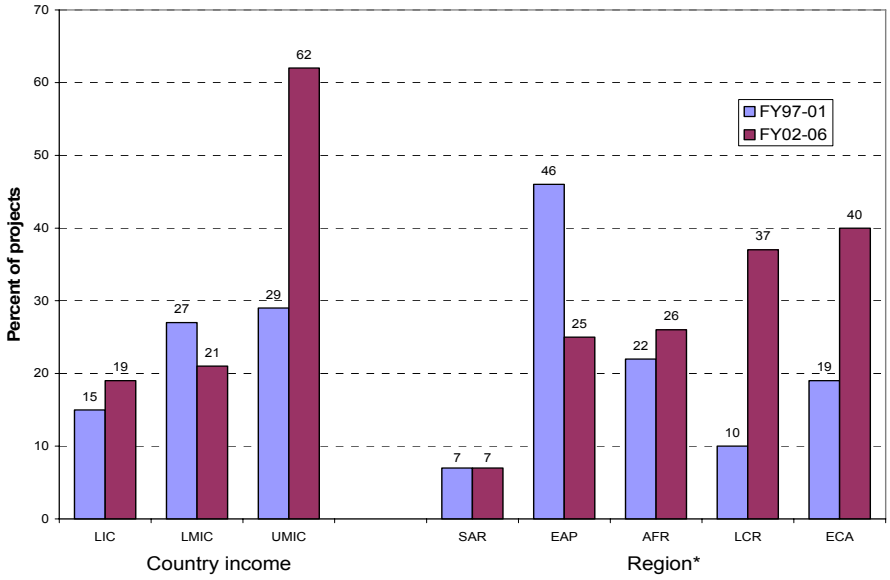
5.6 The share of projects citing health benefits and the share with explicit health objectives is not much different – 28 vs. 24 percent, respectively, over the whole period (Tables 5.3 and 5.4). However, certain types of benefits are less likely to appear as explicit objectives and others more so. For example, while appraisal reports for 8 projects referred to the benefits of HIV/AIDS prevention, only in one case did this become a formal objective. Similarly, in only one instance does air quality become an explicit objective, although mentioned as a benefit in appraisal documents for 6 projects. Conversely, aviation safety does not feature in the benefits table based on appraisal information, yet a formal objective appears in a project.

5.7 **The likelihood that TSB projects have a health objective rises with country income** (Annex 2). Projects in UMIC were much more likely to have a health objective (41 percent) than in LMIC or LIC (24 and 17 percent, respectively). While the share of

[39] The objective of improving access to health care is not included in the table, as virtually any road would be expected to contribute to improved physical access to health and a host of other services; better access may or may not improve health outcomes. There were only three such projects with explicit objectives of improving access to health care: *Chile Santiago Urban Transport Adjustment* (2006), *Albania Road Maintenance Project* (2002), *and Guinea National Rural Infrastructure* (2005).

projects with health objectives in LMIC and LIC remained constant over the decade, there was a marked increase in the share of UMIC with health objectives (Figure 5.1).

Figure 5.1: Trend in the share of projects with explicit health objectives, by country income and region



Note: MNA had no projects with explicit health objectives.
Source: Annex 2

5.8 **TSB projects in East Asia and the Pacific region are the most likely to have a health objective** (37 percent)[40], and in SAR and MNA the least likely (7 and 0 percent, respectively, Annex 2).[41] The share of TSB projects with explicit health objectives has risen over time in ECA and LCR (Figure 5.1). It would thus appear that road safety, despite its importance, is accorded less priority in some regions.

Project components with plausible health benefits

5.9 **While only about a quarter of TSB-managed transport projects have an explicit health objective, nearly half (46 percent) have components or activities with potential health benefits** (Table 5.5). The share with health components has increased over time – from 36 percent in the first half of the decade to 59 percent more recently.

5.10 In fact, forty-two percent of TSB projects had *transport safety components*, including activities such as improving management of traffic or road safety,[42] improving

[40] Within EAP projects in China predominate, with 53 percent of the projects and 70 percent of financial commitments. Substantially more Chinese projects also have health objectives, 77 percent compared with 23 percent for the rest of EAP.
[41] This explains in part why 40 percent of all TSB projects with health objectives are in EAP.
[42] These components could include training, setting up coordinating bodies, improving traffic legislation, improving enforcement capability, streamlining road safety into road work design, and improving response to assist at the accident scene and to ensure injured persons receive emergency treatment.

hazardous sections, improving accident data collection or analysis.[43] All but a handful of projects with these safety components were for road safety; a few projects had components related to port and inland waterway safety, aviation safety and safety on public transport. None of the safety components explicitly mentioned behavior change. The share of projects with transport safety components has risen dramatically over the 10-year period, from 33 percent in FY97-01 to 52 percent in FY02-06. The total value of the road safety components is in the order of $414 million.

Table 5.5: Health Related Components Supported by TSB Projects approved, FY97-06

	FY97-01		FY02-06		Total	
Did the project finance any health components?	**Number of Projects**	**(%)**	**Number of Projects**	**(%)**	**Number of Projects**	**(%)**
Yes	**45**	**35.7**	**61**	**59.2**	**106**	**46.3**
Of which						
Any safety component	42	33.3	53	51.5	95	41.5
•Traffic management	37	29.4	35	34.0	72	31.4
• Road safety management	33	26.2	35	34.0	68	29.7
• Improvement of hazardous sections	21	16.7	21	20.4	42	18.3
• Accident data collection/analysis	15	11.9	16	15.5	31	13.5
• Port safety	1	0.8	1	1.0	2	0.9
• Aviation safety	0	0.0	2	1.9	2	0.9
• Railway safety	0	0.0	1	1.0	1	0.4
• Inland waterway security	1	0.8	0	0.0	1	0.4
HIV/AIDS prevention	4	3.2	15	14.6	19	8.3
Air quality	7	5.6	2	1.9	9	3.9
Rehabilitation of health centers[a]	0	0.0	1	1.0	1	0.4
No	**81**	**64.3**	**42**	**40.8**	**123**	**53.7**
Total Projects	**126**		**103**		**229**	

a. No components were identified that involved building health facilities, but three components mentioned the improvement of emergency services and response time.

5.11 About 8 percent of all projects had components for *HIV/AIDS prevention*, substantially higher than the share with explicit objectives on HIV/AIDS. Components in this category include assistance with the formulation of an appropriate policy, the distribution of condoms and AIDS prevention material to transport workers, counseling assistance to roadside populations and road workers including at border crossings on the prevention of HIV/AIDS, and identification of health centers where HIV/AIDS related health services can be strengthened. The share of projects with HIV/AIDS components has increased over time, from only 3 percent of projects in the first half of the decade to 15 percent in the second half. In fact, this may be an undercount, as Table 5.5 is based only on review of appraisal documents and excludes components that were added after

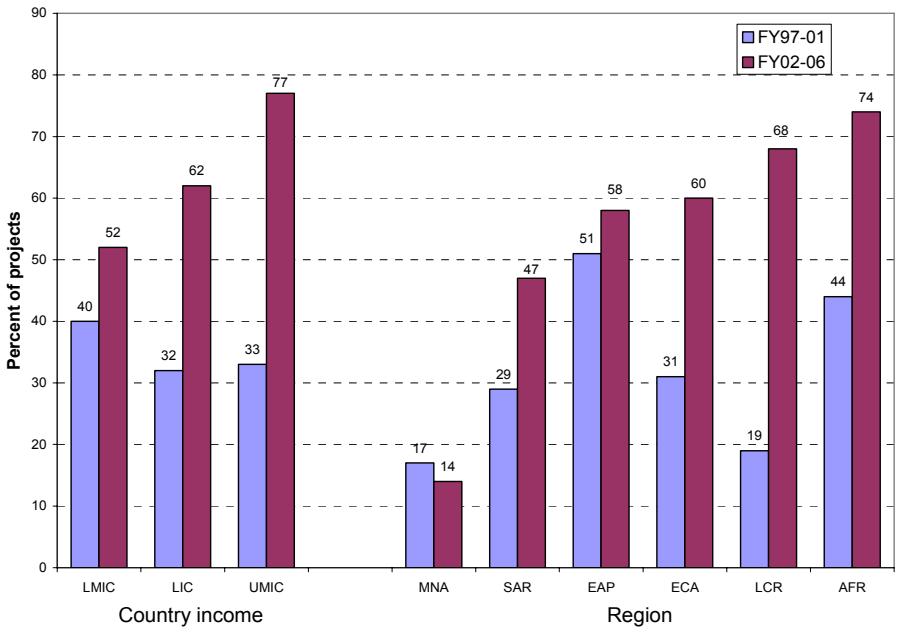
[43] This includes setting up of systems to record and analyze information about road accidents including data capturing, definitions, and analysis. Since not all fatalities occur at the scene of an accident and some people die of their injuries some time later, rules need to be set about what to include in the accident data.

appraisal.[44] About two-thirds of the 19 projects with HIV/AIDS prevention components are in Sub-Saharan Africa. The HIV/AIDS prevention components over the 10-year period amounted to about $8 million in commitments.

5.12 Only 4 percent of TSB-managed projects had components to *improve air quality*. They involved the development of a motor vehicle emission control strategy, the implementation and supervision of an urban air quality management strategy, and equipment and training for vehicle inspections.[45]

5.13 There has been a leap in the share of TSB projects with health components in countries of all income levels and all regions, except MNA (Figure 5.2). The greatest increase has been among LICs and LMICs, and in three regions – LCR (from 19 to 68 percent), ECA (from 31 to 60 percent), and AFR (from 44 to 74 percent). [46]

Figure 5.2: Trend in the share of projects with health components, by country income and region



5.14 **Altogether, half of all TSB projects in the past decade have had a health focus, defined as those that anticipated health benefits, had explicit health objectives, or including components with plausible health benefits (**Table 5.6)**.** The

[44] IEG's 2005 evaluation of the Bank's support for HIV/AIDS control identified16 transport projects approved between FY97-04 that had incorporated HIV/AIDS activities, of which 13 were in Sub-Saharan Africa (OED 2005, p. 115, 117). Among the 24 African countries that had approved MAP projects by mid-2004, half also had projects managed by the transport sector that had HIV/AIDS components (Ibid, p. 157).
[45] This is an understatement of the number of projects with emissions components, as most are managed by other sectors.
[46] Over the 10-year period, nearly half of projects in low and middle-income countries have health components, but there are differences across regions. More than half of TSB projects in AFR (61 percent) and EAP (54 percent) have health components, compared with about 40 percent in ECA, LCR, and SAR, but only 15 percent in MNA. See Annex 2.

share with a health focus in the past five years (two-thirds), is nearly twice the share of projects in the first five years with a health focus (37 percent). This parallels the Bank's increased awareness, especially of road safety issues, resulting from the collaborative work with the WHO issued in 2004.

Table 5.6: TSB-managed Projects with a Health Focus (FY97-FY06)

	FY97-01		FY02-06		Total	
	Number of Projects	(%)	Number of Projects	(%)	Number of Projects	(%)
Projects with a health focus	**47**	**37**	**69**	**67**	**116**	**51**
Safety	44	35	59	57	103	45
HIV/AIDS Prevention	4	3	15	15	19	8
Air quality improvement	7	6	5	5	12	5
Projects without a health focus	**79**	**63**	**34**	**33**	**113**	**49**
Total projects	**126**		**103**		**229**	

Inclusion of health benefits and costs in the economic analysis

5.15 **The health benefits of transport projects were usually not reflected in the project's *ex ante* economic analysis.** About 17 percent of the 116 projects with a health focus included health benefits in the calculation of economic benefits (Table 5.7), and all were road-safety related. The benefits were mainly defined in terms of a reduction in injuries, death, and property damage due to a reduction in accidents. Three-quarters of the projects with a health focus that did not include health benefits in the economic analysis did not explain why they were excluded. **None of the 126 transport projects without safety components factored in any *adverse* health outcomes in their economic analysis**.

Table 5.7: Among TSB Projects with a health focus, inclusion of health benefits in *ex ante* economic analysis

Did project have an economic analysis (ERR, NPV, CE analysis)?	FY97-01 No.	FY97-01 (%)	FY02-06 No.	FY02-06 (%)	Total No.	Total (%)
Yes, *of which:*	**46**	**98**	**67**	**97**	**113**	**97**
Projects that included health benefits in ERR/NPV/CE analysis	**9**	**19**	**11**	**16**	**20**	**17**
Assumptions on health benefits are explicit	*7*	15	*5*	7	12	10
Health benefits defined as:						
Cost savings due to reduction in accidents	8	17	11	16	19	16
- Imputed value of life	4	9	1	1	5	4
- Cost of injury	3	6	1	1	4	3
- Reduction in property damage	1	2	1	1	2	2
Reduction in accidents	5	11	0	0	5	4
Reduction in number of deaths	1	2	0	0	1	1
Projects that excluded health benefits in ERR calculation	**37**	**79**	**56**	**81**	**93**	**80**
Reasons for excluding health benefits:						
Reasons not discussed	24	51	42	61	66	57
Lack of data	12	26	11	16	23	20
Safety impacts uncertain	6	13	3	4	9	8
Benefits from the component cannot be calculated because subprojects have not been identified	1	2	1	1	2	2
No economic analysis.	**1**	**2**	**2**	**3**	**3**	**3**
Total TSB Projects with health focus	**47**		**69**		**116**	

Health indicators

5.16 **About a quarter of the TSB projects proposed to collect health <u>outcome</u> indicators (Table 5.8), roughly the same share as had health objectives**. The road safety outcome indicators included the number of accidents, injuries, and fatalities, and accident, injury, and fatality rates. Other indicators included access time to health care facilities, HIV/AIDS awareness, and emission control. *No projects proposed to collect health indicators specifically among the poor.*

Table 5.8: TSB-managed Projects Proposing to Collect Health Outcome Indicators (FY97-06)

Proposes to collect health outcome indicators	FY97-01		FY02-06		Total FY 97-06	
	Number of Projects	(%)	Number of Projects	(%)	Number of Projects	(%)
Yes	**29**	**23.0**	**31**	**30.1**	**60**	**26.2**
Number of accidents	10	7.9	9	8.7	19	8.3
Severity of accidents	1	0.8	3	2.9	4	1.7
Number of fatalities	9	7.1	9	8.7	18	7.9
Number of injuries	3	2.4	0	0.0	3	1.3
Accident rate	5	4.0	6	5.8	11	4.8
Fatality rate	11	8.7	10	9.7	21	9.2
Injury rate	1	0.8	2	1.9	3	1.3
Number of fines for drunk driving, speeding.	0	0.0	1	1.0	1	0.4
HIV/AIDS awareness	0	0.0	2	1.9	2	0.9
Travel time to health facilities	0	0.0	2	1.9	2	0.9
Use of health services (# clinic visits by groups, gender)	0	0.0	1	1.0	1	0.4
Access of transport officials to HIV/AIDS treatments	0	0.0	1	1.0	1	0.4
Use of condoms	0	0.0	1	1.0	1	0.4
No	**97**	**77.0**	**72**	**69.9**	**169**	**73.8**
Total Number of Projects	**126**		**103**		**229**	

5.17 **Even fewer projects – only one in 20, or 5 percent – planned to collect health <u>output</u> indicators** (Table 5.9). This is significant, because without information on project outputs related to transport safety or health activities, it is difficult to confidently attribute any change in health status or accident rates to the interventions of the project.

Table 5.9: TSB Projects Proposing to Collect Health Output Indicators (FY97-06)

Proposes to collect health output indicators	FY97-01		FY02-06		Total FY 97-06	
	Number of Projects	(%)	Number of Projects	(%)	Number of Projects	(%)
Yes	**5**	**4.0**	**6**	**6.0**	**11**	**4.8**
Number of road safety campaigns	1	0.8	0	0.0	1	0.4
No. of traffic signs/signals installed; no. of road safety hazard sites treated; line markings.	4	3.2	3	2.9	7	3.1
Number HIV/AIDS awareness campaigns	0	0.0	2	1.9	2	0.9
Greenhouse gas emissions	0	0.0	1	1.0	1	0.4
No	**121**	**96.0**	**97**	**94.2**	**218**	**95.2**
Total projects	**126**		**103**		**229**	

B. CLOSED PROJECTS

5.18 **Among the 105 completed projects (as of June 25, 2007), only 28 (27 percent) had a health focus** – that is, had explicit health objectives and/or components with potential health benefits.[47] The list of these projects, their health objectives, benefits, components, and indicators, and evidence of changes in health outcomes, are provided in Annex 3. All except one were approved in the first five years of the period under review (FY97-01).

Implementation of health components

5.19 All 28 completed projects with a health focus had health components – although for three projects, health components were added after approval.[48] Most health-related components involved road safety, including improvement of hazardous sections (accident black spots improvement), implementation of traffic measures (lane markings, crash barriers, reflective studs, traffic signs/lights), improving road safety management, or setting up functioning accident data systems (Table 5.10). Safety components for other modes were comparatively rare. In most cases the roads under improvement were rehabilitated roads, but in a few instances (mainly in China) the roads were newly constructed highways. In most cases of new construction the reduction in the accident rate in comparison to the rate on the original "old" road was significant. Only in the case of the National Highway III project in Hubei Province was this questioned when it was noted that while the absolute number of accidents had declined, the fatality rate had actually increased, suggesting that there was a higher likelihood of death associated with higher speeds.

5.20 In a few cases there was an attempt to adopt a comprehensive approach to road safety improvement. For example, in Latvia a new Road Traffic Law was promulgated and a company was set up to deal with the issuing of drivers licenses and the testing of vehicles. In Lithuania, there were traffic safety campaigns, an improved accident reporting system was established, and road safety education for school children was introduced into the curriculum. On the other hand, in Zambia a Road Safety Action Plan could not be pursued because of lack of capacity and in Togo an Office of Road Safety was established, but did not become operational because of budgetary constraints.

5.21 **All of the planned physical road safety components, as well as waterway and port safety components were at least partially implemented**. However, components relating to traffic management, road safety management and accident data collection were less likely to be implemented, with the lowest implementation rate (only 25 percent) for components to improve air quality.

5.22 **In contrast, more HIV/AIDS components were implemented than had been planned.** Projects in Ethiopia, Malawi, and Niger implemented HIV/AIDS prevention

[47] Closed projects with Implementation Completion Reports (ICR) available for assessment

[48] An HIV/AIDS component was added to the Ethiopia Road Sector Development Program Support Project and the Niger Transport Infrastructure Rehabilitation Project after approval. (The latter already had a road safety component.) Road safety was added to the India Andhra Pradesh State Highway Project.

components. In Malawi, the National Roads Administration held a sensitization workshop for the senior management in the transport sector. The Implementation Completion Report (ICR) notes that HIV/AIDS activities are now part of tender documents for major development partner funded projects, but it does not specify which activities. The Ethiopia Road Sector Development Program Support Project initiated an HIV/AIDS strategy for the transport sector. The target groups were the staff of the Ethiopian Roads Administration, contractors, consultants and local communities at the project sites. The Niger Transport Infrastructure Rehabilitation Project implemented an information, education and communications program to reduce the risk of HIV/AIDS along transport corridors and among transport workers.

Table 5.10: Planned and implemented health-related components in closed TSB projects (approved in FY97-06)

Type of health component	Number of projects with planned health components	Number of projects that implemented health components[a]	Actual/ Planned (%)
Any safety component[b]	**23**	**23**	**100**
Improvement of hazardous sections	12	12	100
Traffic management	20	15	75
Road safety management	18	16	89
Accident data collection/analysis	9	7	78
Inland waterway safety	1	1	100
Port safety	1	1	100
Air quality component	**4**	**1**	**25**
HIV/AIDS components	**1**	**3**	**300**
Total – Any health component	**26**	**28**	

a. Includes components that were fully or partially implemented. In many cases, the lack of reported output indicators for the health components made it difficult to assess the extent to which they were fully implemented.
b. Among the projects approved in FY97-06, none with planned railway or aviation safety components had been completed.

Inclusion of health benefits in ex post economic analysis

5.23 Of the twenty projects that included health benefits in their ex ante economic analysis at the time of appraisal, only four have closed for which ICRs have been prepared. Only one of these projects, the China Anhui Provincial Highway Project (approved in FY99) included health benefits in the economic analysis. While the ICR for one project (Romania Second Roads, approved in FY97) gave no reason for the omission of health benefits in its ex post economic analysis, the ICRs for the other two (Latvia Highways and Lithuania Highways Projects, both FY97) explained that the actual net present values and economic rates of return for the road safety component cannot be calculated yet because there has not been enough time to observe the results of the black spot improvements in terms of reduced accidents.

Collection of health indicators

5.24 **Projects with explicit health objectives were far more likely to plan to collect health outcome data and to actually collect it, than were projects with health**

components absent these objectives. Of the eighteen projects with explicit objectives to improve health outcomes, twelve (two-thirds) intended to collect health outcome data (Table 5.11). Ten of those that planned to collect health outcome data actually collected it, as did three other projects that had not planned to collect it. Among the ten additional projects with health components in the absence of explicit health objectives, only two planned to collect health outcome data and only one project actually did so. Another project which did not plan to collect data on health outcomes actually did collect it. All of these projects collected health outcome data related to road safety improvements such as the accident rate/fatality rate. None of the projects with HIV/AIDS components collected data on HIV/AIDS outcomes (including proxy indicators, like behavior change).[49]

Table 5.11: Health outcome indicators – planned and collected

Type of health focus	Planned to collect health outcomes		Actually collected health outcomes		Total	
	Number	%	Number	%	Number	%
Projects w/explicit health objective	12	67	13	72	18	100
Projects w/health component, no objective	2	20	2	20	10	100
Total	**14**	**50**	**15**	**53**	**28**	**100**

Source: Annex 3.

Changes in health outcomes

5.25 **All fifteen TSB-managed projects that measured health outcomes had to do with transport safety** – 13 with road safety, one with the safety of inland waterways, and one with the safety of public transport. The 13 road safety projects were concentrated in two regions – East Asia (five projects, all of them in China) and Eastern Europe (five projects). In addition, there were two projects that measured health outcomes in South Asia (Bangladesh, India) and only one project in the Africa Region (Zambia). Thus, the vast majority of projects reporting changes in health outcomes are in middle-income countries.[50]

5.26 **In all but Zambia, the indicators suggest an improvement in road safety,** although it is not clear whether all of these improvements are statistically significant (Table 5.12). Although it was not an explicit objective, the Zambia Road Sector Investment Program aimed to reduce road accidents by 20 percent. However, the number of accidents and fatalities actually increased, despite the establishment of a Road

[49] This lack of data on the outcomes of HIV/AIDS components in transport projects mirrors the experience of transport components in HIV/AIDS projects. Among five recently completed HIV/AIDS projects managed by the health sector with activities aimed at transport workers or Ministry of Transport civil service, none reported baseline or end-point data on risk behavior or condom use among transport workers. In none of the ICRs of closed projects was information provided on the impact of the transport sector interventions. The only achievements reported tend to be process indicators or planning activities (Portfolio Review, IEG evaluation of HNP). A recent review of Bank-supported HIV/AIDS interventions in the Africa transport sector came to the same conclusion – that M&E were largely absent (do Sacramento)

[50] As noted earlier, projects in middle-income countries were more likely to have an explicit health objective and those with objectives are more likely to collect data on outcomes.

Transport and Safety Agency (RTSA), responsible for road safety, traffic management, and motor vehicle licensing.[51]

5.27 Accidents were also reduced in inland waterways in Vietnam and in public transit in urban Senegal.[52] No TSB-managed projects approved in FY97-06 that had closed documented improvements in HIV/AIDS outcomes or in air quality. A groundbreaking TSB-managed project in Mexico approved prior to the period under review showed a reduction of transport emissions (Box 5-1).

Box 5-1: Reducing Harmful Emissions

The $220 million Mexico Transport Air Quality Management Project (FY93-99) aimed to reduce high vehicle emissions in the Mexico City Metropolitan Area and was the first Bank operation anywhere to integrate transport and air quality. The project involved revising emissions standards, stricter vehicle inspections, replacement of old vehicles, gasoline vapor recovery, an alternate fuel pilot, preparation of a Transport and Air Quality Management Strategy, procurement of scientific equipment for better air quality measurement, and technical assistance for improved monitoring and environmental audits.

In-depth field work by IEG found that despite an increasing number of vehicles and traffic, there was a significant decrease in the ambient concentration of pollutants from vehicle operations and emissions. Over the project period, there were reductions in lead (by 98 percent), ozone (by 48 percent), and carbon monoxide (by 27 percent). The decline in ozone levels reduced the number of "pollution emergency days", from 103 days/year in 1993 to 13 in 2001, and contributed to fewer respiratory illnesses and other acute syndromes due to poor air quality.

Source: OED 2003.

[51] The ICR suggests that the Road Safety Action Plan was developed, but its actions were not effective due to a lack of capacity. The project procured traffic patrol vehicles, road safety education, publicity materials, speed traps, and first aid kits.

[52] The decline in accidents by 4 percent in Senegal may not have been statistically significant, however.

Table 5.12: Improvements in transport safety among completed projects

Country	Indicator	Baseline	Year	Final	Year	Target	Year
Road safety results							
Armenia (P040818)	Road fatalities/10,000 vehicles	12.1	1999	10.5	2004	11.0	2004
Bangladesh (P037294)	Road fatalities/10,000 vehicles	76	1998	60	2005	50	2005
China (Xinjiang) (P003643)	Accidents w/fatalities/10,000 vehicles	25	1999	21	2003	19	2005
China (Hunan) (P003654)	Accidents w/fatalities/10,000 registered vehicles	18	1999	5	2003	10	2005
(Guangdong)	Accidents w/fatalities/10,000 registered vehicles	20	1999	12	2003	10	2005
China (Hubei) (P036949)	Accidents w/fatalities/10,000 vehicles	40	1998	12	2003	25	2005
China (Anhui) (P050036)	Accidents per 100 million vehicles along National Highway G206	124	1998	56	2005	None	
China (Liaoning) (P041890)	Pedestrian and bicycle accidents	6,498[a]	1998	2,948[a]	2004	15% reduction	
	Pedestrian and bicycle fatalities	897[a]	1998	698[a]	2004	15% reduction	
India (P000755)	Fatalities per 10,000 vehicles	52	1999	39	2003	None	
Latvia (P008532)	Fatalities per 10,000 vehicles	19.9	1995	8.4	2000	20% reduction	
Lithuania (P008551)	Fatalities per 10,000 vehicles	7.5	1996	6.6	1999	20% reduction	
Poland (P008593)	Reduction in road crashes	66,586	1997	51,069	2004	None	
	Reduction in road fatalities	7,310	1997	5,712	2004	None	
Romania (P039250)	Fatalities per 10,000 vehicles	9.2	1997	5.8	2003	None	
	Seriously injured people	7,451	1997	5,538	2003	None	
Zambia (P003236)	Annual road accidents	8,200	1998	9,588	2005	7,000	2005
	Annual fatalities	870	1998	1,046	2005	750	2005
Inland waterway safety							
Vietnam (P004843)	Accidents per 100 vessels	0.0034	2000	0.0023	2005	None	
Safety of public transport							
Senegal (P044383)	Number of accidents by public transport in sub-urban areas	2318	1995	2225[b]	2000	20% reduction by 2000	

Notes: a. According to the ICR, these data are not specific to the areas where the project was implemented, so attribution is questionable. b. The number of accidents involving public transport declined by 4 percent.
Source: Annex 3.

5.28 **While reported health outcomes almost universally improved in these projects, the attribution of outcomes to the projects' outputs was not always clear**. In most cases it is plausible that the project interventions and the safety improvements were directly linked, but attribution was often weak due to: (a) inadequate documentation of outputs; (b) failure to consider other factors that might have affected accident reductions (for example, fuel prices, which can affect the amount of driving and the miles traveled); and (c) a lack of specificity of the data to the areas covered by the project interventions.[53] On the other hand, to the extent that the projects improved the reporting of transport accidents, injuries, and fatalities, these statistics may in fact understate the impact of improved safety measures.

6. CONCLUSIONS

6.1 The distribution of TSB projects varies according to region and country income level, but only fifteen projects among the 28 closed projects with a health focus actually measured health outcomes. Health objectives are most likely in EAP, but least likely in MNA. In general the likelihood that a project will include a health objective rises with country income and projects with specific health objectives are more likely to identify health outcome data needs and to actually collect such data. There have been more transport projects with health components in recent years; the emphasis of the updated Bank transport sector strategy and joint initiatives with the WHO and others may have influenced this trend.

6.2 This review of health benefits in the transport lending portfolio over the past decade shows that in the majority of the cases the focus has been on improvements in road safety, as measured by a reduction in the fatality or injury rates. Among the 55 projects with health-related objectives, 82 percent had objectives to improve road safety, while only 7 percent had objectives to improve safety of other modes of transport and only 2 percent each had HIV/AIDS prevention or air quality improvement objectives.

6.3 Clearly, any road project that leads to faster travel speeds also has the potential to increase the severity of accidents that occur. Consequently, it would be sensible for all road projects during appraisal to address this issue and that any mitigation measures proposed should be implemented and monitored. This appears to be a major weakness in Bank evaluation procedures and tools—a point recognized by the Transport Anchor.

6.4 Many road safety interventions supported by the Bank were limited in scope to a reduction in the accident rate on specific stretches of infrastructure under improvement and likely to have only localized benefits[54]. This is because road safety was often an add-

[53] Lack of specificity was an issue in China Liaoning Urban Transport Project (P041890). According to the ICR there was a reduction in accidents in all three cities (Fushun, Anshan, and Shenyang) but it was not location specific and therefore not completely attributable to the project.
[54] Some exceptions include certain projects in China where a more comprehensive approach was used.

on component to a road construction or rehabilitation project and not designed to improve overall road safety.[55]

6.5 Although a reduction in road traffic accidents is used as an indicator to demonstrate the result of road safety countermeasures, there is an attribution problem, since such improvements can also be due to other factors. The attribution of outcomes to the projects' outputs is not always clear. The lack of reported output and outcome indicators for the health components of closed TSB-managed projects makes it difficult to assess the extent to which they are fully implemented. Measuring the benefits remains a problem, because of the inadequacy of proper accident reporting systems in many countries. The quality and reliability of data vary between surveillance systems in different countries and even between systems in the same country.[56] Where basic data are not available, community surveys have sometimes been conducted as a proxy (e.g., Ghana, Pakistan, and Uganda). The updated transport sector strategy (close to finalization) acknowledges the need for better monitoring and evaluation.

6.6 Not one of the completed transport projects with HIV/AIDS components have reported on HIV/AIDS outcomes or proxies for them. Thus it is not possible to say whether any of the HIV/AIDS activities or interventions included in transport projects was effective. A recent update on the implementation of the World Bank's *Global HIV/AIDS Program of Action*[57] notes that more than half of the projects in the current transport lending portfolio now incorporate HIV/AIDS activities, yet the update provides no evidence of their effectiveness in improving health outcomes, including healthier behavior.[58] Most of these HIV/AIDS components were 'retro-fitted' into projects after they were approved, thus HIV/AIDS related outcomes are not included as an explicit objective. As seen in the case of road safety projects, projects without an explicit health (or in this case HIV) objective are far less likely to collect health outcome data.

6.7 The portfolio review has pointed to a number of interesting patterns, but the reasons behind them and how performance can be improved remain unclear. The next step would be to learn more on the "why" and "how" by follow-up interviews with transport staff, as the basis for recommending how the performance of health components of transport projects can be improved. Among the remaining questions:

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[55] In the Malawi Road Rehabilitation and Maintenance Project, for example, road safety and HIV/AIDS activities were added on during implementation.

[56] WHO 2004 Only 75 countries fully capture the necessary data, while a further 35 submit incomplete data. Some of the poorest countries have no workable recording systems.

[57] World Bank Human Development Network, 2007 According to Annex 3, p. 56, twenty-five of the 39 projects in the current transport sector portfolio includes HIV activities.

[58] OED's 2005 evaluation of the Bank's HIV/AIDS support found that among 16 ongoing transport projects with HIV/AIDS components, only one mentioned AIDS in its development objectives, four reported the status of AIDS activities in supervision reports, and five had AIDS indicators. When activities are "retro-fitted" into an ongoing project, there is often little documentation of the objectives or performance when the project closes. The activities are rarely large enough to become a formal component. Supervision resources are often too tight to be able to enlist a technical expert for these small and specialized activities for which the sector itself has little expertise.

- Why, if there are so many projects with transport safety and HIV/AIDS components, do so few of them: (a) have explicit objectives on transport safety and HIV/AIDS; and (b) propose to collect data to document whether safety/health improves or risks are mitigated?

- Among TSB projects with explicit health objectives, what accounts for the fact that some succeed in reporting health outcomes and others do not? Are there important operational linkages between the transport and health sectors that are key? Are the statistics being collected from within the transport sector, or in collaboration with health or local government?

- On the issue of improving attribution of outcomes to the project, (a) Why do so few projects propose to collect health outputs? (b) What additional information can be taken into consideration to improve attribution?

- Why do so many fewer TSB projects in low-income countries have health components and objectives?

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ANNEX 1. LIST OF PROJECTS REVIEWED

Project ID	Project Name	Country	Appro-val FY	Closing Date	Health Focus	Loan/Credit Amount (US$M)
P005980	Provincial Roads	Argentina	1997	06/30/2006		300
P039584	Buenos Aires Urban Transport	Argentina	1997	06/30/2010	✓	200
P009518	Second Rural Roads & Markets Improvement	Bangladesh	1997	03/31/2003		133
P000117	Transport Sector Investment Program	Benin	1997	12/31/2001	✓	40
P044393	Emergency Landmine Clearance	Bosnia and Herzegovina	1997	12/31/1998		8
P006532	Federal Highway Decentralization	Brazil	1997	12/17/2005		300
P034578	RGS Highway Management	Brazil	1997	12/15/2005		70
P003643	Second Xinjiang Highway	China	1997	12/31/2003	✓	300
P003654	National Highway 2/Hunan-Guangdong	China	1997	12/31/2004	✓	400
P044457	Emergency Transport/Mine Clearance	Croatia	1997	12/31/2001		102
P035722	National Highway	Dominican Republic	1997	10/31/2003	✓	75
P044651	Road Sector Engineering	Eritrea	1997	06/30/2002		6
P009995	Andhra Pradesh State Highway	India	1997	06/30/2004	✓	350
P045600	Road Infrastructure Development	India	1997	12/31/2001		52
P004026	Railway Efficiency	Indonesia	1997	12/30/2004		105
P040521	Village Infrastructure II	Indonesia	1997	07/31/2000		140
P004210	Third Highway Improvement	Lao PDR	1997	06/30/2003		48
P008532	Highway	Latvia	1997	12/31/2000	✓	20
P038674	National Roads	Lebanon	1997	09/30/2004		42
P008551	Highway	Lithuania	1997	12/31/2000	✓	19
P036061	Port Access & Management	Poland	1997	06/30/2003		67
P039250	Roads 2	Romania	1997	06/30/2006	✓	150
P044383	Urban Transport Reform TA	Senegal	1997	06/30/2001	✓	7
P034083	Urban Transport	Turkmenistan	1997	12/31/2001		34
P039203	Forests Product Transport	Uruguay	1997	04/30/2006		76
P004842	Second Highway Rehabilitation	Vietnam	1997	06/30/2003	✓	196
P039021	Rural Transport	Vietnam	1997	12/31/2001		55
P040818	Durres Port	Albania	1998	12/31/2004	✓	17
P052590	National Highway Rehabilitation & Maintenance	Argentina	1998	12/31/2005		450
P045484	Second Emergency Transport Reconstruction	Bosnia and Herzegovina	1998	06/30/2000		39
P006559	Sao Paulo Integrated Urban Transport Project	Brazil	1998	12/31/2004		45
P043421	Rio de Janeiro Mass Transit Project	Brazil	1998	12/31/2007		186
P003614	Guangzhou City Transport	China	1998	12/31/2007	✓	200
P003619	Second Inland Waterways	China	1998	12/31/2006		123
P036949	National Highway 3-Hubei	China	1998	12/31/2004	✓	250
P045788	Tri-Provincial Highway	China	1998	06/30/2007	✓	230
P001177	Transport Sector Adjustment	Cote d'Ivoire	1998	06/30/2004		180
P057704	Port Sector Reform	Egypt, Arab Republic	1998	06/30/2000		2

Project ID	Project Name	Country	Appro-val FY	Closing Date	Health Focus	Loan/Credit Amount (US$M)
P034154	Ports Rehabilitation	Eritrea	1998	06/30/2007		30
P000755	Road Sector Development Program Support	Ethiopia	1998	05/31/2005	✓	309
P035737	Rural & Main Roads	Guatemala	1998	06/30/2007		67
P003993	Sumatra Region Roads	Indonesia	1998	12/31/2005		234
P010509	Multimodal Transit	Nepal	1998	09/30/2003		24
P053705	Transport II	Nicaragua	1998	06/24/2005	✓	47
P035608	Transport Infrastructure Rehabilitation	Niger	1998	05/30/2003	✓	28
P008593	Roads 2	Poland	1998	09/10/2007	✓	300
P002875	Road Transport	Togo	1998	09/30/2002	✓	50
P043700	Transport Sector Investment	Tunisia	1998	12/31/2005		50
P049543	Road Sector & Institutional Support	Uganda	1998	12/31/2007		30
P004843	Inland Waterways	Vietnam	1998	03/31/2006	✓	73
P003236	Road Sector Investment Program Support	Zambia	1998	03/31/2005	✓	70
P009524	Dhaka Urban Transport	Bangladesh	1999	06/30/2005		177
P037294	Third Road Rehabilitation & Maintenance	Bangladesh	1999	12/31/2005	✓	273
P055230	Abapo-Camiri Highway	Bolivia	1999	10/31/2005		88
P048869	Salvador Urban Transport	Brazil	1999	12/31/2007		150
P004030	Road Rehabilitation	Cambodia	1999	09/30/2006		45
P003653	Container Transport	China	1999	06/30/2005		71
P041268	National Highway 4/Hubei-Hunan	China	1999	12/31/2006	✓	350
P041890	Liaoning Urban Transport	China	1999	12/31/2005	✓	150
P050036	Anhui Provincial Highway	China	1999	08/31/2005	✓	200
P051705	Fujian II Highway	China	1999	06/30/2007	✓	200
P039082	Toll Road Concession	Colombia	1999	04/30/2001		137
P039161	Railway Modernization & Restructuring	Croatia	1999	06/30/2005		101
P056514	Restructuring of the Transport Ministry Project	Georgia	1999	06/30/2003		2
P008499	Road Transport Restructuring	Kazakhstan	1999	12/31/2007	✓	100
P042237	Provincial Infrastructure	Lao PDR	1999	06/30/2007		28
P050589	Transport	Macedonia	1999	09/30/2004		32
P001666	Road Maintenance & Rehabilitation	Malawi	1999	06/30/2006	✓	30
P045053	Rural Infrastructure LIL	Nepal	1999	07/31/2003		5
P053706	Second Roads Rehabilitation	Panama	1999	09/30/2003		85
P042722	Second Highway Rehabilitation & Maintenance	Russian Federation	1999	12/31/2004		400
P052293	Infrastructure Asset Management	Samoa	1999	03/31/2004		14
P002366	Second Transport	Senegal	1999	12/31/2007		90
P002970	Roads Development APL	Uganda	1999	06/30/2008		91
P049267	Second Transport	Uruguay	1999	09/30/2003	✓	65
P004833	Urban Transport Improvement	Vietnam	1999	12/31/2005		43
P068853	Emergency Road Repair	Albania	2000	12/31/2003		14
P044829	Transport	Armenia	2000	12/31/2004	✓	40
P059481	Rural Access Roads	Bhutan	2000	06/30/2006		12
P070086	Trade and Transport Facilitation in Southeast Europe	Bulgaria	2000	09/30/2005		7
P058843	Guangxi Highway	China	2000	06/30/2007	✓	200
P058844	Henan Provincial Hwy 3	China	2000	12/31/2006		150

Project ID	Project Name	Country	Appro-val FY	Closing Date	Health Focus	Loan/Credit Amount (US$M)
P069930	Road Corridor Rehabilitation	Djibouti	2000	08/31/2005	✓	15
P035775	Transport	Estonia	2000	12/31/2005		25
P040556	Roads	Georgia	2000	12/31/2005	✓	40
P009972	National Highways III	India	2000	12/31/2007	✓	516
P035776	Klaipeda Port	Lithuania	2000	12/31/2008		35
P052208	Transport Sector Reform & Rehabilitation	Madagascar	2000	07/31/2005		65
P042039	Railway & Ports Restructuring	Mozambique	2000	06/30/2008		100
P045052	Road Maintenance and Development	Nepal	2000	06/30/2007		55
P054238	Gazelle Restoration II	Papua New Guinea	2000	12/31/2007		25
P039019	National Road Improvement APL1	Philippines	2000	03/31/2007		150
P065041	Trade and Transport Facilitation in Southeast Europe	Romania	2000	06/30/2004		17
P055472	Urban Mobility Improvement APL	Senegal	2000	12/31/2007	✓	70
P050508	Urban Transport	Uzbekistan	2000	03/31/2006		29
P059864	Rural Transport 2	Vietnam	2000	06/30/2006		104
P070078	Trade and Transport Facilitation in Southeast Europe	Albania	2001	03/31/2005		8
P040716	Highway	Azerbaijan	2001	10/31/2007	✓	40
P040150	Roads and Municipal Drainage	Belize	2001	09/30/2005		13
P070079	Trade and Transport Facilitation in Southeast Europe	Bosnia and Herzegovina	2001	09/30/2005		11
P035672	National Transport Program Support SIL	Chad	2001	01/31/2008	✓	67
P045915	Urumqi Urban Transport	China	2001	12/31/2007	✓	100
P056199	3rd Inland Waterways	China	2001	12/31/2007		100
P056596	Shijiazhuang Urban Transport	China	2001	12/31/2008	✓	100
P058845	Jiangxi II Hwy	China	2001	12/31/2006	✓	200
P070088	Trade and Transport Facilitation in Southeast Europe	Croatia	2001	03/31/2005		14
P057538	Road Reconstruction and Improvement	Honduras	2001	06/30/2007		67
P010566	Gujarat Highways	India	2001	12/31/2007		381
P070421	Karnataka Highways	India	2001	10/31/2007	✓	360
P071244	Grand Trunk Road Improvement	India	2001	12/31/2007	✓	589
P050719	Urban Transport	Kyrgyz Republic	2001	11/30/2005		22
P064821	Road Maintenance	Lao PDR	2001	12/31/2004		25
P070089	Trade and Transport Facilitation in Southeast Europe	Macedonia	2001	12/31/2005		9
P065779	Federal Highway Maintenance	Mexico	2001	11/30/2006		218
P056200	Transport Development	Mongolia	2001	12/31/2007	✓	34
P068673	Road Rehab. and Maintenance III	Nicaragua	2001	06/30/2007		75
P056213	Trade & Transport	Pakistan	2001	06/30/2006		3
P044601	Second Rural Roads	Peru	2001	11/30/2006		50
P057731	Metro Manila Urban Transport Integration	Philippines	2001	03/31/2009	✓	60
P008615	Seaway/Port Modernization	Poland	2001	06/30/2007		39
P040795	Railway Restructuring	Poland	2001	12/31/2005		101
P046061	Moscow Urban Transport	Russian Federation	2001	08/31/2007	✓	60

Project ID	Project Name	Country	Appro-val FY	Closing Date	Health Focus	Loan/Credit Amount (US$M)
P064082	Transport Sector Investment	Tunisia	2001	06/30/2009		38
P042927	Mekong Transport & Flood Protection	Vietnam	2001	12/31/2010	✓	110
P070391	Rural Access Improvement Program	Yemen, Republic	2001	11/30/2006		45
P003227	Railways Restructuring SIL	Zambia	2001	06/30/2005		27
P066260	Road Maintenance	Albania	2002	06/30/2007	✓	17
P072458	Transport TA	Algeria	2002	12/31/2007		9
P068968	Road Rehabilitation & Maintenance	Bolivia	2002	12/31/2007	✓	77
P071347	Road Management Safety	Bosnia and Herzegovina	2002	06/30/2007	✓	30
P051696	São Paulo Metro Line 4	Brazil	2002	06/30/2009		209
P055954	Goias State Highway Management	Brazil	2002	12/31/2006	✓	65
P060221	Fortaleza Metropolitan Transport	Brazil	2002	03/30/2008		85
P058846	National Railway	China	2002	12/31/2007		160
P070459	Inner Mongolia Highway	China	2002	03/31/2008	✓	100
P050623	Road Sector Development Program	Ghana	2002	12/31/2007	✓	220
P050668	Mumbai Urban Transport	India	2002	06/30/2008	✓	542
P069889	Mizoram Roads	India	2002	12/31/2007	✓	60
P072539	Kerala State Transport	India	2002	12/31/2007	✓	255
P040578	Eastern Indonesia Region Transport	Indonesia	2002	06/30/2006	✓	200
P034038	Urban Transport Development	Lebanon	2002	06/30/2009		65
P001785	Roads and Bridges Management and Maintenance	Mozambique	2002	06/30/2007	✓	162
P004397	Road Maintenance & Rehabilitation	Papua New Guinea	2002	12/31/2009		40
P074090	Trade and Transport Facilitation in Southeast Europe	Serbia	2002	03/31/2007		7
P065436	Road Development Phase 2 APL	Uganda	2002	06/30/2008	✓	65
P078284	Emergency Transport Rehabilitation	Afghanistan	2003	06/30/2007		108
P082472	National Emergency Employment Program for Rural Access	Afghanistan	2003	09/30/2007		39
P071435	Rural Transport Improvement	Bangladesh	2003	06/30/2009		190
P074030	Transport Sector SIM	Burkina Faso	2003	09/30/2008	✓	92
P054786	Railway Concession SIL	Cameroon	2003	12/31/2008	✓	21
P074490	Douala Infrastructure	Cameroon	2003	12/31/2008	✓	56
P058847	Third Xinjiang Highway	China	2003	12/31/2007	✓	150
P070441	Hubei Xiaogan Xiangfan Highway	China	2003	12/31/2007	✓	250
P076714	2nd Anhui Highway	China	2003	06/30/2009	✓	250
P044613	Road Sector Development Program	Ethiopia	2003	06/30/2009	✓	127
P055085	Second Rural and Main Roads	Guatemala	2003	12/31/2007		47
P050649	Roads	India	2003	03/31/2009	✓	348
P067606	Roads	India	2003	12/31/2008	✓	488
P073689	Rural Transport APL 2	Madagascar	2003	06/30/2009		80
P073626	Trade and Transport Facilitation in Southeast Europe	Moldova	2003	09/30/2007		7
P074963	Lagos Urban Transport	Nigeria	2003	06/30/2009	✓	100
P083906	Emergency Customs and Trade Facilitation	Afghanistan	2004	12/31/2007		31

Project ID	Project Name	Country	Appro-val FY	Closing Date	Health Focus	Loan/Credit Amount (US$M)
P088153	National Highway Asset Management	Argentina	2004	12/31/2008	✓	200
P060573	Tocantins Sustainable Regional Development	Brazil	2004	12/31/2009	✓	60
P064876	Road Sector Development SIM	Burundi	2004	12/31/2009	✓	51
P071207	Provincial & Rural Infrastructure	Cambodia	2004	09/30/2007	✓	20
P069852	Wuhan Urban Transport	China	2004	06/30/2009	✓	200
P075602	2nd National Railways (Zhe-Gan Line)	China	2004	01/31/2008		200
P077137	4th Inland Waterways	China	2004	01/31/2010		91
P081749	Hubei Shiman Highway	China	2004	06/30/2009	✓	200
P082466	Integrated Mass Transit Systems	Colombia	2004	03/31/2009	✓	250
P043195	Rijeka Gateway	Croatia	2004	12/31/2010	✓	157
P082914	Airports Development	Egypt, Arab Republic	2004	06/30/2009		335
P086277	Secondary and Local Roads	Georgia	2004	10/31/2009	✓	20
P073776	Allahabad Bypass	India	2004	06/30/2009	✓	240
P074290	Second Eastern Indonesia Region Transport	Indonesia	2004	06/30/2009		200
P081505	Amman Development Corridor	Jordan	2004	06/30/2009		38
P082615	Northern Corridor Transport SIL	Kenya	2004	12/31/2009	✓	207
P083543	Road Maintenance APL2	Lao PDR	2004	03/31/2009	✓	23
P082806	Transport Infrastructure Investment	Madagascar	2004	06/30/2009	✓	150
P079351	Transport Corridors Improvement (PACT)	Mali	2004	12/31/2008	✓	49
P082754	Rural Roads	Morocco	2004	06/30/2010	✓	37
P010556	Highways Rehabilitation	Pakistan	2004	06/30/2009	✓	200
P035740	Lima Transport	Peru	2004	06/30/2009	✓	45
P078170	Road Maintenance & Rehabilitation	Poland	2004	06/30/2007	✓	126
P075523	Infrastructure Asset Management APL2	Samoa	2004	06/30/2010	✓	13
P075207	Transport Rehabilitation	Serbia	2004	06/30/2011	✓	55
P078387	Central Transport Corridor	Tanzania	2004	12/31/2009	✓	122
P075173	Highways Management	Thailand	2004	06/30/2008	✓	84
P059663	Road Network Improvement	Vietnam	2004	12/31/2008		225
P071985	Road Rehabilitation Maintenance	Zambia	2004	06/30/2010	✓	50
P070628	Provincial Road Infrastructure	Argentina	2005	06/30/2012	✓	150
P087004	Road Sector Support	Cape Verde	2005	08/31/2010	✓	15
P076807	Infrastructure for Territorial Development	Chile	2005	06/30/2010	✓	50
P068752	Inner Mongolia Highway & Trade Corridor	China	2005	06/30/2010		100
P082998	Second Road Sector Development Support Program	Ethiopia	2005	06/30/2012		161
P065127	National Rural Infrastructure	Guinea	2005	09/30/2008	✓	30
P077856	Lucknow-Muzaffarpur National Highway	India	2005	06/30/2010	✓	620
P077977	Rural Roads	India	2005	03/31/2010		400
P082618	Beira Railway SIL	Mozambique	2005	06/30/2010		110
P083923	Rural Access Improvement & Decentralization	Nepal	2005	12/31/2010		32
P088824	Road Maintenance & Rehabilitation 2	Poland	2005	12/31/2007	✓	131
P083620	Transport Restructuring	Romania	2005	07/31/2009	✓	225
P077328	Rail Restructuring	Turkey	2005	09/30/2009		185
P074079	Road Development APL 3	Uganda	2005	12/31/2009	✓	108
P057481	Transport Infrastructure Maintenance & Rural	Uruguay	2005	07/31/2011	✓	70

Project ID	Project Name	Country	Appro-val FY	Closing Date	Health Focus	Loan/Credit Amount (US$M)
	Access					
P085080	Road Safety	Vietnam	2005	12/31/2009	✓	32
P079734	East Africa Trade and Transport Facilitation	Africa	2006	09/30/2011		199
P083751	3A-West &Central African Air Transport TA	Africa	2006	12/31/2009	✓	34
P094488	Highway 2	Azerbaijan	2006	02/28/2011	✓	200
P092990	Road Transport Project	Brazil	2006	06/30/2010		501
P082412	Santiago Urban Transport Adjustment	Chile	2006	12/31/2006	✓	30
P086689	Santiago Urban Transport TA	Chile	2006	12/31/2009	✓	5
P070519	Fuzhou Nantai Island Peri-Urban Development	China	2006	06/30/2011	✓	100
P085333	5th Inland Waterways	China	2006	06/30/2011		100
P093906	3rd Jiangxi Highway	China	2006	12/31/2010	✓	200
P099992	Liaoning Medium Cities Infrastructure	China	2006	12/31/2011	✓	218
P098850	Infrastructure Pre-Investment Facility	Georgia	2006	09/30/2009		5
P095523	Transport and Territorial Development	Haiti	2006	06/30/2013	✓	16
P086775	Rural Infrastructure	Honduras	2006	06/30/2010		47
P083499	Railways Reform	Macedonia,	2006	10/31/2009		19
P094007	Rural Roads II	Morocco	2006	06/30/2012		60
P083952	Fourth Roads Rehabilitation & Maintenance	Nicaragua	2006	12/31/2011	✓	60
P078813	Regional Transport Decentralization	Peru	2006	06/30/2010	✓	50
P096214	Road Maintenance & Rehabilitation 3	Poland	2006	09/15/2011	✓	180
P078389	Infrastructure Development	Sierra Leone	2006	09/30/2011	✓	44
P086411	Road Sector Assistance	Sri Lanka	2006	09/30/2011	✓	100
P075407	Third Rural Transport	Vietnam	2006	12/31/2011		106
P085231	Second Rural Access	Yemen, Republic	2006	11/30/2010	✓	40

Source: World Bank

ANNEX 2A. TSB PROJECTS WITH A HEALTH FOCUS (FY97-06), BY REGION

Region	FY97-01					FY02-06					Total: FY97-06				
	No. of pro-jects	No. with health object-tives	No. with health compo-nents	**(%) with health objec-tives**	**(%) with health compo-nents**	No.of pro-jects	No. with health object-tives	No. with health compo-nents	**(%) with health object-tives**	**(%) with health compo-nents**	No. of pro-jects	No. with health objecti ves	No. with health compo-nents	**(%) with health object-tives**	**(%) with Health compo-nents**
AFR	18	4	8	**22**	**44**	23	6	17	**26**	**74**	41	10	25	**24**	**61**
EAP	35	16	18	**46**	**51**	24	6	14	**25**	**58**	59	22	32	**37**	**54**
ECA	32	6	10	**19**	**31**	15	6	9	**40**	**60**	47	12	19	**26**	**40**
LCR	21	2	4	**10**	**19**	19	7	13	**37**	**68**	40	9	17	**23**	**43**
MNA	6	0	1	**0**	**17**	7	0	1	**0**	**14**	13	0	2	**0**	**15**
SAR	14	1	4	**7**	**29**	15	1	7	**7**	**47**	29	2	11	**7**	**38**
Total	126	29	45	**23**	**36**	103	26	61	**25**	**59**	229	55	106	**24**	**46**

ANNEX 2B. TSB PROJECTS WITH A HEALTH FOCUS (FY97-06), BY INCOME

Region	FY97-01					FY02-06					Total: FY97-06				
	No. of pro-jects	No. with health objecti ves	No. with health compo-nents	**(%) with health object ives**	**(%) with Health compo-nents**	Numb er of project s	Nbr with Health objecti ves	Nbr with Health compo-nents	**(%) with health object ives**	**(%) with Health compo-nents**	No. of pro-jects	No. with health objecti ves	No. with health compo-nents	**(%) with health object ives**	**(%) with health compo-nents**
LIC	47	7	15	**15**	**32**	42	8	26	**19**	**62**	89	15	41	**17**	**46**
LMIC	55	15	22	**27**	**40**	48	10	25	**21**	**52**	103	25	47	**24**	**46**
UMIC	24	7	8	**29**	**33**	13	8	10	**62**	**77**	37	15	18	**41**	**49**
Total	126	29	45	**23**	**36**	103	26	61	**25**	**59**	229	55	106	**24**	**46**

Source: World Bank

ANNEX 3. ACHIEVEMENT OF HEALTH OUTCOMES AND OBJECTIVES

Country, project, and FY of approval	Loan/ credit amount (US$ million)	Health com-ponent (US$ million)	Explicit objective to improve health outcomes	Justified in project documents by health benefits?	Intended to collect health outcome data?	Were any specific components on road safety or health implemented? What activities?	Collected data on health outcomes?
Projects with explicit health objectives							
Albania Durres Port (P040818) 1998	17	0.2	Yes. Improve port safety.	No	No	Yes. The navigation aids component, comprising the replacement of buoys at the entrance channels was deleted from the project and undertaken by the Italian navy. Quays 1 and 6 were repaired.	No.
Armenia Transport (P044829) 2000	40	5.0	Yes. To improve the main road network, with commensurate reductions in total transport costs, to improve road safety, and to increase the operational efficiency of Armenia Roads.	Yes. Road safety conditions are deplorable, with accident rates and fatalities at much higher relative levels than in Europe. The project would preserve the country's considerable investments in transport infrastructure, improve traffic safety, enhance reliability of transport to and from Armenia, and generate employment.	Yes. Road fatalities per 10,000 vehicles	Yes. A National Road Safety Council with a permanent Secretariat was established in 2001 to provide an institutional framework for improving road safety. An accident data system was introduced to identify the nature of accident black spots. Armenia Roads staff and Police received road safety training. Police enforcement was enhanced with the use of speed radar, equipment, and educational campaigns.	Yes. Road fatalities declined from 12.1 per 10,000 vehicles at appraisal (1999) to 10.5 at completion (2004). The target was 11.0 per 10,000 vehicles by 2004.
Bangladesh Third Road Rehabilitation & Maintenance (P037294) 1999	273	11.6	Yes. To improve road safety by developing the institutional capacity in RHD to identify hazardous locations and to design and implement physical measures to reduce road accidents at these locations	No	Yes. Fatalities per 10,000 vehicles.	Yes. 33 out of a target of 41 black spots were eliminated; road markings and traffic signs were upgraded, while a road safety study and various road safety activities and projects including the setting up of a highway patrol and the creation of separate lanes for non-motorized traffic on the N-H-B road were completed. The new highway patrol did not fully follow the	Yes. Fatalities per 10,000 vehicles declined from 76 in 1998 to 60 in 2005, though short of the target of 50 at project completion (2005).

Country, project, and FY of approval	Loan/ credit amount (US$ million)	Health com-ponent (US$ million)	Explicit objective to improve health outcomes	Justified in project documents by health benefits?	Intended to collect health outcome data?	Were any specific components on road safety or health implemented? What activities?	Collected data on health outcomes?
						recommendations of the set-up study.	However, the quality of these statistics may also be in doubt; some safety experts have suggested that road safety in some parts of Bangladesh may have worsened.
Benin Transport Sector Investment Program (P000117) 1997	40	1.2	Yes. Improve road safety conditions.	Yes. Safety and traffic management activities will reduce the cost of traffic accidents, in terms of human life and productivity and damage to vehicles.	No	Yes. Technical assistance was provided to improve the database on road safety as well as to develop and implement a road safety policy. Eleven priority intersections were improved, including traffic management and signalization.	No. There is no evidence presented in the ICR for reduced loss of life.
China Second Xinjiang Highway Project (P003643) 1997	300	3.5	Yes. Increase highway safety.	Yes. Road safety is an important issue in the development of China's road sector, as traffic continues to grow rapidly on all roads and a high-speed, national highway network is developed. The frequency and numbers of people involved in traffic accidents have reached serious proportions in China.	Yes. Number of accidents with fatalities per 10,000 vehicles.	Yes. Black spot identification and improvement, development of methods for measuring the economic losses due to traffic accidents, and development of safety audit procedures. Progress was made in improving traffic safety. A report on Safety Audit Procedures was completed leading to a proposal for black spots improvement which is being considered under the follow-on project. A report on "Methods for Measuring of Economic Losses due to Traffic Accidents" was completed. It is being used for formulating future traffic safety policies and plans.	Yes. Number of accidents with fatalities per 10,000 vehicles was reduced from 25 in 1999 to 21 in 2003. The appraisal target was 19/10,000 in 2005.

Country, project, and FY of approval	Loan/ credit amount (US$ million)	Health com-ponent (US$ million)	Explicit objective to improve health outcomes	Justified in project documents by health benefits?	Intended to collect health outcome data?	Were any specific components on road safety or health implemented? What activities?	Collected data on health outcomes?
China National Highway 2/Hunan-Guangdong (P003654) 1997	400	0.3	Yes. Improve the safety of road transport.	Road safety is an important issue in the development of China's road sector, as traffic continues to grow rapidly on all roads and a high-speed, national highway network is developed. The frequency and numbers of people involved in traffic accidents have reached serious proportions in China.	Yes. Number of accidents with fatalities per 10,000 vehicles.	Hunan Province: All road safety sub-components were implemented satisfactorily. These included identification of blackspots, design and implementation of remedial measures, and development of traffic accident data collection system and analysis. In addition, a number of road safety manuals were prepared and provincial road safety seminars were held. Guangdong Province: Black spot eradication program was implemented.	Yes. Hunan Province: Accidents involving fatalities decreased from 18 per 10,000 registered vehicles in 1999 to 5 in 2003, below the 2005 target of 10. Guangdong Province: Accidents involving fatalities decreased from 20 per 10,000 registered vehicles in 1999 to 12 in 2003; the 2005 target was 10.
China National Highway 3-Hubei (P036949) 1998	250	n.a.	Yes. Improve the safety of road transport.	Yes. Road safety is a serious problem in Hubei Province, as elsewhere in China. In Hubei, while the absolute number of accidents and injuries has declined since 1987, as has the fatality rate per 10,000 vehicles, the proportion of fatalities has been increasing, suggesting more serious accidents with higher frequency of death. The magnitude of losses is likely to accelerate in the future if	Yes. Number of accidents with fatalities per 10,000 vehicles. **Output Indicator**: Number of black spots of the highway safety program completed (out of identified	Yes. A Road Safety Unit was established and is operational. Its main tasks were to carry out road safety audits, road accident analysis and statistics collection, give recommendations on safety measures and activities, and monitor the safety measures taken during and after the construction of civil works. A series of workshops were held on the study of road safety. A road safety pilot plan, safety procedures at	Yes. Accidents with fatalities per 10,000 vehicles were reduced from 40 in 1998 to 12 in 2003, far lower than the appraisal target of 25 for 2005.

Country, project, and FY of approval	Loan/ credit amount (US$ million)	Health com-ponent (US$ million)	Explicit objective to improve health outcomes	Justified in project documents by health benefits?	Intended to collect health outcome data?	Were any specific components on road safety or health implemented? What activities?	Collected data on health outcomes?
				appropriate action is not taken.	black spots).	worksites, identification and remedy of accident black spots and road safety audits were implemented.	
China Anhui Provincial Highway (P050036) 1999	200	3.1	Yes. To improve the safety of road transport.	Yes. Traffic accidents are now a major problem in China and by most measures has the 'world's highest road accident rate. Under the proposed highway safety component, these issues will be addressed both through civil works (improvement of blackspots) and analyses of traffic accidents.	No	Yes. Black spot improvements were carried out as planned. The studies and intergovernmental work with the police led to better information base on traffic crashes and an expanded program road traffic safety in the follow-on project.	Yes. The number of accidents per 100 million vehicles along National Highway G206 was halved (reduced from 124 in 1998 to 56 in 2005.
China Liaoning Urban Transport (P041890) 1999	150	n.a.	Yes. Improve operational efficiency and safety of the road system.	No	Yes. Reduced fatalities, including pedestrian and bicycle deaths.	Yes. Pedestrian barriers, safety islands/medians were constructed. Traffic signs and markings, signals, were provided. A traffic management committee was established in each municipality. However, there were an number of shortcomings. In many locations, the available road width or motorized traffic was increased, while the space allocated to non-motorized vehicles and, specifically, pedestrians was reduced; for example: (i) in Shenyang, several approved designs for street improvements were changed so that pedestrian sidewalks were shared with bicyclists who were forced off the roadways to	Yes. Pedestrians and bicycle accidents declined from 6,498 in 1998 to 2,948 in 2004 and deaths declined from 897 to 698. There was a reduction in accidents in all three cities (Fushun, Anshan, Shenyang), which exceeded the target

Country, project, and FY of approval	Loan/ credit amount (US$ million)	Health com-ponent (US$ million)	Explicit objective to improve health outcomes	Justified in project documents by health benefits?	Intended to collect health outcome data?	Were any specific components on road safety or health implemented? What activities?	Collected data on health outcomes?
						make way for motorized vehicles; (ii) in Anshan, an old concept of junction channelization was employed, which focused on increasing capacity for motor vehicles by adding extra lanes; and (iii) in Fushun, there were no safety islands for pedestrians and junctions were not designed properly either to protect pedestrians or guide flows of bicycles and motor vehicles. Even where safety islands for pedestrians were provided at the marked crossings cars did not give way to bicyclists/ pedestrians crossing between the road edge and the safety islands, creating dangerous conditions, the marked refuge islands did not provide pedestrians with adequate safety. The absence of any guidance from central government such as the recent National Road Safety Law (issued January 1, 2005) also meant that the success of any TM program in China would have been limited.	reduction of 15%, but this was not location-specific, and therefore is not evidence of a reduction that is attributable to the project.

Country, project, and FY of approval	Loan/ credit amount (US$ million)	Health com-ponent (US$ million)	Explicit objective to improve health outcomes	Justified in project documents by health benefits?	Intended to collect health outcome data?	Were any specific components on road safety or health implemented? What activities?	Collected data on health outcomes?
Latvia Highway (P008532) 1997	20	6.0	Yes. Improve road safety conditions in Latvia.	The road safety situation in Latvia is one of the worst in Europe, with 19.9 fatalities per 10,000 vehicles in 1995	Yes. Number of fatalities for 10,000 vehicles. Fatalities on treated accident black spots; accidents with injured on treated accident black spots.	The physical improvements in accident black spots were implemented. The construction of underpasses on major routes, made access to facilities on both sides of the roadway more accessible. In October, 1997, the Road Traffic Law was passed, on the basis of which road traffic regulations, normative documents for vehicle technical control, vehicle registration regulations, drivers' qualification regulations, regulations for road signs, vehicle marking, emergency vehicle coloring and equipment, road marking and other state standards have been developed. On October 25, 1991, the Road Traffic Safety Directorate was established at the Ministry of Transport and Communications. It is responsible for vehicle registration, administering of qualification examinations for drivers and issuing of driving licenses, securing technical inspection of vehicles, surveillance of roads for safe traffic, and developing and maintaining a vehicle and drivers' register and data base. Reporting on traffic safety conditions has improved, including availability of road safety data.	Yes. Fatalities per 10,000 vehicles fell from 19.9 in 1995 to 8.4 in 2000.

Country, project, and FY of approval	Loan/ credit amount (US$ million)	Health com-ponent (US$ million)	Explicit objective to improve health outcomes	Justified in project documents by health benefits?	Intended to collect health outcome data?	Were any specific components on road safety or health implemented? What activities?	Collected data on health outcomes?
Lithuania Highway (P008551) 1997	19	5.0	Yes. Improve road safety conditions in Lithuania.	Yes. The road safety situation in Lithuania is poor by international standards, with 1,094 fatalities in 1991 (2.9 per 10,000 population).	Yes. Fatalities per 10,000 vehicles	Yes. The design and construction of improvements in portions of the national road network that had a high incidence of accidents (accident black spots) were carried out. Coordination and planning for the establishment of an accident reporting system, education for school children in road safety, national road safety information campaigns, training for traffic police, and development of traffic safety design standards for road and street infrastructure, including road signs and road markings, were delayed. Education for school children is included in the school curriculum, but the expanded program envisioned at project preparation was not undertaken. A Road Safety Conference with broad representation and high level participation was held in May 2000. No special training for the traffic police was carried out, but significant improvements were made in the development of road signs and markings for the national road network.	Yes. The number of fatalities per 10,000 vehicles has declined from 7.5 to 6.6 (a 12 percent drop) between 1996 and 1999.
Poland Roads 2 (P008593) 1998	300	12.7	Yes. (a) Improve the road safety situation; and (b) advise on the operation, management, and administration of road safety and its coordination with the	The number of road accidents in Poland is very high; some 57,911 accidents with 6,359 fatalities and 71,419 serious injuries were recorded in 1996. The main causes of traffic accidents: speeding; consumption of alcohol; poor	No	Yes. Road safety initiatives were undertaken: (a) treatment of hazardous locations; (b) black spots elimination (seven out of eleven contracts were completed); (c) installation of cats eyes and rumble strips; (d) adoption of National Road	Yes. The number of road crashes declined from 66,586 in 1997 to 51,069 in 2004. For the same period, the

Country, project, and FY of approval	Loan/ credit amount (US$ million)	Health com-ponent (US$ million)	Explicit objective to improve health outcomes	Justified in project documents by health benefits?	Intended to collect health outcome data?	Were any specific components on road safety or health implemented? What activities?	Collected data on health outcomes?
			National Police.	drivers' training; poor construction of some type of cars that are numerous on Polish roads; black spots and hostile surrounding of the road (trees, poles without protective barriers); low level of traffic law enforcement; a long period of time from the accident until rescue and medical services arrive.		Safety Program in 2001; and (e) coordination between the National Road Safety Council (NRSC), the national traffic police and General Directorate of National Roads and Motorways (GDDKiA). Private companies sponsored signaling of some further black spots. A Regional Road Safety Program was implemented in eight regions (voivodships). The project developed comprehensive training materials covering the whole road safety system which would help to establish a regular training process of road safety personnel of the regional road safety councils, improve their professional skills, and enable them to take more effective leadership in road safety work.	number of fatalities decreased from 7,310 to 5,712. No targets for reduction in fatalities or road crashes were set at appraisal.
Romania Roads 2 (P039250) 1997	150	24.1	Yes. Improve traffic safety and the fitness of the vehicle fleet.	Yes. Road traffic accidents have become a serious problem since the political changes of 1989/90. The annual number of traffic accidents, now exceeding 150,000, is growing rapidly, and growth in motorization is expected to make a trend reversal difficult.	No	Yes. In 2000 the Ministry of Transport established a Global Road Safety Partnership (GRSP) Committee with key stakeholders from Governmental agencies, insurance companies, automobile clubs, road haulers associations, etc. for implementing road safety measures. The year 2002-03 was declared the year of traffic safety and education campaigns were conducted through various media and in the schools. 38 black spots were treated under the project. The police were provided with equipment to control driving under the	Yes. The number of fatalities per 10,000 vehicles decreased from 9.2 in 1997 to 5.8 in 2003. The number of seriously injured people declined from 7,451 in 1997 to 5,538 in 2003.

Country, project, and FY of approval	Loan/ credit amount (US$ million)	Health com-ponent (US$ million)	Explicit objective to improve health outcomes	Justified in project documents by health benefits?	Intended to collect health outcome data?	Were any specific components on road safety or health implemented? What activities?	Collected data on health outcomes?
						influence of alcohol. Vehicles had to undertake technical and pollution control inspections.	
Senegal Urban Transport Reform Technical Assistance (P044383) 1997	7	n.a.	Yes. To assist in the provision of more affordable, reliable and safer public transport services in the Dakar metropolitan area.	No	Yes. Reduction in accidents by public transport in the sub-urban areas in Dakar, Thies et Kaolack .	Yes. The project assisted in development and implementation of a road safety action plan, provided training to about 6,000 bus drivers; and created road safety awareness through media campaigns. Minor adjustments were made to the six most dangerous intersections in Dakar metropolitan area.	Yes. The number of accidents involving public transport declined marginally (by 4% compared to the target of 20% in 2000). (Note: In 1995, a total of 2,318 traffic accidents were reported in Dakar metropolitan area).
Togo Road Transport Project (P002875) 1998	50	1.0	Yes. Improve road safety.	Yes. Improvements in road safety will reduce the cost of traffic accidents in terms of human life and productivity, and damage to vehicles.	Yes. Number of accidents per 10,000 vehicles.	No. The Office of Road Safety was established, and the construction of the Center for Automotive Technical Control (CCTA) headquarters was completed, but both offices have not been operational because of	No. The target was to reduce the accidents per 10,000 vehicles by 10% in 1999 and 3%

Country, project, and FY of approval	Loan/ credit amount (US$ million)	Health com-ponent (US$ million)	Explicit objective to improve health outcomes	Justified in project documents by health benefits?	Intended to collect health outcome data?	Were any specific components on road safety or health implemented? What activities?	Collected data on health outcomes?
						budgetary constraints. TA and training on transport safety and data collection have not been undertaken.	thereafter.
Uruguay Transport II (P049267) 1999	65	5.3	Yes. Strengthen road sector management through the carrying out of a road safety program.	No	No (outcome indicators)? **Output indicator**: 2,500 km of roads to have pavement markings and road signs that meet Mercosur standards.	Yes. Road safety improvements such as placement of road signs and pavements markings were carried out. The study to analyze options to modernize DNV and the road safety pilot did not take place, nor did road safety works at the crossing of (old) Route 1 with the village of Relcon de la Bolsa.	No. No evidence was provided on the strengthening of capacity for road safety
Vietnam Second Highway Rehabilitation (P004842) 1997	196	1.0	Yes. Improve road traffic safety.	Since 1990, traffic accidents and fatalities in Vietnam have doubled and injuries tripled. The factors responsible for the high accident rate include inappropriate design of some road segments, poor vehicle condition, unsafe driver behavior, but most importantly the broad mix of vehicles on roads.	Yes. Reduction in accidents and fatalities.	No. The road safety component was not implemented.	No. The ICR notes that Data collected for sections of National Highway 1 (for the first and second Highway Rehabilitation Projects) showed that accidents did not decrease and the rate per number of vehicles increased. However, no specific numbers are provided. The target was to reduce the

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							number of accidents and fatalities by 20%.
Vietnam Inland Waterways (P004843) 1998	73	n.a.	Yes. Enhance the safety and traffic carrying capacity of the two main inland waterway routes connecting the Mekong Delta with Ho Chi Minh City.	Yes. Waterway safety has declined in recent years due to inadequate navigation aids (navaids), sharp bends and other obstacles. Inadequate navaids make day navigation treacherous and night navigation unsafe for barge convoys.	Yes. Annual number of accidents per 100 vessels.	Yes. Rehabilitation or installation of navaids was carried out. 72 lattice towers, 830 buoys, 266 poles, 661 masts, 498 signboards. The main waterways from Ho Chi Minh City to Kien Luong to Ha Tien and from Cho Lach to Ca Mau to Nam Can (a total of 626 km) and a feeder section from Ganh Hao to Gia Rai (40 km) were dredged and widened to a depth of 3m and a width of 26 to 30m.	Yes. Accidents on project waterways dropped from 0.0034 per hundred vessels in 2000 to 0.0023 in 2005, a 32% decline.
Projects with no explicit health objectives but with health components that were implemented							
Brazil Goias State Highway Management (P055954) 2002	65	n.a.	No	Yes. The rehabilitation and resurfacing, and the paving components of the project will reduce vehicle operating costs, travel time and accidents, thus benefiting road users, and producers and consumers of goods transported by road.	No	Yes. The ICR notes that the planned safety works were carried out. However, it does not provide evidence on the type of work that were undertaken by the project	No
Dominican Republic National Highway (P035722) 1997	75	n.a.	No	No.	Yes. Injuries per vehicle km; Fatalities per vehicle km.	Yes. Road safety works such as road signalization, installation of safety barriers "black spots" improvements were carried out to improve road safety. An accident information system was also developed.	No
Ethiopia Road Sector Development Program Support (P000755) 1998	309	n.a.	No	No	No	Yes, unplanned HIV/AIDS activities were added. The project initiated an HIV/AIDS strategy for the sector. The target groups were the staff of Ethiopia Roads Authority (ERA), contractors, consultants, and the	No

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						local communities at the project sites. The Ethiopia MAP project provided initial funding of US$1.3 million.	
India Andhra Pradesh State Highway (P009995) 1997	350	n.a.	No	No	No	Yes, road safety activities not in the PAD. The Roads and Buildings Department (RBD) conducted safety audits on all 1,400 km of roads and implemented road safety engineering measures such as improved lane marking, crash barriers, and reflective studs, which significantly improved the road safety and driving comfort during night driving. These measures have significantly reduced the head-on collisions during night driving and other types of road accidents.	Yes. The fatalities in the six project roads declined from 52 in 1999 to 39 in 2003 while on one project road increased from 9 to 18.
Malawi Road Rehabilitation and Maintenance (P001666) 1999	30	n.a.	No	No	No	Yes. Road Safety and HIV/AIDS activities (not in the PAD) were implemented. Strengthening the Road Safety Commission, through the baseline survey and road safety database developed under the project has led to identification of black spots and timely interventions to minimize road accidents. The statistics collected helped identify interventions with a high economic rate of return. Road safety initiatives through public information and education enforcement and control and physical improvement to the road environment have been made. The National Road Authority (NRA) collected HIV/AIDS and transport	No. Road accident costs dropped by 47% over a three year period – an intermediate outcome that could be due to fewer accidents. No outcome data on HIV/AIDS collected.

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						related statistics, and held a sensitization workshop for senior management in the sector. The final transport policy incorporated poverty, gender and HIV/AIDS. Workshops were held to create awareness for the new policy guidelines. Clauses for HIV/AIDS activities are now part of tender documents for major development partner funded projects and are to be included in their term maintenance contracts in the near future.	
Nicaragua Transport II (P053705) 1998	47	0.3	No	Yes. There will be significant road safety benefits due to the provision of wider shoulders to allow easier access for motorists in locations with high roadside vending activity and also to separate bicycle traffic.	No	Yes. The project supported a pilot road safety improvement study in key zones with high levels of accidents. Also, training was provided on traffic safety analysis.	No
Niger Transport Infrastructure Rehabilitation (P035608) 1998	28	0.12	No	Yes. Benefits expected from the road transport component are: improved road safety and better protection of road assets.	No	Yes. A Road Safety Action Plan was drawn up and initial actions, such as a data base on road accidents and several road safety campaigns, were implemented. An unplanned (in the PAD) information, education and communication program was implemented to reduce the risk of HIV/AIDS along transport corridors and among transport workers.	No, neither on road safety, nor on HIV/AIDS outcomes.

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Zambia Road Sector Investment Program Support (P003236) 1998	70	n.a.	No	Yes. Road accidents cause both tangible and intangible costs to the economy. Tangible costs include direct costs such as: (i) direct damage to the vehicles (replacement of parts); (ii) policing and administration costs; (iii) medical treatment and indirect costs of injury; (iv) reduction in output due to injury and death; and insurance costs.	Yes. Reducing road accidents by at least 20%.	Yes. Establishment of a Road Transport and Safety Agency (RTSA) and functions were defined as responsible for road safety, traffic management, and motor vehicle licensing. Equipment was procured to enhance road safety. A Road Safety Action Plan was compiled, but its actions were not effected due to a lack of capacity. Support to the National Road Safety Council (NRSC) included procurement of traffic patrol vehicles, road safety education, publicity materials, speed traps, and first aid kits.	Yes. By project closing (2005) road accidents per year increased to 9,588 from 8,200 in 1998 and were much higher than the target of 7,000. Also the number of fatalities per year increased to1,046 from 870 in 1998 and were much higher than the target of 750. The target of reducing road accidents by at least 20% was not met.
Projects with no explicit health objectives with planned health components that were not implemented							
Georgia Roads (P040556) 2000	40	n.a.	No	Yes. In spite of improvements in recent years, traffic safety remains a problem in the road sector. This is due to speed, lack of road markings, inadequate road design and lack of coordination between the responsible organizations. Improvements to traffic safety will be sought by studying the prevailing road safety situation and trends based on available data;	No	No. The consultants developed a comprehensive traffic safety program involving the participation of different agencies, including education and enforcement, and their coordination. The Borrower accepted the recommendations of the consultants, but considers them theoretical for Georgian conditions. The ICR does not suggest that any of the proposed improvements were	No

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				proposing the legal basis and traffic engineering means to monitor, coordinate and improve road and traffic safety; establishing road safety policy; and developing a road safety program for Georgia.		implemented.	
Indonesia East. Indonesia Regional Transport (P040578) 2002	200	4.2	No	Yes. Roadside communities and non-motorized road users are expected to benefit from improved shoulders, planting, drainage, and accident blackspots.	No. **Output indicators:** Number of accident blackspots treated.	No. The accident blackspots component was not implemented. Accident Blackspots improvement, was a purely "physical" component, which one would expect could be implemented fairly easily, proved to be difficult to implement due to the institutional barriers and various lines of responsibilities.	No

Note: n.a. = Not Available
Source: Implementation Completion Reports