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ROADS

Making Roads Safer

LEARNING FROM THE WORLD BANK'S EXPERIENCE

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Abbreviations

AFR	Africa Region (Sub-Saharan)
ADB	Asian Development Bank
ANSV	*Agencia Nacional de Seguridad Vial* (National Road Safety Agency, Argentina)
APL	adaptable program loan
AusAid	Australian Agency for International Development
DNV	*Dirección Nacional de Vialidad* (National Road Agency, Argentina)
DVELA	Driver and Vehicle Examination and Licensing Agency
EAP	East Asia and Pacific Region
EC	European Commission
ECA	Europe and Central Asia Region
EU	European Union
FCT	Federal Capital Territory (Nigeria)
FRSC	Federal Road Safety Corps (Nigeria)
FTSP	Fundamental Traffic Safety Program (Japan)
GEF	Global Environmental Facility
GRSF	Global Road Safety Facility
GRSP	Global Road Safety Partnership
IADB	Inter-American Development Bank
ICR	Implementation Completion and Results Report
IEG	Independent Evaluation Group
iRAP	International Road Assessment Program
ISR	Implementation Supervision Report
LAC	Latin America and the Caribbean Region
LED	light emitting diode
MDGs	Millennium Development Goals
MENA	Middle East and North Africa Region
OECD	Organisation for Economic Co-operation and Development
PDO	project development objective
PPARs	Project Performance Assessment Reports
SAR	South Asia Region
SIDA	Swedish International Development Agency
SSATP	Sub-Saharan Africa Transport Policy Program
TTL	task team leader
UK	United Kingdom
UN	United Nations
UP	Uttar Pradesh
WHO	World Health Organization

All dollar amounts are U.S. dollars unless otherwise indicated.

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Overview

Every year, nearly 1.3 million people worldwide are killed in road crashes, which have become the leading cause of death among people between the ages of fifteen and twenty-nine. More than 90 percent of the world's road fatalities occur in developing countries, and half of the accident victims are pedestrians, cyclists, and motorcyclists. Road accidents disproportionately affect the poor, making road safety an economic development issue. Many crash victims are of working age, and their death or serious injury too frequently leaves their dependents destitute. Governments in poorer countries have assumed they cannot act to reduce death rates until they are wealthier. However, many of today's road safety measures can be implemented relatively inexpensively to reduce death rates, if managed correctly.

The United Nations (UN) invited the World Health Organization (WHO) to coordinate a drive to improve road safety globally. It also proclaimed a Decade of Action for Road Safety (2011–2020) to stabilize and then reduce the level of traffic fatalities and serious injuries around the world. More than 100 countries as well as multilateral development banks—including the World Bank—support the interventions.

For many years, the Bank's involvement in road safety focused primarily on engineering aspects on a project-by-project basis. However, in 2004 the Bank and WHO produced a seminal publication advocating the "safe systems" approach successfully being used by the 34 member countries of the Organisation for Economic Co-operation and Development. Under a safe system, the whole transport system—including road engineering, user behavior, vehicle safety, policing, and accident response—is optimally designed to protect people from death and serious injury.

In 2008, the Bank made road safety a pillar of its transport sector strategy and adopted the safe systems approach in one or two projects in each Region. More recently, the Bank fully adopted the tactic for all roads projects where feasible and encouraged road safety authorities to adopt this practice nationwide.

The Independent Evaluation Group (IEG) is aware of the rapidly worsening road safety situation in the developing world and efforts by the Bank's transport sector to encourage the use of best practices in road projects. This study, a pioneering learning product created by IEG in cooperation with transport operational staff and the Bank's Global Road Safety Facility (GRSF), aims to provide useful knowledge to Bank operational staff involved with road safety, to support Bank and client

countries in fine tuning their road safety strategies and practices, and to support the acceleration of the Bank's operational road safety agenda.

The study's central contributions to these goals are summarized below.

Findings and Lessons

- **To date, the Bank's support improved road safety to varying degrees** in several middle-income countries such as Argentina, China, Colombia, Nigeria, and Vietnam. Sierra Leone is an example of a still-fragile, low-income country moving in the right direction. Progress was more modest in some other countries. A brief client survey showed that most implementing agencies, with two exceptions, observed a notable improvement in Bank support for road safety matters between 2008 and 2013.
- **The Global Road Safety Facility greatly supported the Bank's progress in road safety.** GRSF has an oversight and training role in the Bank's road safety portfolio; it also provides grants for road safety activities, allocating $17 million in grants to date. Since 2006, GRSF promoted the safe systems approach globally with support from the World Bank and from other multilateral development banks and donors. An independent evaluation of the facility in 2009 concluded that it was making a difference with limited available resources. However, the evaluation also determined the facility is under-resourced. IEG concurs that GRSF is a highly flexible model and makes good use of its limited resources.
- **There is room to improve the design and implementation of road projects.** The study found that some projects have a safety objective, but lack specific activities to support it. In other cases, complex project designs were beyond the capacity of institutions to implement. At times, when financing highway improvement or construction, the project design did not include activities for improving the behavior of road users and raising their awareness. As a result, the accident rate increased when the highway opened to traffic. Some road safety projects share the typical implementation difficulties found in most other projects, such as problems with bidding, governance, cost estimation, consultant nonperformance, and financial constraints. The most common implementation issue is that the lead agency is more concerned with completing road works and neglects implementing safety subcomponents until it is too late to complete them before project closure. The study found several allocations of funds from road safety activities to civil works. In addition, designing a good results framework and consistently collecting

information for road safety indicators have always been challenging. The main reason is often a lack of good accident statistics in many countries.

- **The funding gap for road safety remains.** The Commission for Global Safety drew attention to donors' comparative neglect of road safety and recommended that 10 percent of all road infrastructure funding be committed to safety in the future. This has not yet happened. IEG's analysis of World Bank funding for road safety finds a commitment figure of about 3.5 percent. This figure is growing because of the Bank's decision to mainstream road safety in its projects whenever practical. However, not all governments are receptive to spending additional funds on this objective. At times, positive rhetoric is not supported by an action agenda.
- **Knowledge about road safety in the developing world needs to be enhanced.** The study identified a comparative lack of research on the cost effectiveness of road safety measures in the developing world. Similarly, the impact of typical road safety measures in high-income countries is known, but scant information is available about the effects of these same measures in the developing country context. For example, how well do enforcement measures work in countries where petty police corruption is an issue? What is the impact on road safety of the widespread use of minibus, taxis, motorcycles, and other types of transport more commonly used in developing countries?
- **Strong government commitment to improving road safety is a key to success.** A strong coordinating entity for road safety is equally important, one that is empowered to make decisions, has sufficient budget and staff capacity, and has a mandate to coordinate road safety matters across numerous departments and agencies. This is true for both high-income and developing countries. Japan is an example where the prime minister leads the national initiative to improve road safety. Sweden, the global leader in best practice, also has high-level government support. Experience from the Bank's flagship road safety project in Argentina, for example, shows that identifying an individual on the borrower's side who is passionate about road safety and having a government that is strongly supportive make a substantial difference to the likelihood of success and sustainability. Several countries show commitment to varying degrees, including China, Colombia, Georgia, Kenya, Poland, Uruguay, and some states in India. But other countries lack the necessary level of engagement—these include Mali, Peru, Rwanda, and many others.
- **Developing countries could learn from high-income countries.** The study found that although structures may differ, the general characteristics of road safety organizations in high-income countries include a strong central lead

agency that coordinates with a broad range of stakeholders. Other key factors include secure and sustainable funding, a rigorous results framework to measure progress, and a vision for reducing death and injury rates that is shared and strongly supported at a political level. Although high-income countries have considerable resources to apply to improving road safety, developing countries can adopt many of the best practices. They can make progress and can improve accident statistics through low-cost measures, even when constrained by a lack of capacity. The Bank's experience suggests that for each country, a road safety assessment and investment plan can be tailored to the affordability and capacity of the country. The safe systems approach, customized to fit each individual case, is being applied in both middle-income countries such as China, India, and Vietnam, and in poorer countries such as Kenya and Tanzania.

- **Sustainable road safety improvements take time.** The study observed that it took two decades for highly resourced, developed countries to significantly reduce accident rates. Conceivably, less well-off countries with weaker institutional capacity might take longer to achieve these gains, so the Bank's engagement needs to be focused and persistent. Enhancing the Bank's own knowledge and capacity on road safety is also important. A recent requirement calling for all Bank transport practice staff to take a road safety training course would enhance their knowledge and would make a significant impact. But there is a learning curve for staff before they can consistently apply this knowledge and fully adapt to the more holistic safe systems approach. In IEG's assessment, the Bank is headed in the right direction overall, and momentum is increasing. But the Bank needs to be realistic about what can be achieved with its existing resources and about how long the change process takes.

Proposed Way Forward

The year 2015 will be important for the Bank's reputation as a premier lender in the road safety field because this is the midpoint year for the UN Decade of Action. Progress is being made, but it is unlikely that the ambitious goals set for the decade can be met unless the initiative moves forward swiftly and substantial additional funding is deployed. The study proposes a way forward:

- **Make a bolder commitment to road safety including more financial support.** Several global initiatives seek funding—climate change, disaster risk reduction, and improved water and sanitation, among others, are falling short of their targets. Mobilizing funds for road safety is also difficult, despite

carnage on the roads. Unlike campaigns to stop the spread of infectious diseases, where private sector funds are readily available because of the profit incentive in the pharmaceutical industry, roads are largely a public sector good. Attempts to secure funds from the insurance and motor manufacturing industries have had limited success so far, but that does not mean this avenue is closed. Bilateral and multilateral development institutions are still the obvious source of funds, and the World Bank is seen as the premier institution with a strong leadership role. Selecting an arbitrary percentage target for road safety funding would be a mechanical solution; however; clearly the Bank needs to make a bolder commitment and give GRSF more support, including financial support. This step would likely involve high-level stakeholder meetings and perhaps engaging professional fundraisers.

- **Update the Bank's transport business strategy.** The GRSF strategic plan is current, but the transport sector business plan is out of date. A new plan will likely reflect the framework of the reorganized Bank in relation to global practices and cross-cutting solution areas. The Bank's next transport business strategy could also benefit from considering three things: the implications of scaling-up road safety activities; the need for collaboration across Global Practices such as Health, Transport, and Urban, Rural and Social Development; and the effectiveness of the safe systems approach.
- **Improve project design and focus more on the implementation of road safety activities.** Safety aspects, where applicable, should be included in project objectives, and road safety components should be self-standing. Appropriate due diligence to mitigate for speed and other factors should be mandatory, and the local community should be consulted on the road safety aspects of the project. Better project supervision can ensure that safety components start early and are not delayed to the point that there is a serious risk they might not be completed. A safety components status review could receive particular attention during the project's mid-term review. Designing a good results framework is another crucial factor, since progress cannot be measured without performance indicators. On the borrower's side, if the country has poor road accident statistics, an immediate priority is to create a crash database and train police to improve accident reporting.
- **Accelerate toward the road safety "tipping point."** A road safety tipping point is reached when governments and the public start to treat road safety as a major priority. Experience suggests that often a tipping point is reached only after a series of terrible crashes arouses the public's anger and pressures politicians to take action, as evidenced in Argentina and Turkey. In developing countries, especially where affected people have less voice, the Bank needs to be persistent in advocating for road safety measures and could

discuss the need for improved road safety with its clients at the highest levels of government. Engaging nongovernmental organizations could also be critical in shaping public opinion and influencing the government.

- **Enhance the Bank's own road safety knowledge.** As the Bank mainstreams road safety, it is expected that the number of interventions in vehicle safety, road user behavior, and post-crash care will increase. The Bank should record the experiences of the application of these various road safety measures to improve its best practice. This may involve encouraging borrowers to continue recording data even after the project is closed. It could also encourage partners, clients, and other stakeholders to contribute information from non-Bank-financed projects. The Road Safety Observatory being implemented in Latin American countries deserves strong support and could be replicated in other Regions.
- **Set minimum safety requirements.** Bank financing should never be used to build an unsafe road, even if enhancing safety increases the project's cost. In particular, safety aspects should be part of the acceptance process at the detailed design and pre-opening stages. This aim should be emphasized in the Guidelines for Road Safety Management Capacity Reviews and Safe System Projects (Bliss and Breen 2013). The design should account for appropriate due diligence to mitigate for speed and other factors, and the local community should be consulted on the road safety aspects of the project. Although making road safety a safeguard could be considered, such a move may not be feasible at this time. However, a strong argument can be made for introducing mandatory road safety audits linked to road investment loans or credits. A simplified version may be needed for low-capacity countries, but an audit requirement would still be essential. Efforts could also be made to ensure that discussions with the public about a proposed road project include road safety implications and potential remedial measures. Funding for these activities could either be part of the loan or grant or take the form of a project preparation facility.
- **Copy innovative and effective ideas where appropriate.** When innovative ideas are proved to be effective to improve road safety, the Bank should encourage replicating those ideas where appropriate. For example, an important subcomponent of the Argentina Road Safety Project included a $10 million incentive program that helped participating provinces and municipalities finance innovative road safety initiatives that otherwise would not have been funded because of competition for limited financial resources. A similar Challenge Fund was instituted in India in the Kerala State Transport Project 2.

- Road safety interventions should be appropriate for the country's circumstances. Every country is different, and although the principles behind success in road safety are tried and tested, their application must be customized to fit each individual case.

1. Introduction

Every year, nearly 1.3 million people are killed in road accidents worldwide (WHO 2013a), and road crashes are the leading cause of death among people between the ages of fifteen and twenty-nine. More than 90 percent of the world's road fatalities occur in developing countries, and half of these deaths are pedestrians, cyclists, and motorcyclists—the most vulnerable road users. Only 28 countries, or just 7 percent of the world's population, have adequate laws to address the main risk factors, which are excessive speed, drunk driving, and failure to use crash helmets, seat belts, and child restraints. If no action is taken to reduce this carnage, the annual number of deaths from road traffic injuries could top 1.9 million by 2030 and become the fifth highest cause of death globally (WHO 2009).

Road accidents disproportionately affect the poor, making road safety an economic development issue. Many crash victims are of working age and their death or disability too frequently leaves their dependents destitute. Most victims of road crashes are not inside a motor vehicle, as World Bank statistics from the South Asia Region demonstrate.

For example, in Dhaka, Bangladesh pedestrians comprise almost 75 percent of road accident fatalities, and in New Delhi, India, and Colombo, Sri Lanka, pedestrians, pedal cyclists, and motorcyclists account for more than 80 percent of the total road traffic deaths. Road accidents result in economic burdens that pose major challenges to health care systems. The economic cost of road crashes and injuries is conservatively estimated to be between 1 and 3 percent of the gross national product for low- and middle-income countries, or about $65 billion—which, ironically, is more than these countries received in development assistance (Peden et al. 2004).

Disability reinforces poverty. Exclusion and marginalization of disabled people reduce their opportunities to contribute productively to the household and the community and thus increase the risk of poverty. Studies of the impact of vehicle accidents on poor communities in Bangladesh and India show that most poor households went into debt by borrowing money to cope with the additional costs and lack of income following a road crash. Some also reduced their financial security by selling an asset, and few chose or were able to take on extra work. Consequences included reduced household income and reduced food consumption for the victim's family (Aeron-Thomas 2004). "Poverty isn't just a lack of money; it's a lack of knowledge and a lack of understanding. Middle-class car drivers believe in cause and effect, so they buy safe cars and wear seatbelts. Many poor people see life as something that just happens to them, and that they cannot control. Therefore, to

poor people, road accidents are simply bad luck, rather than bad management. Worse, in many country areas, there is no public transport, so the poor often drive illegal cars that won't protect the occupants in a collision" (Matthew-Wilson 2014).

Consequently, investment in road safety usually leads to substantial net economic gains, according to the Swedish International Development Agency (SIDA 2006). In high-income countries, road safety actions in general yield economic returns ranging from 9 to 22 percent. Unfortunately, reliable data are not available for low-income and middle-income countries, but based on reductions in the high level of crashes, some individual World Bank projects estimate high rates of return. The Vietnam Road Safety Project showed returns at closure of between 59 and 74 percent, whereas the active Argentina Road Safety Project, using disability-adjusted life years, estimates that the economic rate of return will be in the order of 122 percent.

During the past two decades, significant progress was made in in public health programs to fight infectious diseases in developing countries. Polio is confined to a handful of countries, HIV/AIDS is gradually being brought under control, and the incidence of malaria and tuberculosis is being reduced. However, the human-made epidemic of road crashes has not been treated with the same urgency. Although $4 billion per year was spent on controlling infectious diseases, road safety has not attracted equal financial support. Even so, building roads is an effective way to stimulate economic growth that is financed by development banks and donors. There is no shortage of road projects yielding robust rates of return on investment, but not all of these roads are safe. *The Economist* cites the Northern Corridor in Kenya, one of East Africa's main trade routes, which was upgraded in 2008 with European Union funding. Most of the $91 million was spent on asphalt, but little was spent to address safety issues. Traffic travels at speeds of up to 80 mph, but little provision is made for passing lanes, and pedestrians are not protected (*The Economist* 2014).

Affluent countries made a concerted effort in the 1970s to make roads safer. Governments in poorer countries assumed they had no option but to follow a similar path and accept alarming rates of road deaths until they were wealthy enough to reverse them. However, current thinking suggests that many road safety measures can be implemented somewhat inexpensively, such as well-sited central barriers to prevent head-on collisions, speed bumps to slow traffic passing through villages, and improving public awareness of the importance of wearing seatbelts and motorcycle helmets. The "low hanging fruit," where the most impact can be achieved on reducing accident rates, varies from country to country. The biggest single constraint to reducing traffic crashes remains a lack of capacity in the entities responsible for road safety.

United Nations Decade of Action for Road Safety

Aware of the worsening road safety situation in developing countries and taking note of the preliminary findings of the Commission for Global Road Safety (2008), which was founded by the FIA Foundation, the United Nations (UN) General Assembly adopted a resolution in 2008 on the urgent need to improve road safety globally (UN 2008). It already recognized the limited capacity of many countries to address the road safety problem. Accordingly, it invited WHO to coordinate road safety within the UN (in collaboration with the UN regional commissions) and to organize Road Safety Weeks as platforms for awareness. The Commission for Global Road Safety finalized its report in 2009. At the first Global Ministerial Conference on Road Safety, held in Moscow in 2010, the report was discussed as a basis for the UN General Assembly's landmark proclamation of a Decade of Action for Road Safety (2011–2020). The initiative was formally launched on May 11, 2011. It aims to stabilize and then reduce the level of road traffic fatalities and serious injuries around the world. More than 100 countries as well as multilateral development banks supported the intervention. The ambitious goal advocated by the Commission for Global Safety and adopted by the UN was to reduce the predicted level of traffic fatalities by 5 million and the expected number of serious injuries in developing countries by 50 million by the year 2020 (UN 2011). Targets by Region are shown in table 1.1.[1] The Commission also drew attention to the neglect of road safety by donors and recommended that 10 percent of all road infrastructure funding should be committed to safety in the future.

Table 1.1. United Nations Decade of Action Targets

Region	Actual Fatalities (2010)	Estimated (2020)	UN Fatality Target for 2020	Lives to be Saved (2011–2020)	Serious Injuries Avoided (2011–2020)
AFR	248,130	365,000	182,500	937,000	9,370,000
EAP	313,317	646,000	323,000	1,640,000	16,400,000
ECA	85,979	97,000	48,500	243,000	2,430,000
LAC	95,877	130,000	65,000	325,000	3,250,000
MNA	100,655	152,000	76,000	380,000	3,800,000
SAR	275,569	590,000	295,000	1,475,000	14,750,000
Total	**1,119,527**	**1,980,000**	**990,000**	**5,000,000**	**50,000,000**

Source: See statement made on April 19, 2011— "MDB Road Safety Initiative: A Development Priority." http://siteresources.worldbank.org/INTTOPGLOROASAF/Resources/WB_GRSF_MDB_web.pdf.
Note: Excludes high-income countries. AFR = Africa; EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia.

The Commission is now pushing to include road safety in the framework that replaces the Millennium Development Goals (MDGs).[2] Since 2000, the MDGs

provided a focus for global development efforts. However, the MDGs did not include either transport or road safety, although road crashes result in higher levels of fatalities than communicable diseases such as tuberculosis and malaria. Including road safety in the MDGs' successor—the Sustainable Development Goals that will launch in 2015—is seen as critical for mobilizing sufficient political and financial support for the UN Decade of Action for Road Safety to achieve its goals. Road safety currently falls under the proposed theme "Sustainable Cities and Thematic Settlements," but this matter is still under debate; 2015 will mark the midpoint of the Decade of Action for Road Safety.

The 2013 Global Status Report details early trends since the Decade of Action for Road Safety began (WHO 2013b). It shows no overall reduction in the number of people killed on the world's roads (nearly 1.3 million annually). However, this plateau should be considered in the context of a corresponding 15 percent global increase in the number of registered vehicles, suggesting that interventions to improve global road safety mitigated the expected rise in the number of deaths. Eighty-eight countries—in which almost 1.6 billion people live—reduced the number of deaths on their roads between 2007 and 2010, showing that improvements are possible and more lives will be saved if countries take further action. However, of concern is that 87 countries saw an increase in road traffic deaths during the same period. The report also shows that the highest road traffic fatality rates are in middle-income countries, particularly in the Africa Region. More than three-quarters of all road traffic deaths occur among young males.

Purpose of Study

The Bank has been active in supporting road safety in its client countries and recognized that it should invest more resources in this area. During the 1980s and 1990s, Bank-financed road projects generally accounted for safety and followed the accepted wisdom of the time by emphasizing road engineering aspects. In recent years, the Bank moved to adopt the safe systems approach to road safety developed by the 34 countries in the Organisation for Economic Co-operation and Development (OECD) and increasingly being adopted globally. The aim of safe systems is to establish a more forgiving road system that accounts for human fallibility and vulnerability. Under a safe system, the whole transport system—including road engineering, user behavior, vehicle safety, policing, and post-crash care—is optimally designed to protect people from death and serious injury.

In 2002–2013, the Bank approved 843 road projects, of which 166 could be considered road safety projects because they have road safety objectives or road

safety activities. The Bank's commitment for road safety activities is estimated at $790 million. Because 2015 will mark the midpoint of the Decade of Action for Road Safety, it is important for the Bank to take stock of what has been done and how effective its support to road safety has been. The information and lessons generated could be used to improve and fine-tune the strategic approach and road safety practices in both the Bank and its client countries.

The Independent Evaluation Group (IEG) was aware of the troubling road safety situation in the developing world and the Bank transport sector's efforts to encourage the use of best international safety practice in road projects. After discussions with several senior transport sector staff, IEG decided to conduct a study on road safety because it believed a learning product on issues and experiences in implementing projects with road safety content could be highly beneficial to accelerating the operational road safety agenda. The IEG study is a pioneering learning product conducted in cooperation with transport operational staff and the Bank's Global Road Safety Facility (GRSF). The study's objective is to thoroughly understand which road safety practices the World Bank supported during the last decade, the degree of success that was achieved, and which projects are useful examples of successful implementation going forward. The IEG study proposal to initiate this work was presented to staff at the State of the Transport Sector Meeting on October 24, 2013 and further discussed at a Transport Sector Board meeting on March 19, 2014.

Methodology

The evaluative procedures focus on drawing lessons and experiences relevant for future operations in the sector. The key elements used for this study include a portfolio review, interviews with task team leaders (TTLs), a literature review, and a brief client survey.

Regarding the portfolio, GRSF conducted its own review of road safety activities (since its inception in 2006) and made its findings and database available to the IEG evaluation team. The IEG study expands the scope of this work to cover all World Bank projects, both active and closed, between FY02 and FY13. A total of 843 road transport projects were screened and 166 were identified as road safety projects. Projects were further analyzed to derive the number of projects with road safety content by type (for example, infrastructure safety, vehicle safety, road user behavior, capacity building, and post-crash care). Progress in Argentina's flagship road safety project and other selected pilots was given special attention and presented in the case studies. To the extent possible, the study tries to not duplicate

the GRSF analysis and findings; instead, it builds on this rich knowledge platform through more in-depth evaluation of implementation experiences in active projects with case studies supplemented by a review of actual results from closed projects and active projects. Reviewing the Bank's non-lending road safety activities and experiences where relevant from developed countries was also part of the study. The study also draws on the latest international thinking on road safety where it is pertinent to developing countries.

The team interviewed transport staff who were involved in major projects with road safety objectives or components, and in some cases asked TTLs to provide additional information, especially about mature active projects with significant road safety components. A total of 25 TTLs and specialists were interviewed. Implementation Completion and Results Reports, IEG reviews, and lessons learned were used for closed projects. For active projects, project appraisal documents, implementation support reports, and aide memoires were reviewed.

IEG also conducted a brief client survey to better understand the implementing agencies' perspectives on the effectiveness of the Bank's support to road safety. The road safety content of previous evaluations of the World Bank and other multilateral organizations was also reviewed. These included the IEG transport evaluation (IEG 2007a) and the institutional capability and financial viability evaluation (IEG 2013a). In particular, work in connection with the steep rise in motorcycle ownership was studied, especially in Asia such as the effects of the introduction of the compulsory crash helmets in Vietnam.

The study has four parts. After introducing the deteriorating road safety situation worldwide in chapter 1, chapter 2 gives the context in which the Bank decided to ramp up its focus on road safety and how its strategies evolved over time. It then assesses the portfolio review findings in chapter 3. Chapter 4 examines the effects of closed road projects, many of which were implemented based solely on engineering aspects, and then turns to active projects, where an increasing number followed the safe systems approach. The findings are consolidated in chapter 5 on the learning over the years and from international best practice, leading to a summary of aspects on which the Bank needs to focus in the short to medium term. The typology of interventions discussed in this study that the Bank now follows is:

- To incorporate best practice road safety engineering design to specific road segments it finances.
- To apply a safe systems approach to specific road segments financed.
- To apply a safe systems approach to road safety on a corridor, Region, or national basis, not restricted to specific Bank-financed investments.

Appendix A presents information for high-income countries. A full list of projects examined with road safety content is provided in appendixes B, C, and D, and appendix E summarizes the main case studies.

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[1] The table is drawn from a statement made on April 19, 2011— "MDB Road Safety Initiative: A Development Priority"—by seven Millennium Development Banks (MDBs): African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank, Islamic Development Bank, and World Bank. http://siteresources.worldbank.org/INTTOPGLOROASAF/Resources/WB_GRSF_MDB_web.pdf

[2] The eight Millennium Development Goals, which range from halving extreme poverty rates to halting the spread of HIV/AIDS by 2015, form a blueprint agreed to by 189 countries and the world's leading development institutions.

2. The World Bank and Road Safety

The World Bank Support for Road Safety Evolves

The World Bank stayed informed on developments in road infrastructure safety during the 1980s and 1990s. The road projects financed generally accounted for safety and followed the accepted wisdom of the time by emphasizing road engineering. This involved incorporating road safety measures into highway design for new construction projects, eliminating accident black spots (sometimes called hazardous locations) in rehabilitation projects, and applying appropriate safety measures for workers and road users in the construction zone itself.

An informal best practice approach included information sharing, but the Bank's transport policy documents put a limited emphasis on road safety. The 1996 policy document *Development in Practice: Sustainable Transport* covered road safety under its section on environmental sustainability (World Bank 1996). It highlighted the high injury rates of pedestrians and cyclists in developing countries and advocated safety audits for new construction and traffic management schemes. The Bank contended there should be separate rights-of-way for pedestrians and non-motorized vehicles where possible, as well as improvements where different types of traffic intersect. It also stressed the need for improved regulations and their enforcement, and better road user education.

The document further noted that rehabilitated roads often retained poor horizontal and vertical alignments; new surfaces, wider seals, and straighter alignments tended to encourage higher speed, which needed mitigation measures to avoid increased accident severity. In this regard, there was some evidence of occasional inconsistencies in approach between different projects in different countries. This was due to borrowers—and perhaps task team leaders (TTLs)—prioritizing the length of road completed over potential safety concerns, and neglecting to mitigate for higher traffic speeds after the road improvements. The 2002 Urban Transport Strategy Review, Cities on the Move, also discussed the importance of enhanced road safety education and other road safety measures such as better road accident data collection, improved road design and traffic management, safety audits and improved medical response (World Bank 2002). Road safety, however, was rarely center stage, and few projects had objectives or components directed specifically at road safety.

The picture began to change in the late 1990s when the World Bank perceived that road safety needed a more focused approach based on the use of safe systems.

Under a safe system, the whole transport system, including road engineering, user behavior, vehicle safety, policing, and accident response, is designed as much as possible to protect people from death and serious injury. The Bank was active in helping establish the Global Road Safety Partnership (GRSP) in 1999. GRSP was set up as a nonprofit organization to bring together government, the private sector, and civil society. Its role is to create and support multi-sector road safety partnerships engaged in frontline good practice road safety interventions in countries and communities throughout the world. Its main work has been more in supporting road-user-related interventions, instead of the road infrastructure environment traditionally covered in World Bank highway projects.

In 2004, the World Bank and the World Health Organization (WHO) jointly produced a report on road traffic injury prevention, followed by specific country reports on road safety (Peden et al. 2004). This was a turning point for both organizations when it was realized that the best way to reduce road traffic injuries was by adopting a holistic approach using safe systems in each country, customized to the particular circumstances prevailing in each case. Some early attempts to address road safety more comprehensively were also made at this time in countries such as Turkey and Vietnam.

In 2008, the Bank adopted a new business strategy: "Safe, Clean, and Affordable Transport for Development" (World Bank Group 2008). The word "safe" was introduced to formally reflect the broadening transport agenda, and road safety became an integral part of the new business plan. In the overview to the business strategy, "safe transport" acknowledged the prominence of people's health in the Millennium Development Goals, including the safety of transport users, transport workers, and the larger community. The transport business strategy introduced the safe systems approach as the main approach to address road safety issues in developing countries. The Bank follows the safe systems approach because it is thoroughly tested, and there is an opportunity to benefit from experience earned at great cost in high-income countries over an extended period. However, the Bank supports a phased approach that requires an initial capacity review to assess the lead agency role and specify a long-term investment strategy. The detailed preparation and implementation of safe systems projects are scheduled according to the available budget, focusing on areas that can achieve the most immediate results. Ideally, the safe systems approach includes these recommendations:

- Address all elements of the road traffic system in an integrated way.
- Emphasize reducing death and long-term injury instead of crash prevention.
- Accept that road users are fallible and crashes will occur.

- Manage energy transfer to ensure that road users are not exposed to crash forces likely to result in death or serious injury.
- Emphasize the shared responsibility of road network designers and users for achieving road safety results.
- Demand equity in addressing the safety needs of both motorized and non-motorized users.
- Align with other sustainable development goals and seek co-benefits such as improved air quality, greenhouse gas reduction, energy security, poverty reduction, social inclusiveness, and occupational health and safety.
- Strengthen all elements of the road safety management system, especially institutional management functions (World Bank 2012).

Internally, the Bank enhanced cross-sector collaboration to support implementing the safe systems approach. Because of the linkage between road safety and health, particular attention was paid to health aspects in recent years, including response time of medical assistance reaching crash victims. These sectors were in completely different networks in the Bank's institutional structure and will be in separate global practices under the Bank's current restructuring. In April 2013, a meeting was held between the Health, Nutrition, and Population and Transport Sector Boards. The meeting intended to raise the profile of the road safety agenda and agree on common areas to strengthen collaboration between transport and health. Information sharing grew from virtually zero to the inclusion of health specialists on transport teams where appropriate. Collaboration improved following a series of such meetings, according to the TTLs. But in practice, primary authority usually went to the sector to which the project was mapped, as found in the learning study on World Bank experience with avian influenza (IEG 2014). When coordination worked, it was largely because of positive personal relationships between particular individuals instead of any systematic institutional support in the Bank. This appears to be less of a problem with urban transport projects, which have a history of cooperation between the urban and transport sectors.

In June 2013, the safety initiative was expanded and road safety screening (an analysis of the potential for road safety elements) was introduced for all road projects. Not all such projects had potential for road safety improvements, but each was evaluated to determine what was possible. Clearly many factors had to be considered, including the degree of commitment toward road safety by the borrower and each country's institutional capacity. It was important, however, to ensure there was a consistent approach and that no opportunity was lost to move forward with the road safety agenda. A recent working paper produced by the Sub-Saharan Africa Transport Policy Program (SSATP) goes one step further and

discusses how to mainstream road safety in a corridor or regional project (SSATP 2013).

Partnership Arrangements

THE GLOBAL ROAD SAFETY FACILITY

The Global Road Safety Facility (GRSF) housed in the World Bank began formal operations in April 2006. The facility was a direct response by the Bank to the global call for action by the UN General Assembly. GRSF aims to generate increased funding and technical assistance for global, regional, and country-level activities designed to accelerate and scale up the efforts of low- and middle-income countries to build their scientific, technological, and managerial capacities to prepare and implement cost-effective road safety programs. The GRSF promotes a global safe systems approach with support from both the World Bank and from other multilateral development banks and donors. Since its inception, the GRSF has helped the Bank in its effort to move from a piecemeal approach to road safety to a more comprehensive, integrated, systematic safe systems approach in its operations. Staff training and certification in handling road safety matters is also under way, and assistance in the road safety sector is often extended beyond immediate projects by various means.

The Facility Implementation Unit is responsible for oversight of the portfolio of road safety activities, including preparing the annual Facility Business Plan, screening and evaluating grant proposals to the facility, approving proposals and deciding on fund allocations, preparing regular facility performance reports, and supporting stakeholder consultative meetings. The facility has five full-time staff including a program coordinator. Though associated with the World Bank, GRSF aims to be a provider of independent analysis and advice that helps interested parties to understand the root causes of the road safety crisis and the mechanisms most likely to shape positive outcomes. It works with client governments to develop specific interventions designed to encourage local ownership of, and sustained investments in, road safety programs. GRSF allocated about $17.3 million in grant financing since 2006, which is below expectations. An independent evaluation of GRSF's first two and a half years of operation concluded that GRSF was a highly flexible model and was already making a difference despite its limited resources (Universalia 2009). It was under-resourced, however, and road safety as a whole failed to attract sufficient resources. The Bank could raise the profile of GRSF by increasing its contribution, though, which would signal that it was more serious about road safety and would likely help attract additional funds from other sources.

WORLD HEALTH ORGANIZATION

Collaboration between the World Bank and WHO culminated in the landmark publication in 2004 of the *World Report on Road Traffic Injury Prevention*. This peer-reviewed report was developed with input from a professional team of more than 100 experts. The debate on reducing road casualties was strengthened in 2006 by an independent Commission for Global Road Safety and the discussions culminated with the declaration of the UN Decade of Action for Road Safety. Subsequently, a partnership developed with the WHO, the World Bank, the GRSF, the FIA Foundation (an independent, registered charity), and the GRSP. Under this partnership a number of practical implementation and enforcement good practice guidelines were produced, including speed management, crash helmet use, accident data systems, seat belts and child restraints, and limiting drinking and driving.

MULTILATERAL DEVELOPMENT BANKS

In April 2011, the World Bank and six other development banks committed to a shared global and regional program of road safety activities. Partners in the Multilateral Development Banks' Road Safety Initiative include the Inter-American Development Bank, Asian Development Bank, African Development Bank, European Bank for Reconstruction and Development, Islamic Development Bank, European Investment Bank, and World Bank. Together these institutions are expected to provide about $200 billion in road building investments during the UN Decade of Action for Road Safety. The multilateral initiative calls for an integrated safe systems approach that promotes shared responsibility for ensuring safe mobility and begins with countries naming a lead agency to direct a national road safety strategy. The development banks will help accelerate knowledge transfer, strengthen institutional capacity, and scale up road safety investment.

INTERNATIONAL ROAD ASSESSMENT PROGRAM

The International Road Assessment Program (iRAP) is a registered charity dedicated to preventing the more than 3,500 road deaths that occur every day worldwide. It provides automobile associations, governments, funding agencies, research institutes, and other nongovernmental organizations in more than 70 countries with tools and training to make roads safe. Its activities include inspecting high risk roads, and developing "Star Ratings," "Safer Roads Investment Plans" and risk maps, among other things. GRSF is investing in a program to survey 30,000 kilometers of roads and prepare investment and design decisions by local authorities in partnership with iRAP.

FIA FOUNDATION

The FIA Foundation is an independent, registered charity that supports an international program of activities promoting road safety, the environment, and sustainable mobility, as well as funding motor sport safety research. It led the Commission for Global Road Safety and supported several publications providing road safety guidelines. In February 2014, Commission Chairman Rt. Hon. Lord George Robertson, of the Make Roads Safe Campaign, led a discussion at the Brookings Institution on the need to find additional sources of catalytic funding to support country-led road injury prevention efforts. A number of potential funding sources were identified, and the FIA Foundation advocated for the motor industry to become more engaged in road safety issues.

BLOOMBERG PHILANTHROPIES

Bloomberg Philanthropies supports road safety initiatives because it perceives an urgent need, especially since WHO estimates that road traffic fatalities will be the fifth leading cause of death by 2030. It also believes traffic crashes are preventable with effective and evidence-based interventions. Bloomberg Philanthropies works primarily to advance five areas globally: arts, education, environment, government innovation, and public health. To date, Bloomberg Philanthropies has invested $125 million in global road safety. Its Global Road Safety Program delivers evidence-based infrastructure safety and capacity-building interventions through strategic partnerships (including the World Bank) in 10 selected low- and middle-income countries.

SUB-SAHARAN AFRICA TRANSPORT POLICY PROGRAM

The SSATP supports creating and strengthening road safety agency action plans and high impact interventions in SSATP member countries and trade corridors. The SSATP is an international partnership to facilitate policy development and related capacity building in the transport sector in Africa. The partnership is funded by a multi-donor trust fund that includes 38 Sub-Saharan Africa countries, eight regional communities, two African institutions, the UN Economic Commission for Africa, and the African Union as well as numerous bilateral and multilateral partners. The European Commission is the main donor, and the host organization is the World Bank. SSATP's road safety program facilitates the exchange of good practice information between SSATP member countries and stakeholders in general. Its strategy encourages a process in which information and analysis provide the basis for consistent policies that can be implemented through member countries' national strategies and results-oriented action plans. The results achieved in the field give feedback to the policy level.

The program's findings are disseminated through workshops, publications, and its website (http://www.ssatp.org). In 2013, SSATP and GRSP held the International Road Safety Conference in Addis Ababa, Ethiopia, building on a previous year's conference on urban road safety held in Lusaka, Zambia. SSATP developed policy statements, gathers road safety data pertinent to Africa, and encourages member states to develop strong lead agencies and to support the UN Decade of Action.

The nonprofit GRSP creates and supports multi-sector road safety partnerships engaged with frontline good practice road safety interventions in countries and communities throughout the world. GRSP was formed in 1999, and its members are leading multi-and bi-lateral development agencies, governments, businesses, and civil society organizations. Hosted by the International Federation of Red Cross and Red Crescent Societies, GRSP is governed by a constitution approved by a steering committee. It plays a powerful role in capacity building and training road safety practitioners, actively engages in advocacy at all levels, provides road safety program coordination at the global level, and is a recognized expert source of road safety knowledge and good practice.

3. The Bank's Road Safety Portfolio

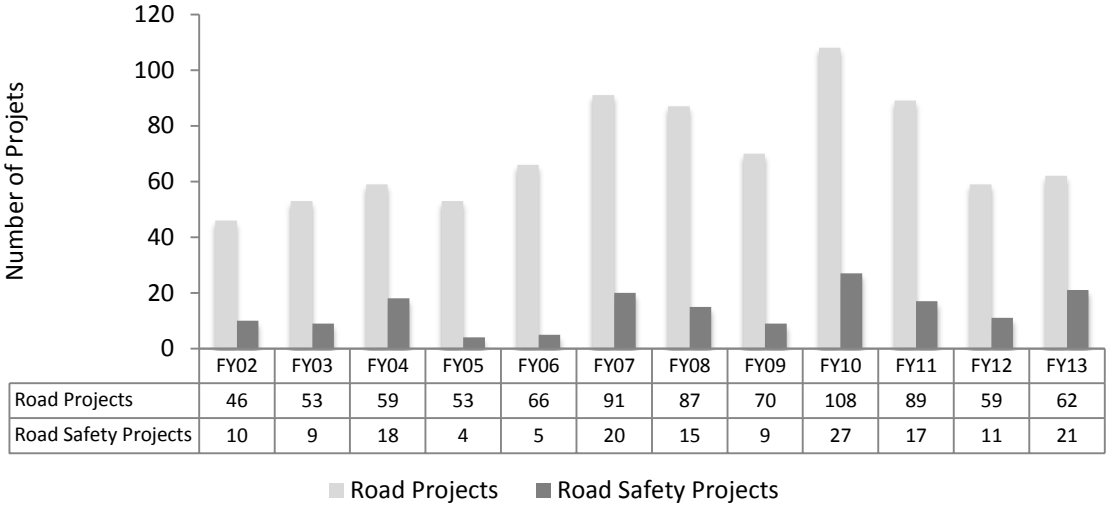
This chapter reviews the World Bank's road safety portfolio and assesses the effects of specific road safety projects. The portfolio analysis is built on the portfolio review conducted by the Global Road Safety Facility (GRSF). The analysis of project effects is based on a review of project implementation documents (Implementation Completion and Results Reports [ICRs] and Implementation Supervision Reports [ISRs]) as well as mission aide memoires, task team leader (TTL) interviews, a client survey, and Independent Evaluation Group (IEG) reports (Project Performance Assessment Reports [PPARs], Implementation Completion Report Reviews [ICRRs], and transport sector studies).

The Road Safety Portfolio Description

The selection of road safety projects was based on a text search that included "road safety," "blind spots," "vehicle safety," "pedestrian walkways," and "awareness campaigns." All intercity highways as well as urban and rural roads projects assigned to the Transport Sector Board were screened. Transport projects assigned to other sector boards were included if the projects had more than a 30 percent transport commitment. Any development policy loans with transport commitments were covered, and non-lending work in road safety was identified and reviewed. Between FY02 and FY13, 843 road projects were approved. Applying the screening criteria above, 166 of the Bank's lending projects—including trust fund (Global Environmental Facility and recipient executed) projects—were identified as having road safety content, that is, road projects with road safety objectives and/or road safety components or activities.

The Bank's support to road safety has fluctuated over time, but there is an upward trend discernable of projects with road safety content. Figure 3.1 shows the support for road safety in detail. The number of road safety projects is expected to grow rapidly in the next few years as the mainstreaming of road safety (that began on June 1, 2013) takes effect.

Figure 3.1. Growth in Road Safety Projects (approved FY02–13)

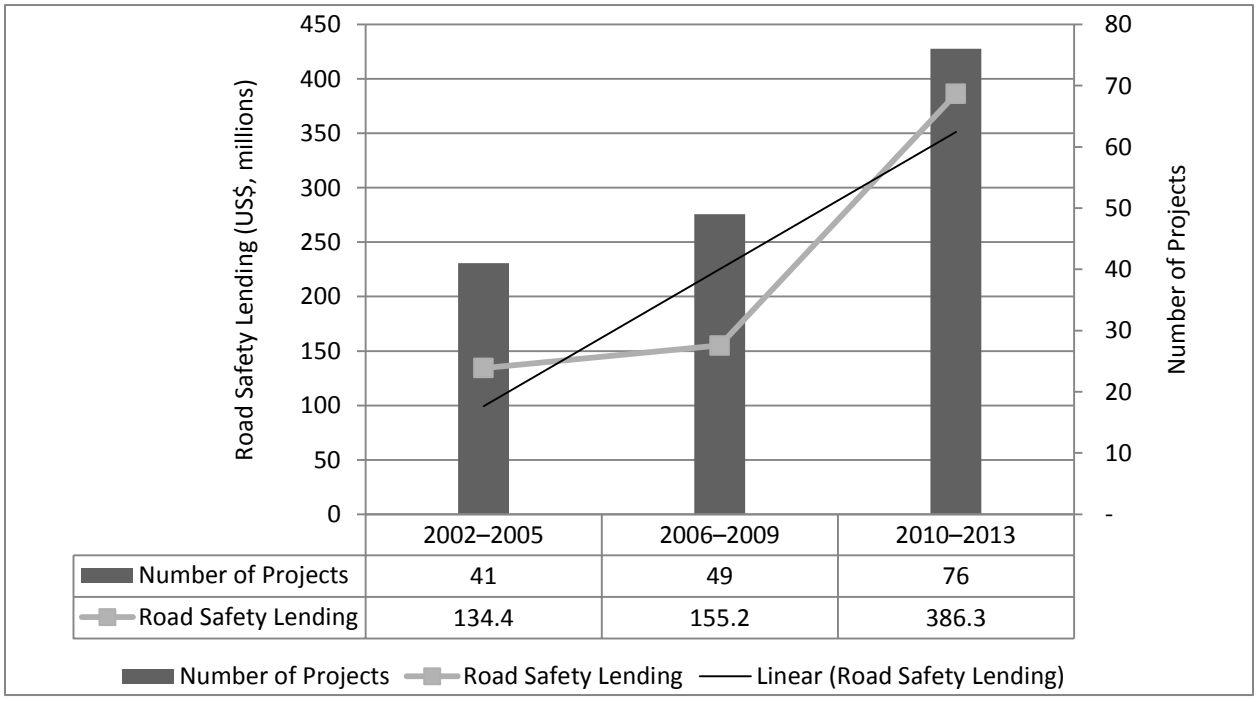


	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13
Road Projects	46	53	59	53	66	91	87	70	108	89	59	62
Road Safety Projects	10	9	18	4	5	20	15	9	27	17	11	21

Source: World Bank Business Warehouse.

Figure 3.2 shows that the amounts spent on road safety have steadily increased. Between FY02 and FY05, the Bank's total commitment for road safety activities (not dedicated road safety projects) is estimated at $134.4 million; it then rose to $155.2 million from FY06 to FY09 and further increased to $386.3 million from FY10 to FY13. GRSF estimates that FY14 road safety commitments are $515 million, which is greater than the previous four fiscal years combined.

Figure 3.2. Road Safety Lending (approved FY02–13)



	2002–2005	2006–2009	2010–2013
Number of Projects	41	49	76
Road Safety Lending	134.4	155.2	386.3

Source: World Bank Business Warehouse.

The Bank's approach to road safety has evolved over time. For earlier projects beginning in 2002 (mostly closed now), the majority of the road safety activities were to eliminate or improve accident black spot (hazardous) locations through engineering works. But a few, notably in Turkey, Poland, Romania, and Vietnam, were first attempts at a more holistic approach to road safety. The Road Improvement and Traffic Safety Project in Turkey (closed in 2003) was one of the first attempts to go beyond black spot improvements and tackle road safety in a more comprehensive way (IEG 2005). The traffic safety component was significant at $78.9 million (more than 20 percent of the total project cost) and comprised civil works for the improvement of black spots; provision of equipment and establishment of an accident data bank for the Turkish traffic police; medical equipment to improve the emergency response time to Gazi University Hospital; and road safety campaigns in selected schools.

In Poland, the Bank supported GAMBIT 2000, the country's integrated road safety program, through financing road safety components in the three successive road maintenance and rehabilitation projects (IEG 2013b). However, the bar for achievement may have been set too low because on accession Poland still had one of the poorest rates in Europe. The Romania Roads II project aimed to produce a 10-year traffic safety plan and a framework for supporting traffic safety research and future programs of traffic safety improvements along with the standard elimination of black spots (IEG 2009). The Road Safety Project in Vietnam—a $35 million dedicated project aimed at reducing road accident rates—was one of the first serious attempts to adopt a safe systems approach in East Asia.

The GRSF study shows that about 66 percent of the active projects feature the safe systems approach, and the percentage continues to grow following the mainstreaming of road safety. In FY12 and FY13, 70 percent of the road safety projects followed the safe systems approach; this number increased to 83 percent by FY14. The flagship is the Argentina Road Safety Demonstration Project, a $38.5 million dedicated road safety project perceived as the best example of the implementation of safe systems guidelines in the developing world to date.

The review of 166 projects revealed 325 road safety interventions covering the five areas from the global plan for the UN Decade of Action: developing institutional management capacity; building safe road infrastructure; improving road safety enforcement and education; influencing policy for improved vehicle safety laws and regulations; and providing for enhanced and more efficient post-crash care. Most interventions are focused on the institutional aspects (129), followed by the infrastructure engineering aspects (106), and road user behavior (43). In IEG's view, the quality of the institutional interventions improved over time as the safe systems

approach was gradually adopted. Some of the earlier interventions were more of a basic training or capacity building nature and not necessarily sustainable.

The Bank is becoming more involved in vehicle safety and post-crash care, areas that currently receive less support compared with the other three pillars of the safe systems approach (infrastructure, institutional improvement, and road user behavior). Of the 325 road safety interventions provided by the 166 projects, 26 interventions concern vehicle safety. The support includes providing facilities for periodic vehicle inspections (Mexico, Mongolia, and Vietnam) and funding the introduction of systems to deter heavy vehicle overloading, which has indirect safety implications (for example, on Cameroon, Mexico, Romania, Tanzania, Republic of Yemen, and many others). Support also was rendered through SSATP on best practices in this area. Assistance to establish a driver and vehicle licensing authority was provided in Ghana. The Bank was a facilitator for the participation of Argentina in the World Forum for Harmonization of Vehicle Regulations, which promotes global best practices in vehicle safety standards. This led to Argentina taking the lead in Latin America by signing an agreement with car manufacturers and importers for the mandatory inclusion of airbags, rear seat headrests, and anti-lock braking systems in all cars sold in the country after January 1, 2014. All new models must also have an automatic lighting system and undergo frontal impact tests. In this area, the Bank could try to expand its assistance to other countries since the return on such initiatives is high. Overall, vehicle safety with only 26 interventions is an area where perhaps the Bank could still do more.

When a road crash occurs in a high-income country, there is normally a fairly swift response from trained emergency services. This is not the case in many developing countries, however, and accident victims may have to wait much longer for assistance due to lack of ambulances and trained staff, poor communication between trauma centers and the police, and traffic congestion severely impeding emergency vehicles. Consequently, people die unnecessarily during the long wait. Before trained help arrives, well-meaning members of the public may try to help but do more harm than good because they are not trained to help. Coordination among the different agencies must be improved to ensure an effective system.

Though the Bank has been involved in only 21 instances of this type of intervention, good cooperation between the transport and health sectors has evolved within the Bank. This started when the Bank and WHO began a dialog and this collaboration led to the 2004 World Report on Road Traffic Injury Prevention. The Bank's support to road safety continued with interventions in Argentina, Tanzania, Turkey, and Vietnam. Emergency response capacity improved in Argentina, including a diagnosis of current capabilities and protocols. In Tanzania, the Southern Africa

Trade and Transport Facilitation Project recently became effective; an effort to upgrade clinics in the road corridor can serve the dual function of providing HIV/AIDS-related services and receiving road accident victims.

The Bank applies the safe systems approach mainly on selected corridors in the client countries due to the limited financial resources it can put into road safety. So far the Bank has given substantial support for 10 safe corridor demonstration projects covering all six Regions, with at least one project in each Region, plus one additional project in the Africa Region and three additional projects in East Asia and Pacific Region. Five more projects have four of the five possible intervention categories. Led by the Argentina demonstration project the safe systems approach is rolling out gradually, but early, positive results are mainly confined to Argentina, Nigeria, and Vietnam so far.

PROJECT DEVELOPMENT OBJECTIVES AND RESULTS FRAMEWORKS

In a presentation to the Transport Sector Board, GRSF figures showed that More than two-thirds of projects with road safety content try to include at least one indicator in the results framework. However, only about 40 percent of road projects now mention road safety in the project development objective (PDO). There is no significant upward trend during the time period of the study for projects that include the road safety component in the PDO and results framework. In a few instances, other development organizations may be covering the road safety aspects, but the Bank is the major player in the majority. The GRSF review found that the inclusion of road safety in the PDO and results framework peaked in FY09 and FY10. Despite a record year in FY13, there was a decrease in the percentage of projects that included road safety in the PDO and the results frameworks from FY12 onward. Assessment of road safety issues in the risk matrix and inclusion in the economic analysis remains comparatively rare.

ECONOMIC ANALYSIS IN ROAD SAFETY PROJECTS

In high-income countries, road safety actions in general yield economic returns ranging from 9 percent to 22 percent, but regrettably no reliable data are available for low- and middle-income countries. Incorporating the benefits of road safety improvement into the economic analysis for Bank projects is also not a common practice. However, some individual Bank projects estimated economic returns by incorporating the benefits of reducing the high level of crashes. The Vietnam Road Safety Project showed returns at closure of between 59 percent and 74 percent; using disability-adjusted life years, the active Argentina Road Safety Project estimates that the economic rate of return (ERR) will be about 122 percent. Few projects exist in

which ERRs are calculated specifically for road safety because, in the majority of cases, the ERRs are for the main road project itself.

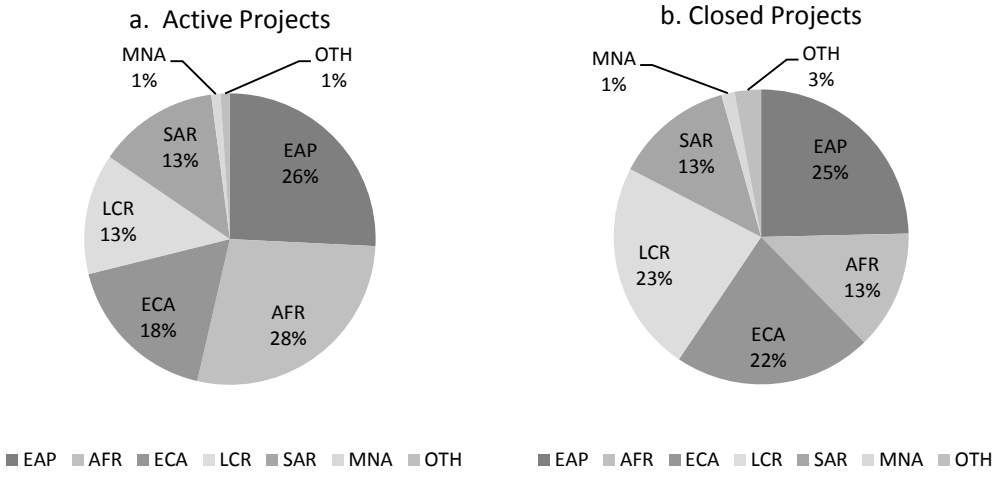
Table 3.1 and Figure 3.3 show that the East Asia and Pacific Region had the most road safety projects, closely followed by the Africa Region and the Latin America and the Caribbean Region. Fewer road safety projects were found in the Middle East and North Africa Region where road safety is not given a high priority. Sub-Saharan Africa has the highest road-related mortality rate per capita, at 32.2 deaths per 100,000 people in 2011 (SSATP 2012).

Table 3.1. Distribution of Road Safety Projects by Region

Region	Active	Closed	Total
EAP	25	17	42
SAR	13	9	22
LCR	13	16	29
ECA	17	15	32
AFR	27	9	36
MNA	1	1	2
OTH	1	2	3
Total	**97**	**69**	**166**

Source: World Bank Business Warehouse.
Note: AFR = Africa; EAP = East Asia and Pacific; ECA = Europe and Central Asia; LCR = Latin America and the Caribbean; MNA = Middle East and North Africa; OTH = other global; SAR = South Asia.

Figure 3.3. Distribution of Active and Closed Road Safety Project by Region



Source: World Bank Business Warehouse.
Note: AFR = Africa; EAP = East Asia and Pacific; ECA = Europe and Central Asia; LCR = Latin America and the Caribbean; MNA = Middle East and North Africa; OTH = other global; SAR = South Asia.

The road safety situation in East Asia and Pacific is better than the Sub-Saharan Africa Region, with a death rate of 18.5 per 100,000 people in 2010. The Bank

financed 24 road safety projects in China alone, which explains why East Asia and Pacific has the most road safety projects. On the other hand, the Bank has financed less road safety-related projects in the Middle East and North Africa than any other Region for various reasons: there are fewer road projects relative to the other Regions; roads and road safety were a lower priority for Bank finance than for other infrastructure; and there is a general lack of road safety expertise in the Region.

With regard to specific road safety interventions, IEG's review found that the largest percentage of infrastructure safety interventions are in East Asia and Pacific and Europe and Central Asia; vehicle safety interventions in Africa and Latin America and the Caribbean; road user behavior interventions in South Asia and Africa; institutional capacity strengthening interventions in South Asia and Europe and Central Asia; and post-crash care in South Asia and East Asia and Pacific (see table 3.2). Results for Middle East and North Africa are not statistically significant because they are based on only two projects during the study period. Interestingly, the pattern for low-income countries compared with the average was similar except that more attention was paid to road user behavior and slightly less to safety engineering. The latter is surprising and may reflect a desire to maximize road length improved at the expense of safety.

Table 3.2. Distribution of Types of Intervention by Region (as a percentage of all Interventions)

Region	Infrastructure Safety Engineering	Vehicle Safety	Road User Behavior	Institutional Capacity Strengthening	Post-Crash Care
EAP	37	5	12	38	8
LCR	33	12	12	40	4
ECA	37	3	11	42	6
SAR	30	6	18	38	8
AFR	26	13	14	41	5
MNA[a]	29	14	14	29	14
All Countries	33	8	13	40	6
Low-Income Countries	30	8	12	46	4

Source: World Bank Business Warehouse and the study team's analysis.
a. Not statistically significant (based on only two projects).

SECTOR DISTRIBUTION

Of 166 road safety projects, 156 are mapped to the Transport Sector Board (Transport and Information and Communications Technology Global Practice) and 10 are mapped to other Sector Boards (Global Practices): nine are mapped to the Urban Development Sector Board (Urban, Rural, and Social Development Global

Practice) and one is mapped to the Water Sector Board. It is an indication that road safety is still viewed (and mapped) as a transport issue. However, there was some cross-sector cooperation on road safety issues; for example, projects including post-crash care now typically include a health specialist on the team. The Transport and Health, Nutrition, and Population sectors are in completely different networks in the Bank's institutional structure and are separate global practices under the Bank's 2014 restructuring. As found in the recent Avian Influenza study, there is significant cooperation between sectors at the strategic level, but some project TTLs reported difficulties in working effectively across sectors, based on a lack of incentives to support this kind of cooperation inherent in the Bank's operational architecture.

LENDING VERSUS NON-LENDING ASSISTANCE

It is more difficult to find information on non-lending road safety activities such as technical assistance and economic and sector work. (Information on lending activities is easily found in the Bank's business warehouse.) To better understand what the Bank has achieved in supporting road safety through non-lending activities, the IEG study team conducted a brief survey of non-lending assistance in the study period (FY02–13) related to road safety in the Bank. Thirty-seven non-lending road safety activities were identified through the data warehouse or from individual TTLs who responded to IEG's request for information about these activities. The documentation for non-lending activities could be improved because in some cases, it could not be found and in others, it contained minimal information, making evaluation difficult. The non-lending activities which contained sufficient information for evaluation had funding amounts ranging from $20,000 to $385,000, with an average of about $100,000; nineteen were in Europe and Central Asia, nine in Africa, six in East Asia and Pacific, two were global, and one was a joint project with Bloomberg Philanthropies that involved Europe and Central Asia, East Asia and Pacific, and South Asia. Many provided funding for road safety capacity reviews, road safety audits, or improving road safety outcomes (see appendix D). Twenty-five of the 37 activities reviewed were closed (about 68 percent). Europe and Central Asia has been particularly active in non-lending activities and more innovative in the non-lending products, which include policy notes, reimbursable advisory services, working papers, and co-financing. The big variety in non-lending products may be due to clients who are more familiar with these types of support, which are common in Europe.

Most, but not all, non-lending activities translated into tangible follow-on activities. The global activities culminated in best practices guidelines and more road safety capacity reviews, and there were specific activities designed to support road safety in transport corridors in Africa. In Europe and Central Asia, a paper on strategies to

reduce accidents through a gender-targeted approach described how a gender perspective could be introduced into road safety strategies, action plans, and data collection tools and procedures. But it is not clear how follow-up on the strategies will occur. There were also road safety action plans, workshop activities, policy notes, and assistance to strengthen strategic planning in Europe and Central Asia. In general, the reviews of the client countries' road safety management capacity produced a wealth of information that appears to be well regarded, but follow-through depended on the degree of government commitment, which varied considerably. The Bank's then Human Development Department (the Health Global Practice), the Sustainable Development Department (the Transport and Information Communication Technology Global Practice), and GRSF produced some joint papers on road safety (Marquez et al. 2010; Marquez and Bliss 2010).

All of this is useful work, but more could be done. There appears to be considerable need for additional capacity building and knowledge enhancement through best practices guidelines. Some areas are still neglected, however. During this study, IEG identified a comparative lack of research on the cost effectiveness of road safety measures in the developing world. Although the impact of typical road safety measures in high-income countries is known, information is scant about the impacts of these same measures in the developing country context. For example, how well do enforcement measures work in countries where petty police corruption is an issue? What is the impact on road safety of the widespread use of minibus taxis, motorcycles, and other types of transport more commonly used in developing countries? More cost-benefit analysis of road safety components should also be encouraged, which likely means conducting further research on the value of life and time in the developing country context and better understanding the impact of seriously injured persons on their households.

The Road Safety Portfolio Performance

As of May 15, 2014, 69 road safety projects had closed (about 15 percent of all closed road projects in the study period), and 97 are still active (about 26 percent of all active road transportation projects).

ACHIEVEMENTS OF CLOSED PROJECTS

The closed projects (69) focused mostly on improving engineering aspects as the main approach for enhancing road safety. The Bank's review of ICRs, IEG PPARs, and related transport studies found that over time, safety engineering had some measure of success in specific road infrastructure projects funded by the Bank and its development partners. Support to develop management information systems,

road design manuals, and black spot elimination techniques improved road safety in the vicinity of the projects, but rarely produced the holistic changes needed to significantly reduce the national accident rates. Human factors were most often neglected overall. There were occasions of failed cases due to inadequate safety engineering design such as the Dhaka-Sylhet Highway in Bangladesh, which was funded primarily by the Bank. *The Guardian* newspaper published an article criticizing the highway's design (*The Guardian* 2012); the newspaper interviewed the regional director of the International Road Assessment Program (iRAP), who pointed to design flaws such as a lack of pedestrian sidewalks, footbridges, traffic signals, speed controls, and crash barriers in the central median to prevent head-on collisions. Also, the main national road in the east-west Central Corridor in Tanzania, which was rehabilitated using Bank financing, has a steep descent in the Singida district that is an unintended black spot. Severe accidents occur at the Sekenke Bridge at the foot of the slope because heavy vehicles sometimes fail to engage low gears, or they simply travel too. The IEG mission in 2011 noted that railings and crash barriers were missing entirely in areas where the accidents occurred repeatedly. Local police records examined by IEG showed that 49 fatalities and 62 injuries occurred at this location since the road was completed in 2008 (IEG 2011).

In spite of that, engineering measures will support the first steps in addressing road safety in countries with relatively weak management capacity and limited financial resources, which is where the change process is likely to be slow. But it is no longer acceptable for the Bank to support highways without appropriate safety features, especially since straightening, widening, and bitumen surfacing of roads all encourage smoother rides and higher speeds. This affects the road users and those living near the road.

Some progress was made in countries that started to adopt a more holistic approach that goes beyond just black spot (hazardous location) improvements, though constraints remain. There are some examples of partial success. The Bank's involvement in Turkey in the Road Improvement and Traffic Safety project (closed in 2003) was one of the first attempts to go beyond black spot improvements and tackle road safety in a more holistic way. By project closure, accidents decreased at black spot sites by 74 percent, and fatalities dropped by 94 percent. The Vietnam Road Safety Project—one of the first serious attempts to adopt a safe systems approach in East Asia—improved accident and fatality rates, but the injury rate reduction was well short of the target. Less successful cases include projects in Poland, where in 2003, the country's safety record ranked 22 out of 25 countries. The Bank's Road Maintenance and Rehabilitation (I, II, and III) made progress and achieved the project target; however, at completion in 2012, Poland failed to reach its

road safety Vision Zero target of a 50 percent reduction in fatalities between 2003 and 2013, and by then the country had the worst fatality rate in Europe (which means that other countries had improved at a faster rate than Poland).

When road safety activity was a component or subcomponent in a closed project, IEG observed that the road safety activities or components were completed at a satisfactory or moderately satisfactory level at least 85 percent of the time, based on project implementation information in ISRs and ICRs**.** However, this did not necessarily have much impact on the national road safety picture.

EARLY RESULTS FROM ACTIVE PROJECTS

Of 97 active projects, 30 were approved before FY10, that is, they were under implementation for five years or more at the time of this analysis. Therefore, some early project results should have been observed, but this review found mixed results. Three of the 30 projects—Bogota Urban Services Project (approved March 13, 2003), Zambia Road Rehabilitation and Maintenance Project (approved March 9, 2004), and Kenya Northern Corridor Transport Improvement Project (approved June 17, 2004) have been in implementation for more than 10 years. The review of these three decade-long projects found that road-safety-related activities were completed, but they have not yet shown any effects because either a good results framework to track project impact was lacking, or the project activities have not yet translated into real effects in the field.

Twenty-seven road safety projects are in their fifth year of implementation or beyond (approved during FY05–09). The projects are in Africa (10), East Asia and Pacific (8), South Asia (4), Europe and Central Asia (3), and Latin America and the Caribbean (2). Most of the 27 projects were related to infrastructure engineering improvements, but it is unclear how many of these improvements would be translated into an improved road safety situation in the countries concerned. Inadequate road safety monitoring is a common issue with these projects. Either they do not report information about road safety (especially projects without road safety objectives or components), or the data are questionable, as in the case of two projects in Africa. Although four of 10 projects in Africa have a road safety objective or dedicated road safety components, only two projects reported on progress in road safety. The Nigeria road safety project reported that fatalities decreased on the specified corridors, but according to WHO (and endorsed by IEG), Nigeria's national road safety record is not improving because the government-provided information relates only to recorded deaths at crash scenes. An ISR of the Ghana Transport Project SIL reported a decrease in fatality rate from 22 deaths per 100,000 people in 2009 to 17.9 deaths per 100,000 people in 2013, but the project team noted in the ISR that the information provided by the client needs to be reviewed.

One of eight projects in East Asia and Pacific has a road safety objective, and none have dedicated road safety components. Four projects have road safety indicators, but the Vietnam Mekong Delta Transport Infrastructure never collected and reported fatality rate information. The Cambodia Road Asset Management project (Asian Development Bank/Australian Agency for International Development) reported that the Road Data Collection Management Unit is in full operation, but its impact on road safety improvement is yet to be seen. Only the China Hubei Yiba Highway project provided information on the improved road safety situation as measured by the reduced accident rate and fatality rate on the project highway section. Note that the Bank's road safety projects in East Asia and Pacific are more urban in context: they pay more attention to pedestrian safety, especially in the vicinity of bus, rail, and metro stations; integrate land management and transport planning into urban transport projects; and promote separated traffic such as buses, cyclists, and non-motorized transport where feasible and affordable.

In Europe and Central Asia, the Ukraine Road and Safety Improvement Project (Bank commitment: $400 million) and the Kazakhstan South West Roads Project (Bank commitment: $2.125 billion) have safety objectives ($44 million) and standalone safety components ($3.5 million). Road safety indicators were included in these two projects, and in the Azerbaijan Highway 2 Project. According to the Ukraine project's ISR, the project reallocated $55 million from the road safety component to the civil works component because the road safety component was moving slowly. Still, the project contributed to improved road safety in Ukraine by eliminating 10 black spots identified by iRAP and by improving a 25-kilometer road corridor that had safety issues. The total number of fatalities per 10,000 vehicles is now five, substantially lower than the revised target and even lower than the initial target. The Kazakhstan project has not yet reported road safety information because civil works are still ongoing. Three of four projects in South Asia (two in India and one in Nepal) reported progress on road safety. The India HP State Roads Project reported a reduction in the traffic-accident-related death rate from 2 per 1,000 vehicles to 0.24. The Nepal Road Sector Development Project reported that its Road Safety Action Plan was developed and approved.

To summarize, of 27 road safety projects in implementation for five or more years, seven have road safety project development objectives or dedicated road safety components, 11 have at least one road safety indicator, seven reported on road safety progress in the client countries, and five countries reported an improved road safety situation in the project areas based on lower accident-related fatality rates. However, ISRs of road safety projects in Africa Region suggest that the road safety data's reliability is questionable. For the rest of the projects, road safety progress

cannot be shown until the road improvement activities are completed and the roads are open for traffic.

Sixty projects approved in FY10 or later were evenly distributed throughout the Regions, except in the Middle East and North Africa where there is only one project in the Republic of Yemen. There are several interesting features of the projects approved during this time:

- There was more emphasis on road safety—especially for projects with at least one road safety indicator—even though progress on road safety could not always be observed until the highway civil works were completed. This feature is more obvious with projects in Europe and Central Asia.
- In general, civil works related to road safety progressed quickly, although with contractual issues in some cases; progress on purchasing road safety equipment was also satisfactory, but getting the equipment installed and operational usually took longer than anticipated.
- The most difficult aspects of projects are developing a road safety policy and strategy and building a road safety institution; a few projects could not make progress even though the client agreed with the process at the project design stage.

Few active projects could report early results on road safety since many are still ongoing. China reported a reduced accident-related fatality rate associated with one highway project in NingXia and an increased accident-related fatality rate on project transport corridors in AnHui due to road user behavior. In time, it is expected that Chinese authorities will focus greater attention on road user behavior and enforcement along with increasing the traffic volume and speed on project highways.

Although work is ongoing in Argentina's $38.5 million dedicated road safety project corridors, early results are encouraging. Average driving speed was reduced by 15 percent between 2009 and 2012; drunk driving rates fell by 50 percent; seat belt use increased by 43 percent; crash helmet use increase by 19.5 percent; the traffic fatality rate dropped by 40 percent (against a target of 20 percent); and the reported traffic injury rate decreased by 18 (against a target of 20 percent). All intermediate results indicators have been met. The innovative nature of the Argentina project is covered in this report in more detail than for other projects since it provides many lessons that are relevant to other countries. The project also created interest in other Latin American countries facing similar challenges (see box 3.1).

Box 3.1. Argentina's Flagship Road Safety Demonstration Project

Argentina's $38.5 million dedicated road safety project was prepared as a collaborative partnership between the transport and health teams in the Argentina World Bank Country Office (Bliss and Raffo 2013). The project has these components:

- Institutional capacity building to provide technical assistance and equipment to assist with the adoption of best international practice;
- The introduction of three demonstration safe corridors ($1.14 million) identified using the International Road Assessment Program;
- Road auditing methodology together with an incentive fund program; and
- The establishment of a road safety monitoring and evaluation system.

In 2008, Argentina created Agencia Nacional de Seguridad Vial (ANSV), a national road safety agency. The federal government's decision to empower and resource ANSV confirmed its position as "owner" of the nation's road safety and manager of related strategic partnerships. The institutional capacity-building component was two-thirds of the total project cost.

The components included: (i) project management; (ii) creation of a national driver license registry system and establishment of a national traffic records and infractions registry; (iii) a five-year strategic plan for ANSV; (iv) communication, awareness, and education campaigns including a plan for national social communications and education campaigns, road safety education kits, grants for eligible nongovernment organizations, and provision of training, workshops, and seminars related to road safety; (v) improvement of emergency response capacity including a diagnosis of current capabilities and protocols and subsequent upgrading, design and implementation of improvements in emergency coordination systems among concerned agencies (such as police, ambulance services, hospitals, and insurance companies), training for emergency response personnel, and acquisition of equipment to facilitate the work of road crash emergency personnel; and (vi) strengthening of the capacity of traffic control and enforcement agencies through the development of training modules, the acquisition of alcohol meters, speed control radar guns, and other radar technology as well as development of a national plan for speed control.

Activities related to educational curricula for primary and secondary schools are being carried out in consultation and cooperation with the Federal Ministry of Education and relevant authorities in participating provinces and municipalities. Activities for traffic enforcement agencies are being carried out through high-level workshops and twinning arrangements organized by RoadPOL.[1] Major efforts are also being made on the emergency response and traffic control fronts, collaborating with other ministries or entities as appropriate. The financial instrument chosen was an adaptable program loan since a follow-up project was envisioned based on defined "triggers" to be accomplished in the first phase; this recognizes that improving road safety outcomes is a long-term process. An important subcomponent was a $10 million incentive program to help participating provinces and municipalities finance innovative road safety initiatives that otherwise would not have been funded because of competition for limited financial resources. To build the results management platform in Argentina's National Road Observatory, the project invested in road safety monitoring systems and tools. The Observatory set up a new data collection system for road crashes, and surveys will provide baseline data for seat belt usage, helmet usage, and distractive factors.

Although the work in the Argentina road safety project corridors is ongoing, early results are encouraging. All intermediate results indicators have been met. IEG believes this project is important from a learning point of view because the project builds upon and reinforces Argentina's

correct sequential implementation of the World Report recommendations. Implementation has not been problem free, however. Originally, three demonstration corridors were selected in discussion with the Argentina Roads Agency (DNV). This is a large organization with the largest budget in the government, but in juggling its multiple responsibilities the chosen corridors slipped down DNV's priority list, forcing ANSV and the Bank to choose different corridors. Unfortunately, this was a backward step because the baseline had been established for the original corridors, which caused some difficulties for the team. However, the Argentina project is also founded on some opportune circumstances including continuing political will at the presidential and ministerial level that followed negative publicity about some major tragic crashes.

A Memorandum of Understanding was also concluded recently to establish a new database covering road safety data for the 20 countries participating in the regional Ibero-American Road Safety Observatory. The database will use indicators for monitoring and comparing progress in reducing traffic-related deaths and serious injuries from the region, and the data will be publicly available. This project is expected to facilitate cooperation among participating countries and serve as an important step to progressively improve data collection and analysis in the region. The database forms part of a policy for the development of effective, evidence-based road safety plans.[2] The Bank initiated regional meetings to share experiences. Capacity assessments have begun with funds from grants made by GRSF and the World Bank Institutional Development Fund (in cases where this is not an existing loan on which to piggyback). Brazil was an early beneficiary. About twenty countries are now participating in this south-south cooperation observatory, supported by a grant of $700,000. Shared historical links and language helped cement the relationship.

About 20 percent of active road safety projects have shown early results, but most of those have not yet revealed the impacts on road safety because civil works or institutional enhancement activities are ongoing. Implementation of civil works components is, in general, smoother than the institutional component, despite contractual issues in some cases. The projects could improve their monitoring—less than 50 percent of the projects have road safety indictors, especially for earlier projects. Projects with road safety indictors still collect and update the information inconsistently, suggesting that project teams and the clients could pay more attention to this area. But enhancing data collection and reporting takes time, so long-term engagement and support will be useful.

CLIENT SURVEY

IEG conducted a brief survey about implementing agencies' views on the Bank's support in road safety and received 12 responses. Many respondents (including Argentina, Armenia, Azerbaijan, India, Kenya and Tanzania) thought that the Bank's support was "much better" than it was five years ago, though some thought it was "somewhat better." For example, the Federal Road Safety Corps in Nigeria said, "There has been a visible impact on the selected corridors in Nigeria with the injection of modern patrol and rescue equipment. The human capacity development too has recorded a tremendous boost." There was also a sentiment that road safety projects financed with Bank funds yielded better results than projects funded by

other sources, probably because of sustainability. The main problems typically experienced include insufficient funding, lack of political support, lack of coordination between departments and agencies, and poor-quality results frameworks and accident data. Negative responses were received from Bangladesh and Ghana, where little or no improvement was observed.

A strong leading agency with sufficient funds and human resources is critical for road safety. However, many developing countries do not have such an agency capable of prioritizing and coordinating a road safety agenda. For example, Sub-Saharan Africa has the highest road-related mortality rate per capita in the world, although less than 4 percent of the world's vehicle fleet is in Africa. A survey conducted by WHO reported that although the majority of African countries (88 percent) have a road safety agency, the government endorsed a strategy with targets and earmarked funding in only 24 percent. In some cases, the lead implementing agency is more concerned with completing the road works portion of the project and neglects the implementation of the safety subcomponents until it is too late to complete them before project closure. The Roads and Bridges Management and Maintenance Project in Mozambique is a good example. This project included physical measures such as pedestrian crossings, signs, road markings, and construction of vehicle inspection centers, along with softer aspects such as road safety audits, training, information programs, and an accident statistics system. But because the National Roads Authority (the lead agency) gave priority to the road civil engineering works, the softer parts of the safety component began too late to complete much of the necessary procurement. At project closure, the road safety situation in Mozambique was not improved, and accidents increased at an even higher rate than the number of vehicles on the roads increased.

In Europe and Central Asia, implementation of the Road Infrastructure and Safety Project in Bosnia and Herzegovina also suffered from the lack of a strong leading agency that would view road safety as a priority. Too many stakeholders were involved in this project, which was later restructured to reallocate funds from the road safety component to the civil works component. The Vietnam road safety project in East Asia and Pacific was also less successfully implemented. One reason was a lack of human capacity in the coordinating National Traffic Safety Committee, which was not empowered to make decisions and did not have sufficient budget, staff, or expertise to exercise the oversight required. Only three countries in the East Asia and Pacific Region have policies that promote walking, cycling, and public transport, and only five countries have policies that separate the infrastructure for vulnerable road users such as pedestrians as a way of protecting them. Eight countries in the Region have a lead agency for road safety, most of which are inter-ministerial committees.

Chapter 4 consolidates the many findings and lessons from this study under broad headings, and thoughts on the way ahead are presented in chapter 5.

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[1] RoadPOL is a global police network that seeks to achieve accelerated transfer of road safety knowledge and experience through training arrangements and peer-to-peer agency reviews.

[2] The International Transport Forum at the Organisation for Economic Co-operation and Development announced this initiative. Participants included the World Bank, the Ministries of Interior of Spain and Argentina, and the Ministry of Health of Mexico.

4. Findings and Lessons

The Independent Evaluation Group (IEG) undertook a study in road safety as a pioneering effort to create a learning product in cooperation with the World Bank's transport operational staff and the Global Road Safety Facility (GRSF). The study's aim is to provide useful knowledge to Bank operational staff involved with road safety, to support Bank and client countries in fine-tuning their road safety strategies and practices, and to support acceleration of the Bank's operational road safety agenda. This report summarizes the study's central contributions to these goals. Each section focuses on a key finding and presents lessons learned.

Variable Progress

To date, the Bank's support improved road safety to varying degrees in several middle-income countries such as Argentina, China, Colombia, Nigeria, and Vietnam. Sierra Leone is an example of a fragile low-income country moving in the right direction. Progress was more modest in some other countries. The brief client survey with two exceptions showed that most implementing agencies observed notable improvement in Bank support for road safety matters between 2008 and 2013.

The Global Road Safety Facility was highly supportive of the Bank's progress in road safety. GRSF has an oversight and training role in the Bank's road safety portfolio; it also provides grants for road safety activities, allocating $17 million in grants. Since 2006, GRSF promoted the safe systems approach globally with support from the World Bank and from other multilateral development banks and donors. An independent evaluation of the facility in 2009 concluded that it was making a difference with limited available resources. However, the evaluation also determined the facility is under-resourced. IEG concurs that GRSF is a highly flexible model and makes good use of its limited resources.

Project Design and Implementation Shortcomings

Many projects were appropriately designed, but in some cases, the project design was too complex for the capacity of the institutions expected to implement it, such as the Vietnam Road Safety Project. The project attempted to cover 63 cities scattered across a wide geographical area—there were too many packages and too many players. This resulted in a challenging procurement process that, given Vietnam's lack of experience with Bank procurement procedures, led to delays and

misunderstandings over ineligible expenditures. In other cases, projects had safety objectives but without sufficient road safety activities to enable achievement of the objectives. For example, the China ShanXi project has a safety objective, but the relevant road safety activities were limited to a road safety audit for the road engineering design without measures to address road users' behavior. It was not surprising that when the new expressway built under the project opened, the accident rate increased due to fast driving.

Implementation of road safety activities, though generally perceived as important, was not always given the priority it deserved. It is not uncommon that in some countries, the lead implementing agency is more concerned with completing the road works portion of the project and neglects implementation of the safety subcomponents until it is too late to complete them before project closure. There are cases where the Bank does not sufficiently contest instances where some clients set a low priority on road safety by maximizing road length completed for civil works activities from the available budget. The Roads and Bridges Management and Maintenance Project in Mozambique is a good example (IEG 2012). This project included physical measures such as pedestrian crossings, signs, road markings, and construction of vehicle inspection centers, as along with softer aspects such as road safety audits, training, information programs, and an accident statistics system. But because the National Roads Authority (the lead agency) gave priority to road civil engineering works, the softer parts of the safety component began too late to complete much of the necessary procurement. At project closure, the road safety situation in Mozambique was not improved, and accidents increased at an even higher rate than the number of vehicles on the roads increased. In the Europe and Central Asia Region, implementation of the Road Infrastructure and Safety Project in Bosnia and Herzegovina also suffered from the lack of a strong leading agency that would view road safety as a priority. Too many stakeholders were involved in this project, which was later restructured to reallocate funds from the road safety component to the civil works component.

A good results framework is a crucial factor for the Bank's road safety projects. The GRSF found that about two-thirds of the Bank's road safety projects included at least one indicator on road safety; however, there was no clear upward trend of including road safety in the project development objectives and the results framework. The IEG review of the active projects also found a few with a road safety objective but without any road safety indicators, and in many projects, the data were not consistently collected and reported. In the Second Wuhan Urban Transport Project in China, a "fatality reduction on the five road safety corridors" was a project development objective indicator, and the baseline value for this indicator was 38 deaths per 100,000 people in December 2008. However, the value for this indicator

remained the same in December 2013. The Mali Transport Sector Project has one road safety indicator—number of pedestrian accidents. Although the data were collected and reported, the numbers kept changing, which raised questions about the collection methodology and the usefulness of this information to monitor project achievement. Monitoring of the Vietnam Road Safety Project received the following management comment: "The results framework as designed in the PAD is best practice in the Vietnam portfolio. In the ISR however, some of the good key performance indicators were dropped—e.g., the intermediate outcome indicators on road safety behavior, compliance with vehicle standards, as well as road safety reporting. To enable an objective assessment of progress, it is suggested that all relevant indicators (and targets) be reported in the ISR." Sometimes a project added a road safety component during project restructuring, but the road safety indicator (fatality rate) was dropped and replaced with output indicators. The Nigeria Federal Roads Development Project replaced it with two output indicators: "Number of pedestrian over-bridges constructed" and "FRSC [Federal Road Safety Corps] implements safe corridor approach in at least two corridors." The Mali Second Transport Sector project also dropped its road safety indicator during implementation.

However, it is unfair to assume that data collection is the Bank's sole responsibility. In many cases, road accident statistics in client countries are so poor that it is difficult, if not impossible, to establish a proper baseline. In such cases, an immediate priority is to create a crash database and train police to improve accident reporting. Outputs indicate at least some level of progress, but it is important to work toward outcome performance indicators because the project has limited value if results cannot be demonstrated—however good the project may be.

Results frameworks are improving in general. But when there are weak results frameworks at the project design stage and inadequate project monitoring at the implementation stage, the result may have attribution issues and lead to a project claiming an achievement for which it was not responsible. The Romania Roads II project could be an example. The project aimed to produce a 10-year traffic safety plan and a framework for supporting traffic safety research and future programs of traffic safety improvements, along with the standard elimination of black spots. Although it seemed reasonable at the time to relate a declining national road accident fatality rate to these measures, IEG pointed out in its evaluation of the project that there was a serious attribution issue. National fatality rates were already falling, so it is more likely that engineering measures on 1,000 kilometers of road funded under a previous Bank transport project were responsible for the drop in fatalities. But other factors likely had an impact such as less driving due to the recession. This does not mean that the national fatality rate cannot be used as an

outcome indicator—only that it should be measured correctly, and that we should collect additional data to draw conclusions about attribution.

Insufficient Funding

Road safety still lacks a highly visible profile and does not attract sufficient funding. Although the Bank's commitment to road safety activities had an upward trend in recent years, this review found that on average the Bank commits only about 3 percent of its transport investments to road safety activities. In a few cases during the project implementation, road safety funds were reallocated to more civil works activities either because the client did not view road safety as a priority, or the progress on road safety activity was too slow at the same time the civil works activities encountered cost overruns. As the Bank continues to mainstream road safety, resources devoted to road safety should be increased accordingly. Project supervision should ensure that safety components start early in the project and not be delayed to the point that there is a serious risk they might not be completed. This aspect should receive particular attention at the project's mid-term review.

Research Gaps

During this study, IEG also identified a comparative lack of research on the cost effectiveness of road safety measures in the developing world. Road injuries cause more loss of life and disability-adjusted life years than tuberculosis or malaria, so it is urgent to explore this area. Although the impact of typical road safety measures in high-income countries is known, information is scant about the impacts of these same measures in the developing country context. For example, how well do enforcement measures work in countries where petty police corruption is an issue? What is the impact on road safety of the widespread use of minibus taxis, motorcycles, and other types of transport more commonly used in developing countries?

Strong Government Commitment as a Key to Success

Despite strong resolutions about the importance of road safety, **it is difficult to gain commitment from developing country governments to allocate sufficient resources to this complex problem and give it priority over a sustained period.** For example, the Second Wuhan Urban Transport Project in China experienced continuous slow progress in implementing its public transport and road safety components due to a change in the city government's priorities. Another example is

the Nigeria Federal Roads Development Project, which had a project development objective "to reduce passenger travel times, vehicle operating costs and traffic related fatalities on targeted federal roads and assist the government to manage Nigeria's federal road assets in a sustainable manner." The project made little progress for the first two years because "the government continued to show little ownership for the project, especially for the reform component," and "in discussions with the new Minister of Works, it was clear that the Minister was not committed to the reform program and did not see carrying out the reform programs as a priority during the current election year.… Yet, without the planned sector reforms, the road sector in Nigeria will continue to suffer from poor governance and unsustainable funding arrangement." The project was later restructured when a $20 million road safety component was added, which shows that road safety now has a higher priority on the government agenda.

A strong leading agency with sufficient funds and human resources is critical for road safety. However, developing country governments are typically not strong on inter-ministerial coordination. For example, a survey conducted by the World Health Organization (WHO) reported that although the majority of African countries (88 percent) have a road safety agency, the government endorsed a strategy with targets and earmarked funding in only 24 percent. The Vietnam road safety project was less successfully implemented because the coordinating National Traffic Safety Committee lacked human capacity, for one reason. The Committee was not empowered to make decisions and did not have sufficient budget, staff, or expertise to exercise the oversight required. Overall, in the East Asia and Pacific Region, only eight countries have a lead agency for road safety, most of which are inter-ministerial committees.

Effective traffic law enforcement is essential for road safety in developing countries, but this poses problems for TTLs who are used to interfacing with traditional transport sector clients such as road agency and works officials. Traffic police departments fall outside this framework and often resist changes to their operational activities. In Georgia, a TTL met resistance in this area and found on investigation that the issue was not that the traffic police department was unwilling to record additional accident data, but rather they lacked sufficient tablets to electronically record the required information. In some countries, corruption was found to be an issue—for example, pocketing unofficial on-the-spot fines. An idea to combat this type of behavior and strengthen traffic enforcement agencies is being carried out through high-level workshops and twinning arrangements organized by the global police network RoadPOL. Still in its infancy and encouraged by the GRSF, RoadPOL organizes training and peer-to-peer agency reviews to accelerate transfer of road safety knowledge, culture, and experience. The Bank also assists traffic

police by adding equipment subcomponents to projects (in Kiribati, the Russian Federation, Turkey, and many others).

Relevant Lessons from High-Income Countries

In Europe, the "big four killers" targeted in road safety campaigns are speeding, jumping red lights, not using seat belts, and drunk driving. These areas are similar for virtually all countries, according to the Global Status Report on Road Safety (WHO 2013b). Although structures may differ, **the general characteristics of road safety organizations in high-income countries include a strong central lead agency that coordinates with a wide range of stakeholders** (see appendix A for a summary of case studies by country). In this structure, there is usually secure and sustainable funding, progress is measured through a rigorous results framework, and a shared vision to reduce death and injury rates is strongly supported at the political level.

There are many lessons from high-income countries that can be applied in developing countries, but the contexts are still dissimilar. The traffic composition in developing country cities is different and includes a greater number of two-wheelers (scooters, bicycles, and motorcycles) three-wheelers (rickshaws), and non-motorized vehicles such as animal-driven carts. There is also a large number of pedestrians and sometimes stray animals. Safety features such as pedestrian crossings or dedicated lanes for specific types of vehicle are scarce. The safety of vehicles is sometimes questionable, and road user discipline may be poor. Workers frequently ride in open trucks or pickups that are not designed to carry large numbers of people. Taxi drivers can drive aggressively and stop without warning to pick up or drop off passengers. Road design standards often originate from those used in developed countries decades ago and may be unsuitable for developing country conditions. Parking rules might not exist or are poorly enforced if they do. There are also competing priorities for scarce funds and insufficiently trained people in law enforcement, emergency response, and implementing agencies. Governance issues and lack of project results frameworks are also problems. The situation is bleak, and it is the reason for the high road accident rates in developing countries.

High-income countries have considerable resources to apply to improving road safety, but this does not mean that developing countries cannot adopt many of the best practices. Even when constrained by lack of capacity, it is feasible for developing countries to move in the right direction, and low-cost measures that are more easily implemented can result in significant improvement in their accident statistics. These measure include road reflectors, line stripes, crash barriers, signs, utility poles that break away on impact, and crash barriers at dangerous spots (for

example, Uruguay Road Rehabilitation and Maintenance Project and Zambia Road Rehabilitation and Maintenance Project (phase 2). Where traffic volumes are high, the construction of a central median barrier is effective in reducing head-on collisions (as in Belarus Road Upgrading and Modernization, Peru Lima Transport Project, and Ukraine Road and Safety Improvements). In urban areas, traffic management measures include roundabouts and separating different types of traffic where feasible, such as pedestrians, cyclists, buses, and taxis (the Liaoning and Anhui Medium Cities projects in China). In larger cities, synchronized traffic signals (Bangladesh, Urban Transport project) and an appropriate parking policy (as in the Mauritius Infrastructure Project and the Russian Federation Moscow Urban Transport) can improve traffic flow and lead to safer travel. In Bangladesh, the average speed of buses in central Dhaka was improved by 7 kilometers per hour after traffic signals were introduced at 68 intersections, and rickshaws were banned on certain routes (IEG 2007b). This improved congested traffic conditions and attracted more riders to safer public transport modes.

Change Takes Time

Engagement needs to be focused and persistent. It took highly resourced developed countries two decades to significantly reduce their accident rates, and it will conceivably take at least as long, if not longer, for less well-off countries to follow suit. For road safety aspects, the risk to development out-come is often underestimated because project discussions are frequently more concerned with the sustainability of larger road works components at the expense of road safety aspects. Therefore, it is important for the Bank to provide effective and continuous support to reinforce the progress made in road safety and to introduce new measures.

5. The Way Forward

The year 2015 will be important for the Bank's reputation as a premier lender in the road safety field because this is the midpoint year for the UN Decade of Action. Progress is recorded but not in all countries, and it is unlikely that the ambitious goals set for the decade can be met unless the initiative moves forward swiftly and substantial additional funding is deployed. The Commission for Global Safety drew attention to donors' comparative neglect of road safety and recommended that 10 percent of all road infrastructure funding should be committed to safety in the future. This study found that the World Bank's road safety projects committed about 3.5 percent of the project funding on road safety activities (which falls way short of the 10 percent recommendation). The study proposes the following way forward:

- **Make a bolder commitment to road safety that includes more financial support.** There are several global initiatives seeking funding, including climate change, disaster risk reduction, and improved water and sanitation, but all are falling short of their targets. Mobilizing funds for road safety is similarly difficult, despite the carnage on the roads. Unlike campaigns to stop the spread of infectious diseases, where private sector funds are readily available because of the profit incentive in the pharmaceutical industry, roads are largely a public sector good. Attempts to secure funds from the insurance and motor manufacturing industries have had limited success so far, but that does not mean this avenue is closed. Bilateral and multilateral development institutions are still the obvious source of funds, and the World Bank is seen as the premier institution with a strong leadership role. Selecting an arbitrary percentage target for road safety funding would be a mechanical solution; however; clearly the Bank needs to make a bolder commitment and give GRSF more support, including financial support. This would likely involve high-level stakeholder meetings and perhaps engaging professional fundraisers.
- **Update the Bank's transport business strategy.** Although the GRSF strategic plan is recent, the transport sector business plan is out of date. A new plan will likely reflect the framework of the reorganized Bank in relation to global practices and cross-cutting solution areas. The Bank's next transport business strategy could also benefit from considering three things: the implications of scaling-up road safety activities; the need for collaboration across Global Practices such as Health, Transport and Urban, Rural and Social Development; and the effectiveness of the safe systems approach.

- **Improve project design and focus more on the implementation of road safety activities.** Safety aspects, where applicable, should be included in project objectives, and road safety components should be self-standing. Appropriate due diligence to mitigate for speed and other factors should be mandatory, and the local community should be consulted on the road safety aspects of the project. Better project supervision can ensure that safety components start early and are not delayed to the point that there is a serious risk they might not be completed. This aspect could receive particular attention during the project's mid-term review. Designing a good results framework is another crucial factor, since progress cannot be measured without performance indicators. On the borrower's side, if the country has poor road accident statistics, an immediate priority is to create a detailed crash database of accidents that occur and train police to improve accident reporting. On the Bank's side, the effectiveness of different measures should be recorded to improve best practice.
- **Accelerate toward the road safety "tipping point."** A road safety tipping point is reached when governments and the public start to treat road safety as a major priority. Experience suggests that often a tipping point is reached only after a series of terrible crashes arouses public anger pressures politicians to take action, as evidenced in Argentina and Turkey. In developing countries, especially where affected people have less voice, the Bank needs to be persistent in advocating for road safety measures and could discuss the need for improved road safety with its clients at the highest levels of government. Engaging nongovernmental organizations could also be critical in shaping public opinion and influencing the government.
- **Enhance the Bank's own road safety knowledge.** As the Bank mainstreams road safety, it is expected that the number of interventions in vehicle safety, road user behavior, and post-crash care will increase. The Bank should introduce a database to record the experiences of the application of various road safety measures in its projects. This may involve encouraging borrowers to continue recording data even after the project is closed. It could also encourage partners, clients, and other stakeholders to contribute information from non-Bank-financed projects. The Road Safety Observatory being implemented in Latin American countries deserves strong support and could be replicated in other Regions.
- **Set minimum safety requirements.** IEG proposes that the Bank should never finance an unsafe road, even if this means the project will cost more. In particular, safety aspects should be part of the acceptance process at the detailed design and pre-opening stages and should be emphasized in the Guidelines for Road Safety Management Capacity Reviews and Safe System

Projects (Bliss and Breen 2013). The design should account for appropriate due diligence to mitigate for speed and other factors, and the local community should be consulted on the road safety aspects of the project. Although making road safety a safeguard could be considered, such a move may not be feasible at this time. However, there is a strong argument for introducing mandatory road safety audits linked to road investment loans or credits. A simplified version may be needed for low-capacity countries, but an audit requirement would still be essential. Efforts should also be made to ensure that discussions with the public about a proposed road scheme include road safety implications and potential remedial measures. Funding for these activities could either be part of the loan or grant or take the form of a project preparation facility.

- **Innovative ideas need to be copied where appropriate.** An example is an important subcomponent of the Argentina Road Safety Project, which included a $10 million incentive program that helped participating provinces and municipalities finance innovative road safety initiatives that otherwise would not have been funded because of competition for limited financial resources. A similar Challenge Fund was instituted in India in the Kerala State Transport Project 2.

  Road safety interventions should be appropriate for the country's circumstances. Every country is different, and although the principles behind success in road safety are tried and tested, their application must be customized to fit each individual case. A dedicated road safety project like Argentina's is ideal, but low-income countries (which often have small economies) may be able to afford only one transport project at a time, given the availability of donor funding and limited in-country capacity. This is especially true for fragile states that may have suffered major natural disasters (Haiti) or years of civil conflict (Liberia). In some of these countries, progress may not be possible until conditions have stabilized, but once this happens, the first steps of a safe systems approach may be introduced. This includes establishing a coordinating lead agency, assessing the extent of the work to be done, and preparing a national plan of action. Politicians want to see speedy and visible progress, and it is important for a quick "win." This can be achieved by identifying the low-hanging fruit—find out what measures to reduce accidents will be most cost effective, visible, and easy to implement.

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Appendix A. Case Studies from High-Income Countries

Table A.1. Road Traffic Deaths and Motor Vehicle Population for 25 High-Income Countries with a Population Exceeding 5 Million

Countries (population exceeding 5 million)	Population (2010)	Road traffic death rate per 100,000 population (2010)	Registered motor vehicles (millions, 2010)[a]
United States	310.3	11.4	259.0
Japan	126.5	5.2	89.9
Germany (5)	**82.3**	**4.7**	**50.2**
France	62.8	6.4	34.3
United Kingdom (2)	**62.0**	**3.7**	**35.2**
Italy	60.6	7.2	52.9
Republic of Korea	48.2	14.1	19.7
Spain	46.1	5.4	31.1
Canada	34.0	6.8	21.4
Saudi Arabia	27.5	24.8	6.6
Australia	22.3	6.1	16.1
Netherlands (3)	**16.6**	**3.9**	**9.3**
Greece	11.4	12.2	7.9
Belgium	10.7	8.1	7.1
Portugal	10.7	11.7	8.7
Czech Republic	10.5	7.6	7.3
Hungary	10.0	9.1	3.6
Sweden (1)	**9.3**	**3.0**	**5.2**
Austria	8.4	6.6	6.1
Switzerland (4)	**7.7**	**4.3**	**5.5**
UA Emirates	7.5	12.7	2.3
Israel (5)	**7.4**	**4.7**	**2.5**
Denmark (7)	**5.6**	**4.8**	**3.1**
Finland	5.4	5.1	5.3
Singapore	5.1	5.1	1.0

Sources: Primarily World Health Organization (WHO) Global Safety Status Report and World Bank data.
Note: The seven best performers are indicated in bold.
a. Excludes two-wheelers.

For the high-income countries, seven (marked in bold) have achieved a road traffic death rate per 1,000 persons of less than five. Sweden has the best record followed by the United Kingdom (UK), the Netherlands, Switzerland, Germany, and Israel. The worst are Saudi Arabia, the Republic of Korea, the United Arab Emirates, Greece, Portugal, and the United States. With the exception of Saudi Arabia, which demonstrates that ample financial resources alone do not necessarily lead to good road safety practice, these results are much better than for the majority of

developing countries, largely due to the degree of acceptance and implementation of the safe systems approach.

Australia

Australia has a National Road Safety Strategy (2011–2020), agreed to by all its states and territories, which was drawn up and is administered by the Australian Transport Safety Bureau on the basis of the safe systems approach. The Department of Infrastructure and Regional Development has a range of functions that support the Australian government's role in road safety. These include administering vehicle safety standards for new vehicles, administering the National Black Spot Program and other road funding, administering the "keys2drive"[1] and "Seatbelts for Regional School Buses" programs, producing national road safety statistics, and coordinating the National Road Safety Strategy.

The state of Victoria, which has the highest density of roads of any state in Australia, has long been regarded, nationally and internationally in road safety policy. Its death rate per 100,000 people has dropped from 31 in 1970 to 5.4 in 2012, according to the Australian Bureau of Statistics. This has been achieved primarily through a strategy of setting and securing compliance with key road safety rules. Large numbers of road users are subjected to random breath tests or cameras check their speed. This has resulted in acceptance over time that the restrictions are in the public interest. The enforcement regime was supported through the advocacy of opinion leaders from the medical profession and academia, and especially in the earlier years by the media. The Victoria Road Corporation manages coordination of road safety matters and crucially ensures dedicated funding sources for road safety including the National Road Fund, revenue raised from the compulsory state injury insurance team, and revenue from speed and camera fines. When the insurance levy was first introduced, it was set at 3 percent of the injury insurance premium and then raised to 10 percent, yielding about $20 per motor vehicle.[2] Currently the levy brings in more than $1 billion annually to assist persons with road accident injuries and is administered by the Transport Accident Commission.[3]

Unlike Victoria, which has a road authority lead agency, Western Australia has a stand-alone lead agency in the Premier's Department. Western Australia is very different from Victoria in that it is much larger in extent, and has a substantially lower road density. It moved to a results-orientated focus in 1997 and adopted the safe system approach in 2003. In 2009, it adopted the Towards Zero strategy along the same lines as Sweden's Vision Zero. Output targets are not specified in the road safety strategy, but are set in the annual performance agreement of the Office of

Road Safety. Several sources of road safety funding in Western Australia comprise a Road Trauma Trust Fund, a sponsorship contribution from the government's personal injury insurer and central and local government funding allocations.

Great Britain

As in the Netherlands, Great Britain has a lead road safety department in the Transport Ministry. It works with governmental partners in Scotland and Wales. There is a long tradition of systematic road safety work that started in the mid-sixties to turnaround worsening road accident statistics. By 2010, Britain achieved the lowest road death rate after Sweden. In recent years, road safety has also been integrated increasingly into other government objectives concerning, for example, security and the environment. Great Britain has achieved one of the lowest national per capita death rates in the world. This safety record is attributed to a long process of applying a range of engineering, enforcement, and education measures in a cost-effective manner to clear pre-set targets. National best practice guidelines and codes of practice have been drawn up based on experience with local authority implementation. A forty percent reduction in deaths and serious injuries in the vicinity of high-risk crash sites has been achieved where safety cameras have been installed. As in Australia, the Netherlands, and Sweden, strong parliamentary interest and support for road safety has been a key factor in achieving progress in road safety. There is also an ongoing program of research supported by the business sector into in-depth investigations into actual car crashes, leading to improvements in safety design features to help mitigate injuries to occupants and other road users. As in the other countries mentioned, there is a robust legislative framework, which is subject to periodic review. There is also a "challenge fund" to assist with the costs of projects promoting road safety proposed by organizations other than local authorities.

Japan

According to the WHO Global Status Report in 2010, Japan had a road traffic death rate of 5.2 per 100,000 persons. Traffic deaths have been declining since 1989 when there were more than 11,000. In 2011, the number of traffic-related deaths was 4,611. However, although traffic deaths have declined, traffic accidents have not. The figure was 661,000 in 1989, but was 691,000 in 2011. More significantly, the number of traffic-related injuries has increased slightly from 815,000 in 1989 to 854,000 in 2011.[4] Japan has a dense population, road network and 90 million registered vehicles. Administration is through the Bureau of Road Transport within the

Ministry of Land, Infrastructure, Transport, and Tourism. The Traffic Safety Policies Law in Japan requires the government to report each year on the status of traffic crashes, on measures being implemented and on plans for traffic safety measures. This is contained in the "White Paper on Traffic Safety in Japan."[5] Expert panels develop "Fundamental Traffic Safety Programs" (FTSP) every five years. The eighth FTSP (2006 to 2010), for example, acknowledged the need to respond to Japan's changing demographics (i.e., declining birthrates and an aging society. The focus was on improved pedestrian safety and raising people's awareness of road safety issues.

The common philosophy of the eighth FTSP was:

- Our aim is a crash-free society.
- Give people precedence: a "people first" philosophy considers those who are weaker than others.
- Deal with the issue of human error in public transportation: by improving the organizational structures and systems of companies providing transport services.
- Encourage participatory traffic safety activities by enabling citizens to participate in the planning stages of traffic safety measures run by national and local authorities.

"Safer road networks" are implemented in Japan (both for new road construction and reconstruction). As a result, the extent of the road network with a low crash rate is constantly expanding. Under a new procedure, a set of target figures for reductions in crashes is determined first, then the types of countermeasures required to achieve those annual targets are selected.[6] The Japanese road network is targeted at three different levels by developing routes for the improved coexistence of pedestrians and vehicles; creating zones where pedestrians and bicycles have priority and by implementing arterial road measures: including the placement of right-turn lanes; intersection improvements; securing parking space; regulation of illegal parking and installing light emitting diode (LED) traffic signals. "Safe Pedestrian Areas" have been identified and have become the focus of area-wide crash prevention measures (measures to limit travel speeds, to alert drivers to road characteristics, and to demarcate sections to be used by traffic and by pedestrians). Wide sidewalks have also been developed along school routes, around train stations and other public facilities. Japan tries to eliminate utility poles, construct pedestrian overpasses with lifts, implement rest areas for pedestrians and facilities to park bicycles, and improve signs and markings to make them more visible to the elderly.

Netherlands

Netherlands has a lead road safety department within the Transport Ministry, which interacts with the European Union (EU) on European safety matters. However, road safety is highly decentralized with regional and local governments drawing up plans for implementation in their jurisdictions, while national government supports them with road safety knowledge and funding. The Netherlands is a world leader in road safety performance and for innovation in road safety engineering. The country has spelt out a vision known as Sustainable Safety, similar in nature to Vision Zero. It recognizes that the system needs to take into account human limitations. One of the principal goals of the policy is to achieve a uniform and self-explanatory national system of speed limits. It has three guiding safety principles, which are:

- Functionality—to prevent unintended use of the infrastructure,
- Homogeneity—to prevent major variations in speed, direction, and mass of vehicles at moderate and high driving speeds, and
- Predictability—to prevent uncertainty among road users.

A clear hierarchy in terms of speed management has been established, which includes changes in rules about priorities for different categories of road user. Nongovernmental organizations (NGOs) representing cyclists and pedestrians are encouraged to play a strong role in the planning and promotion of road safety. Whereas in Sweden Vision Zero was driven by public health considerations in the first instance, investment in road safety to reduce socio-economic costs is the key theme of Sustainable Safety. Road safety funding is nowadays based on resources allocated from the Netherland government's general tax revenues, but the results framework including targets to be met ensure that road safety is given a consistently high priority.

Sweden

Sweden is the global leader in best practice. Among the reasons for this is its long tradition in road safety work and that road safety is truly a national priority. Road safety is fully integrated into urban planning and legislation underpins a long-term goal and interim road safety targets for motivating and involving a broad spectrum of stakeholders.[7] Since 1997, Sweden has been working toward its highly ambitious goal, known as Vision Zero, to eliminate death and serious injury in its road traffic system. The strategy is a key driver of innovation and is based on well-established safety principles and a results focus, which is also being adopted in varying degrees by other high-income countries. The concept is akin to the approach used in the

aviation industry to minimize air crashes. Vision Zero basically says that the loss of life in road accidents is unacceptable and that the road system must be designed to take account of human error, which has also become a goal in the Swedish national transport policy. It is notable that the related aim of the Swedish car company, Volvo, is that by 2020 nobody will be seriously injured or killed in one of its new vehicles and that in the longer term cars should not crash at all.

Sweden is unique in that for enforcement of traffic regulations the individual driver rather than the vehicle must be prosecuted. In practical terms, this means for speeding it is not sufficient for a camera to capture the offending vehicle's number plate; there is a requirement to prove who was actually driving the vehicle at the time the offence was committed. This means that the driver as well as the number plate must be recognizable.[8] In addition, the cameras are only positioned where they are required for safety reasons, thus eliminating the perception that the fines are just another form of tax on the motorist. This has the support of the general public. Overall adherence to speed limits has improved from 50 percent in the late nineties to 80 percent currently, and 95 percent or better at camera sites.

This evidence is corroborated by a study in the UK by the Royal Automobile Club Foundation, which analyzed data from 551 fixed speed cameras in nine areas. The findings revealed that the average number of fatal and serious collisions near a speed camera fell on average by more than a fifth after it was installed.[9] When evaluating the financial benefit derived from such cameras, the savings from preventing accidents and injuries far outweigh the revenue raised by imposing fines on speeding drivers and the cost of the camera installations.

Vision Zero is relevant to any country that aims to create a sustainable road transport system and not just wealthy countries.[10] Sweden was one of the first countries to establish a results framework, which included intermediate outcome targets such as increasing seat belt usage, percentage of vehicle kilometers of driving exceeding speed limits, percentage of cyclists wearing helmets, and pedestrians and cyclists using reflective clothing, average response time for emergency services after a crash, and percentage of drivers above the legal alcohol limit in police checks. While purchase and maintenance of enforcement equipment may be costly, a number of relatively inexpensive actions can be taken that will make roads safer. These are shown in box A.1. Vision Zero is coordinated and promoted by a National Road Safety Assembly. Responsibility for road safety lies with central government, which develops the main long-term road safety strategic guidelines. These are translated into implementation programs at regional level with regional authorities liaising with local government and municipalities. The National Police Board coordinates national road safety policing strategy carried out by local police

authorities. Organized business and NGOs are encouraged to become involved in road safety.

Box A.1. Simple Measures to Save Lives

1. Separate categories of road users where possible, especially in urban areas.
2. Install central crash barriers at dangerous locations on highways.
3. Convert dangerous intersections into roundabouts.
4. For older highways, place guard rails at steep cliffs and replace rigid posts and guardrails with types that yield.
5. Review speed limits on national roads and adjust to the safety standard of the road.
6. Ensure vehicles are fitted with seat belt reminders.
7. Introduce campaigns to increase use of helmets for two wheeled riders.
8. Train professional drivers in first aid.
9. Encourage companies to adopt safe travel policies, demanding that employees abide by the speed limit, use seat belts, and not to drink and drive.
10. Enforce speed limits at dangerous locations.
11. Introduce legislation to ensure that locally manufactured or imported new vehicles meet appropriate safety standards.

Lessons for Developing Countries from High-Income Countries

While structures may differ, the general characteristics of road safety organizations in high-income countries include a strong central lead agency, which coordinates with a broad range of stakeholders. There is normally secure and sustainable funding, progress is measured through a rigorous results framework, and there is a shared vision strongly supported at political level to reduce the rates of death and injury. Although high-income countries have considerable resources to apply to improving road safety, this does not mean that developing countries cannot adopt many of the best practices. Even when constrained by a lack of capacity, it is feasible for them to move in the right direction. The more easily implementable low cost measures can result in a significant improvement in their accident statistics.

In Europe the "big four killers" to be targeted in future campaigns are speeding, jumping red lights, not using seat belts and drink driving, and these areas are likely similar for most countries.[11] Innovations and improvements in technology will also eventually trickle down to many developing countries including LED stop signs, shorter crash cushions and improved vehicle design to prevent rollover accidents. Argentina has shown through its links with Spain that an appropriate twinning arrangement can be a significant factor in helping to strengthen its capacity. China has also demonstrated that a strong policy with regard to children and road safety can be highly beneficial. Nevertheless, developing countries have different characteristics and policies need to be adapted to each country's specific

circumstances. In all countries, though, a strong lead agency is a critical prerequisite and its establishment and together with adequate resourcing signals recognition by the government that road safety is important. Road Safety enjoys a high profile, in most high-income countries, with political support at the highest levels. For example, the Prime Minister of Japan chairs the Central Committee on Traffic Safety Measures responsible for formulating its Fundamental Traffic Safety Programs. Such political support usually translates into funding provision. General awareness campaigns to influence road user behavior are not the norm anymore. Rather, a more targeted approach to specific groups is used. Analysis is undertaken to determine the details of the problem, details of the message, and the target audience, and how to ensure that audience sees the message.

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[1] Keys2drive is a learner driver program run by the Australian Automobile Association and funded by the Australian government. The program provides one free driving lesson with an accredited instructor, to learner drivers accompanied by their supervising drivers.

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[9] Royal Automobile Club Foundation. 2013. *Deaths and Serious Injuries Down a Quarter Near Speed Cameras*, June 7, 2013 www.racfoundation.org.

[10] World Report on Road Traffic Injury Prevention, op cit. p. 20.

[11] ITS international. 2014. *EU Tackles Four Driving Offences which Kill Most*, Safety and Security for Road Infrastructure, www.itsinternational.com.

Appendix B. List of Projects with Road Safety Content during Study Period

No.	Project ID	Project Name	Region	Project Status	Fiscal Year Approval
1	P050623	GH-Road Sec Dev Project (FY02)	AFR	Closed	2002
2	P001785	MZ-Roads & Bridges MMP (FY02)	AFR	Closed	2002
3	P065436	UG-Road Dev Phase 2 APL (FY02)	AFR	Closed	2002
4	P074030	BF-Transp Sec SIM (FY03)	AFR	Closed	2003
5	P074490	CM-Douala Infrastructure (FY03)	AFR	Closed	2003
6	P074963	NG-Lagos Urban Transport Project	AFR	Closed	2003
7	P079351	ML-Transp Corridors Improv (FY04)-(PACT)	AFR	Closed	2004
8	P082615	Northern Corridor Transport Improvement Project	AFR	Active	2004
9	P082806	TRANSPORT INFRASTRUCTURE INVESTMENT PROJECT	AFR	Closed	2004
10	P071985	ZM-Road Rehabilitation and Maintenance Project	AFR	Active	2004
11	P092509	GH-GEF Urban Transport Project	AFR	Active	2007
12	P075566	LS-Integr Transp SIL (FY07)	AFR	Active	2007
13	P083325	MZ-Roads and Bridges Management and Maintenance Program - Phase II	AFR	Active	2007
14	P090075	Second Transport Sector Project	AFR	Active	2007
15	P079749	3A-W Africa Transp. & Transit Facilitat	AFR	Active	2008
16	P101434	NE-Transport Sector Program Support Project	AFR	Active	2008
17	P090135	NG-Federal Roads Development	AFR	Active	2008
18	P079414	RW-Transport Sector Development	AFR	Active	2008
19	P106872	ET-RSDP Stage IV APL (FY09)	AFR	Active	2009
20	P102000	GH-Transport Project SIL (FY09)	AFR	Active	2009
21	P089672	MR-Transport Sector Inst'l Dev. TA	AFR	Closed	2009
22	P096407	3A-Abidjan-Lagos Trade and Transport Facilitation Project (ALTTFP)	AFR	Active	2010
23	P091828	MU-Infrastructure Project	AFR	Active	2010
24	P114762	NG-Lagos Urban Transport Project 2	AFR	Active	2010
25	P055120	TZ-Transport Sector Support Project	AFR	Active	2010
26	P092837	UG:Transport Sector Development Project	AFR	Active	2010
27	P106596	ZM-RRMP PHASE II APL	AFR	Active	2010
28	P125915	3A: CEMAC Transport and Transit Facil	AFR	Active	2011
29	P124109	KE:Transport Sector Support Project	AFR	Active	2011
30	P114880	MZ:APL2 Roads & Bridges Additional Finan	AFR	Active	2011
31	P126516	Cape Verde - Transport Sector Reform	AFR	Active	2013
32	P130422	CEMAC Transp and Transit Facil-3rd Addtl	AFR	Active	2013
33	P117731	Ethiopia-Transport Sector Project	AFR	Active	2013
34	P126321	KE-National Urban Transport Improvement	AFR	Active	2013
35	P131107	NE - Transp Sect Prog Spt Proj Addit Fin	AFR	Active	2013
36	P120370	Southern Africa Trade and Transport Facilitation Project	AFR	Active	2013
37	P070459	CN-Inner Mongolia Hwy Project	EAP	Closed	2002

No.	Project ID	Project Name	Region	Project Status	Fiscal Year Approval
38	P076714	CN-2nd Anhui Hwy	EAP	Closed	2003
39	P058847	CN-3rd Xinjiang Hwy Project	EAP	Closed	2003
40	P070441	CN-Hubei Xiaogan Xiangfan Hwy	EAP	Closed	2003
41	P069852	China Wuhan Urban Transport Project	EAP	Closed	2004
42	P081749	CN-Hubei Shiman Highway	EAP	Closed	2004
43	P083543	LA-ROAD MAINT APL2	EAP	Closed	2004
44	P075173	TH-HIGHWAYS MGMT	EAP	Closed	2004
45	P075523	WS-Second Infrastructure Asset Management Project	EAP	Closed	2004
46	P085080	VN-ROAD SAFETY PROJECT	EAP	Closed	2005
47	P093906	CN-3rd Jiangxi Hwy	EAP	Closed	2006
48	P099992	CN-Liaoning Medium Cities Infrastructure	EAP	Closed	2006
49	P075613	CN-Shaanxi Ankang Road Development	EAP	Closed	2007
50	P079906	ID-Strategic Roads Infrastructure	EAP	Active	2007
51	P107627	TH Community Youth Helmet Use	EAP	Closed	2007
52	P083588	VN-MKG DELTA TRANSPORT INFRA DEV	EAP	Active	2007
53	P099112	CN-Anhui Highway Rehabilitation and Improvement Project	EAP	Closed	2008
54	P090335	CN-China-GEF-World Bank Urban Transport Partnership Program Project	EAP	Active	2008
55	P092631	CN-Xi'an Sustainable Urban Transport	EAP	Active	2008
56	P106603	KH - Road Asset Mgmt (ADB/AusAID)	EAP	Active	2008
57	P079935	PH- Natl Rds Improv. & Mgt Ph.2	EAP	Active	2008
58	P083581	VN-HANOI URBAN TRANSPORT	EAP	Active	2008
59	P101258	CN-Hubei Yiba Highway	EAP	Active	2009
60	P112838	China Wuhan Second Urban Transport	EAP	Active	2010
61	P111421	CN-Anhui Medium Cities Urban Transport Project	EAP	Active	2010
62	P119491	CN-Facil Legis Reform Children Rd Safety	EAP	Closed	2010
63	P096920	CN-Ningxia Highway	EAP	Active	2010
64	P081615	CN-Taiyuan Urban Transport Project	EAP	Active	2010
65	P114133	iRAP Vietnam Staff Costs	EAP	Closed	2010
66	P102398	LA-Road Sector Project	EAP	Active	2010
67	P110632	CN - Sichuan Small Towns Development	EAP	Active	2011
68	P122151	Kiribati Road Rehabilitation Project	EAP	Active	2011
69	P106235	VN-EXPRESSWAY DEVEL DaNang-QNgai	EAP	Active	2011
70	P090990	Western Indonesia National Roads Improv.	EAP	Active	2011
71	P124978	CN-Changzhi Urban Transport	EAP	Active	2012
72	P123133	CN-Gansu Qingyang Urban Infrastructure	EAP	Active	2012
73	P119071	CN-Hubei Xiangyang Urban Transport	EAP	Active	2012
74	P116398	Medium Cities Development Project	EAP	Active	2012
75	P126454	Xinjiang Yining Urban Transport Improve	EAP	Active	2012
76	P129347	Lao Road Sector Additional Financing	EAP	Active	2013
77	P126611	Liaoning Coastal Economic Zone Urban Infrastructure and Environmental Management Project	EAP	Active	2013
78	P123384	VN-Danang Sustainable City Development	EAP	Active	2013
79	P066260	ROAD MAINT	ECA	Closed	2002

APPENDIX B
LIST OF PROJECTS WITH ROAD SAFETY CONTENT

No.	Project ID	Project Name	Region	Project Status	Fiscal Year Approval
80	P071347	ROAD MGMT SAFETY	ECA	Closed	2002
81	P078170	ROAD MAINT & REHAB	ECA	Closed	2004
82	P086277	Secondary & Local Roads Project	ECA	Closed	2004
83	P075207	TRNSPT REHAB (SERBIA)	ECA	Closed	2004
84	P088824	ROAD MAINT & REHAB 2	ECA	Closed	2005
85	P083620	TRANSPORT RESTRUCTURING	ECA	Closed	2005
86	P096214	ROAD MAINTENANCE & REHAB 3	ECA	Closed	2006
87	P083110	HIGHWAY IMPR 1	ECA	Closed	2007
88	P091723	MK Second Trade and Transport Facilitation Project	ECA	Closed	2007
89	P099894	ROAD INFRASTRUCT REHAB	ECA	Closed	2007
90	P078949	TRANSPORT	ECA	Closed	2007
91	P100667	HIGHWAY 2 - ADDITIONAL FINANCING	ECA	Active	2008
92	P094044	HIGHWAY IMPROVEMENT 2	ECA	Closed	2008
93	P100792	ROAD INFRA & SAFETY	ECA	Closed	2008
94	P107610	HIGHWAY IMPROVEMENT 2 ADDL. FINANCING	ECA	Closed	2009
95	P100580	ROADS & SAFETY IMPROVEMENT	ECA	Active	2009
96	P099270	SOUTH WEST ROADS	ECA	Active	2009
97	P118023	AZ-Third Highway Project	ECA	Active	2010
98	P108005	CORRIDOR X HIGHWAY PROJECT	ECA	Active	2010
99	P112523	EW HIGHWAY IMP 3	ECA	Active	2010
100	P117152	KAKHETI REGIONAL ROADS	ECA	Active	2010
101	P107608	National Road Rehabilitation (Osh-Batken-Isfana)	ECA	Active	2010
102	P123291	AF-NATL. ROAD REHAB (Osh-Batken-Isfana)	ECA	Active	2011
103	P118375	Road Upgrading and Modernization Project	ECA	Active	2011
104	P128863	AF-EAST WEST HWY IMPRVMT 3	ECA	Active	2012
105	P128050	EAST-WEST ROADS	ECA	Active	2012
106	P122204	SLRP II	ECA	Active	2012
107	P130413	Fourth East West Highway Improvement Project	ECA	Active	2013
108	P126782	LIFELINE ROAD NETWORK IMPROVEMENT PROJ	ECA	Active	2013
109	P127876	ROAD REHABILITATION AND SAFETY PROJECT	ECA	Active	2013
110	P127156	SECOND ROAD & SAFETY IMPROVEMENT PROJ.	ECA	Active	2013
111	P068968	BO Road Rehabilitation and Maintenance Project	LCR	Closed	2002
112	P074726	CO Bogota Urban Services Project	LCR	Active	2003
113	P088153	AR National Highway Asset Management	LCR	Closed	2004
114	P073985	CL GEF Sus Trans & Air Quality Santiago	LCR	Closed	2004
115	P082466	CO Integrated Mass Transit Systems	LCR	Closed	2004
116	P035740	PE- Lima Urban Transport Project	LCR	Closed	2004
117	P057481	UY-Transport Infrastructure Maintenance and Rural Access	LCR	Closed	2005
118	P086689	CL-Santiago Urban Transport TAL	LCR	Closed	2006
119	P105288	AR APL2 Buenos Aires Infrastructure	LCR	Closed	2007
120	P095569	AR APL2 National Highway Asset Mgt	LCR	Closed	2007
121	P099051	AR- SANTA FE ROAD Infrastructure	LCR	Closed	2007

No.	Project ID	Project Name	Region	Project Status	Fiscal Year Approval
122	P099585	AR-Cordoba-Road Infrastructure	LCR	Closed	2007
123	P007077	EC-RURAL ROADS	LCR	Closed	2007
124	P082026	PY Road Maintenance	LCR	Active	2007
125	P109058	HN Road Rehabilitation & Improvement II	LCR	Active	2008
126	P113084	CO Disaster Risk Mgmt CAT DDO	LCR	Closed	2009
127	P116989	AR-Road Safety	LCR	Active	2010
128	P118410	BR Mato Grosso do Sul Road	LCR	Active	2010
129	P106663	BR Sao Paulo Feeder Roads Project	LCR	Active	2010
130	P116929	Peru Safe and Sustainable Transport Project	LCR	Closed	2010
131	P121477	UY Road Safety EDU-CAR Campaign	LCR	Closed	2010
132	P120198	AR Norte Grande Road Infrastructure	LCR	Active	2011
133	P122007	BO Nat'l Roads & Airport Infrastructure	LCR	Active	2011
134	P117947	CO Support Nat'l Urban Transit Program	LCR	Active	2012
135	P123447	NI-Rural Roads Infrastructure Improvement Project	LCR	Active	2012
136	P121495	BR MST Tocantins Integrated Sust. Reg.	LCR	Active	2013
137	P130972	CO Productive & Sust. Cities DPL	LCR	Closed	2013
138	P127723	Sao Paulo Sustainable Transport Project	LCR	Active	2013
139	P125803	UY Road Rehabilitation and Maintenance Project	LCR	Active	2013
140	P082754	MA-Rural Roads	MNA	Closed	2004
141	P125135	RY-Road Asset Management Project	MNA	Active	2013
142	P112296	GRSF: Burden of Injuries in SSA	OTH	Closed	2010
143	P114763	IRF Road Safety Training	OTH	Closed	2010
144	P126051	iRAP (Bloomberg RS10)	OTH	Active	2011
145	P072539	IN: Kerala State Transport Project	SAR	Closed	2002
146	P069889	IN: MIZORAM ROADS	SAR	Closed	2002
147	P050668	IN: MUMBAI URBAN TRANSPORT PROJECT	SAR	Closed	2002
148	P067606	IN: UP Roads	SAR	Closed	2003
149	P050649	Tamil Nadu Road Sector Project	SAR	Closed	2003
150	P010556	PK: HIGHWAYS REHAB	SAR	Closed	2004
151	P083780	IN: TN Urban III	SAR	Closed	2006
152	P096019	IN: HP State Roads Project	SAR	Active	2007
153	P090585	IN: Punjab State Road Sector Project	SAR	Active	2007
154	P095977	NP: Road Sector Development Project	SAR	Active	2008
155	P096023	IN: Orissa State Roads	SAR	Active	2009
156	P096021	IN: Andhra Pradesh Road Sector Project	SAR	Active	2010
157	P107847	LK: Provincial Roads Project	SAR	Active	2010
158	P122371	IN: Mizoram Roads AF II-AF	SAR	Closed	2011
159	P121515	IN: NHAI Technical Assistance Project	SAR	Active	2011
160	P107649	IN:Karnataka State Highway Improv Pro II	SAR	Active	2011
161	P119735	NP: Road Sector Development Project-AF	SAR	Active	2011
162	P123311	PK: Highways Rehabilitation Project-AF	SAR	Closed	2011
163	P096018	IN: Assam State Roads Project	SAR	Active	2012

APPENDIX B
LIST OF PROJECTS WITH ROAD SAFETY CONTENT

No.	Project ID	Project Name	Region	Project Status	Fiscal Year Approval
164	P123828	BD: Second Rural Transport Project	SAR	Active	2013
165	P130339	IN: India Second Kerala State Transport Project	SAR	Active	2013
166	P144335	Nepal-India Reg Trade & Transport Prj	SAR	Active	2013

Appendix C. List of Project Performance Assessment Reports Relevant to This Study

Report No.	Country	Document Date	Project Name/ID
31520	Turkey	2/7/2005	Turkey—Road Improvement and Traffic Safety Project
32430	Russian Federation	5/24/2005	Russia Federation—Urban Transport and Bridge Rehabilitation Projects
36589	Brazil	6/27/2006	Brazil—Recife Metropolitan Transport Decentralization Project and Belo Horizonte Metropolitan Transport Project
39323	Bangladesh	4/4/2007	Bangladesh—Dhaka Urban Transport Project
42868	Ethiopia	3/10/2008	Ethiopia—Road Sector Development Program
47414	Romania	3/3/2009	Romania—Second Roads Project
48966	China	6/17/2009	China—-Tri-Provincial Highway Project, and Hubei Xiaogan- Xiangfan Highway Project
62433	Uganda; Tanzania	6/21/2011	Tanzania—Second Integrated Roads and Central Transport Corridor; and Uganda—First and Second Phase Road Development and Roads Sector Institutional Support Technical Assistance Projects
69813	Mozambique	6/25/2012	Mozambique—First Phase of the Roads and Bridges Management and Maintenance Program Project, and Railways and Ports Restructuring Project
70678	India	6/28/2012	India—Gujarat State Highway Project, and Karnataka State Highways Improvement Project
83251	Poland	12/18/2013	Poland—First, Second, and Third Road Maintenance and Rehabilitation Project

Appendix D. List of Sample of Non-Lending Activities

No.	Project ID	Project Name	Product Line	Project Status	Fiscal Year Approval
1	P147916	Gender Informed Road Safety Strategies in ECA: Reducing Accidents through a Gender Targeted Approach		Active	2016
2	P121046	China Road Safety Roadmap Development	ESW	Active	2011
3	P132607	North South Corridor RSMCR and Audit	ESW	Active	2014
4	P078323	VN-Transport Safety Strategy Review	ESW	Closed	2003
5	P079909	CN-Road Traffic Safety	ESW	Closed	2003
6	P077814	LKD 3A ROAD SAFETY AUDIT	ESW	Closed	2004
7	P088145	CN-National Road Safety	ESW	Closed	2004
8	P110301	CN - Road Traffic Safety	ESW	Closed	2009
9	P133300	Road Safety Management Capacity Review	ESW	Closed	2014
10	P144798	EC Strengthening Capacity for Monitoring and Evaluation of Safety Program	IDF	Pipeline	2014
11	NA	Bulgaria: Road Safety Action Plan	Reimbursable TA	Closed	2012
12	NA	Romania: Strategic Planning in Trans.	Reimbursable TA	Closed	2012
13	P109439	Safety Management Capacity Review	TA	Active	2010
14	P106426	3A-RS Road Safety Policy Dev. (FY12)	TA	Active	2014
15	P126076	Road Safety Capacity Review (Bloomberg)	TA	Active	2014
16	P126849	3A: SSATP - TFF Corridor Facilitation	TA	Active	2014
17	P127981	EC Transport NLTA	TA	Active	2014
18	P130541	TFF to Support the implementation of the TOTAL and WORLD-BANK Africa Road Safety Corridor Initiative (ARSCI)	TA	Active	2014
19	P146529	Poland - Road Sarety TA	TA	Active	2015
20	P146697/ P146802/ P146803/ P146821/ P145943	Romania: Climate Change and Low Carbon Green Growth Program reimbursable Advisory Service (RAS)	TA	Active	2015
21	P091770	SAFE ROAD DESIGN - PILOT TA	TA	Closed	2006
22	P096733	ECA ROAD SAFETY MGT & CAPACITY REVIEWS	TA	Closed	2006
23	P099153	CN-Traffic Safety	TA	Closed	2007
24	P103903	ROAD SAFETY CAPACITY REVIEW (TUDTR)	TA	Closed	2007
25	P105154	Road Safety Mgt Cap Review (ETWTR)	TA	Closed	2008
26	P103912	Road Safety Guidelines	TA	Closed	2009
27	P112274	Road Safety Management Capacity Review	TA	Closed	2009
28	NA	Poland: Transport Policy Note	TA	Closed	2010

APPENDIX D
LIST OF SAMPLE OF NON-LENDING ACTIVITIES

No.	Project ID	Project Name	Product Line	Project Status	Fiscal Year Approval
29	NA	Russia's Safety Challenge	TA	Closed	2010
30	NA	ECA: Making Roads Safe	TA	Closed	2010
31	NA	SSA: Challenge of Road Traffic Inj.	TA	Closed	2012
32	NA	ECA: Confronting Death on Wheels	TA	Closed	2012
33	P127916	Poland: Road Safety Report	TA	Closed	2012
34	NA	Georgia: Management Cap. Review	TA	Closed	2013
35	NA	Georgia: Road Safety Workshop	TA	Closed	2013
36	P120169	6L-Improving road safety outcomes in LAC	TA	Closed	2014
37	P127916	Road Safety Support	TA	Closed	2014

Appendix E. Case Studies from Developing Countries

Appendix E discusses the case studies from developing countries. Tables E.1–6 present statistics on road traffic death rates for developing countries with a population exceeding 5 million.

Africa Region

In absolute numbers, the road-related mortality rate per capita in Africa is the highest in the world at 28.3 deaths per 100,000 people.[1] For Sub-Saharan Africa the rate is 32.2, which is double the rate for Latin America and South East Asia and five times worse than the best performing nations in Europe. This is although Africa has less than 4 percent of the world vehicle fleet. Four countries, Nigeria, Ethiopia, South Africa, and Sudan, account for half of the road injury death toll in Sub-Saharan Africa.[2] Moreover, this death rate has grown by 84 percent since 1990, almost twice the rate of global increase; pedestrians comprise 44 percent of road deaths, substantially more than the global average of 35 percent.

Box E.1. A Personal Tragedy Mirrored in Too Many African Families

On the eve of the 2010 World Football Cup, former South African President Nelson Mandela experienced a tragedy that is all too common in Africa - his great-granddaughter was killed in a car crash returning home after a concert in Soweto. The driver was arrested and charged with drunk driving. Thousands of African families have experienced the pain of the Mandela family: according to WHO data, close to 250,000 people die each year on African roads, representing one-fifth of the world's road deaths, while about 500,000 sustain non-fatal injuries. Severe underreporting, though, hides the real magnitude of the problem. For example, in Mozambique, 2011 estimates by a Harvard University team indicated that road deaths and non-fatal injuries were twice as high as those reported in official statistics.

Among the reasons for this grim picture is the poverty prevalent over much of the continent such that 18 of the 27 nations with a population exceeding 5 million are classified as low-income countries with a per capita income of under $1,005 a year (see Table E.1). A few of these states are also fragile in the sense that they have experienced civil conflicts, disasters, or wars that have seriously weakened their institutional capacity. In addition access to medical care for injury victims is often poor and facilities inadequate.

According to Marquez, the reality in Sub-Saharan Africa is the need to painstakingly build institutions and capacity to plan manage and implement road safety initiatives

on a national scale.[3] Although the majority of African countries (88 percent) surveyed by the World Health Organization (WHO) reported having a road safety agency, in only 24 percent has the government endorsed a strategy with targets and earmarked funding. Most countries lack comprehensive road safety laws to address the main risk factors, but also suffer from sporadic enforcement, where bribery is a factor. Quality data to assess the problem properly are often unavailable, and emergency medical services are frequently a peripheral element of road safety programs.

Table E.1. Road Traffic Death Rates for 27 Countries in the Africa Region with a Population Exceeding 5 Million

Countries (population exceeding 5 million)	Population (millions, 2010)	Road Traffic Death Rate per 100,000 Population (2010)	Registered Motor Vehicles (millions, 2010)[a]
Nigeria	158.4	33.7 (1)	12.6 (1)
Ethiopia	83.0	17.6	0.4
Congo, Dem. Rep.	66.0	20.9	0.4
South Africa	50.1	31.9 (2)	9.6 (2)
Tanzania	44.8	22.7	1.0 (4)
Sudan[b]	43,6	25.1	0.1
Kenya	40.5	20.9	1.4 (3)
Uganda	33.4	28.9 (3)	0.6
Ghana	24.3	22.2	0.8
Mozambique	23.4	18.5	0.4
Madagascar	20.7	18.4	0.2
Côte d'Ivoire	19.7	20.9	0.5
Cameroon	19.6	20.1	0.4
Angola	19.1	23.1	0.2
Burkina Faso	16.5	27.7 (5)	0.9 (5)
Niger	15.5	23.7	0.2
Mali	15,4	23.1	0.2
Malawi	14.9	19.5	0.2
Zambia	13.1	23.8	0.3
Zimbabwe	12.6	14.6	0.9 (5)
Senegal	12.4	19.5	0.3
Chad	11.2	29.7 (4)	0.2
Rwanda	10.6	19.9	0.1
Guinea	10.0	19.6	0.1
Benin	8.5	23.9	0.1
Burundi	8.3	21.3	0.1
Togo	6.0	17.2	0.1
Sierra Leone	5.9	22.6	0.1

Sources: Primarily WHO Global Safety Status Report and World Bank data.
a. Excludes two-wheelers.
b. Before establishment of South Sudan.

The World Bank operates extensively in the Africa Region, supported by the Sub-Saharan Africa Transport Policy Program (SSATP), which is an international partnership to facilitate policy development and related capacity building in the transport sector in Africa. The platform for the implementation of the Decade of Action for Road Safety is the Africa Road Safety Policy Framework, which underpins the African Action Plan.[4] SSATP subsequently commissioned an initiative to support developing country specific road safety strategies in line with the plan, to identify key mitigation measures, and assist in their implementation. Three locations were proposed for the initial phase to leverage projects funded by development partners, namely Ethiopia, Zambia, and the West African Abidjan-Lagos Corridor. Currently the Bank has 24 active projects with a commitment value of $3.683 billion and safety content valued at $83 million spread across 16 countries. By type of intervention, 38 percent are related to institutional capacity strengthening, 30 percent to infrastructure safety engineering, 14 percent to road user behavior, 13 percent to vehicle safety, and 5 percent to post crash care.

MALI

Mali is a landlocked low-income country in West Africa with a population of 15 million and a road injury fatality rate of 23.1 per 100,000 people. The Bank is financing a project called the Second Mali Transport Sector Project, approved in 2007 and now substantially advanced in implementation, even though it was delayed by a year due to armed conflict in the country. The closing date is the end of 2014. The main safety objective was to improve safety in downtown Bamako (the capital city), which involved segregating bus and minibus traffic in dedicated lanes, rebuilding pedestrian walkways, constructing two pedestrian overpasses and developing traffic management capacity (including safety aspects). In rural areas, road designs were improved to reduce variations in width and to ensure appropriate signage where the width does change (typically where the road narrows because of a bridge or other structure). Spot improvements were also made at a relatively low cost. The creation of a National Road Safety Agency has been a recent development. In addition, two intercity roads allowing higher speeds (60 kilometers per hour) have also been improved by spot improvements. The main challenges on these roads have been the long straight stretches that encourage unsafe speeds and in the dry season dust hazards that increase the risk of collisions.

In the City of Bamako a major problem is the encroachment of local informal traders on the four-lane highway where the buses and taxis pick up and set down passengers. After the coup, civic order broke down and the encroachment became severe until regular police patrols were restored. Even so, this roadside friction means that generally only two lanes are usable instead of four and there is a distinct

road safety hazard. Under the project, 585 little shops were created to house the traders, but these are often just used as storage as the customers are all accessing public transport on the highway. This is an unresolved problem at this point because enforcement is not practical with the resources available and an interesting lesson for future projects. Typical implementation issues encountered and eventually resolved have been cost overruns, lack of sufficient counterpart funding, and a shaky monitoring system. However, the municipal authorities and the government of Mali have still not (at the time this was written) finalized the reorganization of traffic management and traffic patterns required for the effective use by public transport of the new urban infrastructure.

Accident statistics are very unreliable and many incidents are unreported. The police have limited capacity and training, while corruption is also commonplace. More needs to be done to improve enforcement for safe zones for pedestrians. Annual vehicle inspections would also be helpful, but at present this is not feasible. Nevertheless the two overpasses (pedestrian bridges) are working effectively and are being used. The number of pedestrian accidents on project roads fell from a baseline of 81 to 16 at the end of 2011, against a target of 30. Two-wheeled traffic does not appear to pose as severe a problem as in some other West African countries. In a country with such low capacity only the initial steps in a safe systems approach are possible in the short to medium term. In these circumstances it makes sense to ensure that there is a focus the safe engineering design aspects. This would enable all sub-standard structures to be properly addressed to ensure a consistent road width, more crash barriers to be installed and for items such as thermoplastic paint to be utilized to provide clear and lasting road markings, as well as grooving to separate the shoulders from the lanes. However, this could add as much as 10 percent to the costs of the infrastructure and this means 10 percent less road length with limited IDA funds. The politicians in Mali have tended in the past to opt for quantity, but this attitude could be turned around as a better understanding of the importance of road safety gains momentum.

NIGERIA

The Federal Republic of Nigeria is the most populous country in Africa with 169 million people and recently became the largest economy on the continent, overtaking South Africa. It has a road network of 198,000 kilometers of road of which about 60,000 kilometers are paved. In 2008 the Bank approved the $330 million Nigeria Federal Roads Project, which contained a small $2.5 million road safety component. The project development objective referred to reducing traffic related fatalities on targeted federal roads. However, the project faced implementation problems in both the civil works and institutional development

components. In February 2011 the project was restructured at the request of the Nigerian Government, and the road safety component was significantly expanded to $20 million, with two key beneficiary organizations: the Federal Road Safety Corps (FRSC), and the Federal Capital Territory (FCT). The project has two sub-components: first, support to the FRSC at a cost of $10 million to pilot the "safe corridor" approach on the project roads; the safe corridor approach finances training, capacity development, vehicles, and other equipment. Second, support to FCT for physical safety improvements in the FCT at a cost of $10 million to provide pedestrian over-bridges at six locations, investments in traffic management, (including street markings, intersection improvements, and street lighting), with the objective of improving both road safety and traffic flow.

The Global Road Safety Facility (GRSF) conducted a Review of Safety Management Capacity in Nigeria in 2010.[5] The report concluded that the country's greatest asset in addressing road safety issues was the Federal Road Safety Commission along with its delivery entity the FRSC, but that existing capacity in Nigeria was classified as "basic" pending the fruition of many initiatives to improve road safety. The FRSC is a strong and somewhat unique agency with a budget that exceeded $180 million in 2013. It has about 20,000 officers. Its mandate is road safety, vehicle registration, and the issuing of drivers' licenses. FRSC has its own road safety command centers, equipped with intervention vehicles and ambulances. The Project has enabled FRSC to introduce the Safe Corridor Concept, along several roads rehabilitated under the project, where enforcement and emergency response equipment with trained FRSC personnel are deployed. A monitoring and evaluation system shows that fatalities on those corridors have decreased. One serious issue being addressed under the project is crash data and fatalities reporting. According to the WHO, Nigeria's national road safety record is not improving. The national fatality data reported by FRSC is questionable as it relates to recorded deaths at crash scenes only, which may seriously underestimate fatalities. In the circumstances it is difficult to establish baseline data. For the Bank project the baseline data had to be independently collected and verified. A safety expert has also been appointed to evaluate the situation. The dilemma for the Bank is to ensure that the project's limited resources are deployed as effectively as possible, hence the focus of the project on piloting the safe corridor approach supplying equipment and providing large scale training of FRCS management and officers, as well as enhancing data collection and analysis. As for important elements of road safety such as road safety audits, they are rudimentary in Nigeria– there are also at present no national guidelines or training available. FRSC had conducted road safety audits on the project roads and developed multi-sector interventions to improve road safety. The Project would support institutionalizing modern road safety audits in Nigeria.

The most comprehensive training program covers leadership and management for managers as well as basic road safety skills for FRSC officers. Emergency response teams were trained in Abuja's trauma center. Enforcement training benefited FRSC's enforcement officers. A peculiarly Nigerian problem is the control and administration of its vast road tanker fleet for petroleum products. A train-the-trainers approach was thus adopted for tanker drivers.

By and large, progress with implementation of the road safety component dedicated to FRSC has been satisfactory. However, the road safety subcomponent that benefited the FCT had only limited impact. The locations of a few pedestrian bridges could have better chosen, as pedestrian traffic estimations relied on old data. The structures themselves were over-designed, as the local engineering designers were unfamiliar with typical designs for such structures. Adjustments had to be introduced to remedy inadequate pedestrian approaches and facilities for disabled access. The effectiveness of other interventions in the FCT such as the road horizontal marking was limited, as compliance with the lane markings is low in Nigeria.

RWANDA

Rwanda is a landlocked, low-income Central African country situated a few degrees south of the equator. It has a young and predominantly rural population just short of 11 million, and a road injury fatality rate of 19.9 per 100,000 people. Ten years ago Rwanda had one of the worst road-safety records in the world, but there has been improvement as road fatalities fell by around 30 percent.[6] This followed road safety legislation upgrading and improved enforcement of regulations, while WHO funded some road safety campaigns. Coach drivers ferrying passengers to Kigali from Kenya and Uganda objected to Rwanda's introduction of national speed limits of 60 kilometers per hour, which were 20 kilometers per hour lower than in the neighboring east African countries of Kenya and Uganda. Notwithstanding, Rwandan citizens have a low awareness of road safety issues and attach a higher priority to physical road improvements. The safety statistics are now typical for the region instead of much worse. Curiously enough the use of helmets by two wheeled motorcyclists (including passengers) is relatively good.

The current Bank involvement is with the Transport Sector Development Project. The project was scheduled to be completed by December 31, 2013, but has been extended by a year, mainly to undertake the road safety aspects - the procurement is only now under way for this component indicating that preference was given to the infrastructure aspects of the project. There were no indicators to measure progress in road safety other than simple outputs. Road safety did not feature in the various

Country Assistance Strategies and transport itself has a lower priority than energy or urban development.

The original project was approved in 2007. There were no other financiers for the transport sector at the time and the Bank tried to cover all aspects of the transport sector in one project. Although Rwanda is small, the capacity of the government remains fairly weak and fragmented. There is little coordination between government departments and agencies, and no urban transport strategy. Vehicle inspections are ineffective and the police still tend to see enforcement primarily as a source of income. This is although the government instigated a crackdown on police corruption in 2004, in which more than 100 officers were sacked for taking bribes. Road safety statistics are generally inadequate so the road safety component of this project was to develop a road safety action plan cum strategy, improve data collection, and establish a more reliable database. However, there is little commitment to work with other departments (such as the police) and thinking generally remains in a silo mode. The Ministry of Infrastructure and the Road Agency look at road safety mainly in the context of black spot elimination and road design. This is unlikely to change until a coordinating road safety nucleus can be established. No follow-on project is planned at this stage.

TANZANIA

Tanzania is a low-income country in East Africa with a population of 45 million people. In 2010 the road accident fatality rate was 22.7 per 100,000 people—not the worst, but still very serious. However, of great concern, the trend of reported accidents has been worsening at an annual rate of 6 percent since 2000. In 2009 Parliament approved a National Road Safety Policy to provide direction for addressing in a comprehensive manner multi-facetted road safety issues including the establishment of a National Road Safety Agency, a Driver and Vehicle Examination and Licensing Agency (DVELA), a road accident information system, and training in road safety education and traffic police. Support was to be provided through the Bank funded Transport Sector Support Project for $6 million (as a component of a multi sub-sector $214 million transport improvement project). Progress on the safety component has been slower than expected, with the physical engineering aspects demanding more attention. A consultant has been appointed for the accident information system, but NSRA and DVELA are delayed awaiting the approval of a Road Safety Act. It is possible that support for the new institutions will not be possible before the project closes.[7] However, as the financing instrument is an adaptable program loan (APL) it may be possible to pick up this issue in a follow on project.

In earlier highway projects the Bank has focused on speed reducing measures to make travel through villages safer. These measures include appropriate signing and signaling; speed humps proceeded by rumble strips; elevated pedestrian crossings; and widening of roads through villages with provision for a sidewalk.

An unusual project approved in 2013 and now effective, also using the APL financing instrument, is the Southern Africa Trade and Transport Facilitation Project. It comprises the upgrading of part of a transport corridor (the Dar Corridor connecting Tanzania, Malawi, Zambia, and the Democratic Republic of Congo) and includes measures to expedite trans- frontier traffic. The project focuses on the rehabilitation and upgrading of 138 kilometers of the Dar es Salaam corridor in Tanzania and includes the improvement of the border crossing facilities and the construction of three one-stop inspection stations. Significantly for this report, there is an $11 million road safety component comprising a road safety audit to identify accident "black spots," and the preliminary design of specific interventions to address them. In addition, there is the undertaking of a management capacity review for the corridor and the identification of a 'safe corridor' management initiative.

This is a pioneering project for other transport corridors elsewhere in Sub-Saharan Africa. The SSATP has supported the concept through the preparation of a document outlining institutional arrangements for transport corridor management[8] and more specifically for safety guidelines for mainstreaming road safety in such corridors.[9]

An HIV/AIDS component involves upgrading clinics in the corridor. Though focused on HIV, the upgrade could improve response time to accidents. Road safety indicators identified are reduction in the number of accident black spots, length of lane kilometer subject to road safety audit, number of improved health centers, and number of medical personnel trained in these centers. Slower speeds are also expected in built up areas. The project is in its early stages, but from a safety point of view, it could be a reasonable alternative while a holistic approach at the national level in Tanzania is not yet practical. Most road safety projects like this one have a high rate of return. GRSF has been supportive (grant funding for trauma care).

East Asia and Pacific Region

Road traffic crashes accounted for 334,815 deaths in the South-East Asia Region during 2010, with a rate of 18.5 per 100 000 population. Vulnerable road users (i.e., motorized two or three-wheelers, pedestrians and cyclists) are victims in nearly 50

percent of the deaths in the Region. Two-thirds of the road traffic in the countries of South-East Asia are made up of two- or three-wheelers, and one-third of the deaths is among these road users. None of the countries has comprehensive legislation on all five key risk factors of road traffic injury—speeding, drunk driving, and use of motorcycle helmets, seat belts, and child restraints. Only three countries have policies to promote walking, cycling, and public transport, and only five countries have policies to separate vulnerable road users as a way of protecting them. Eight countries in the Region have a lead agency for road safety, most of which are inter-ministerial committees. By type of intervention, 41 percent are related to institutional capacity strengthening, 37 percent to infrastructure safety engineering, 9 percent to road user behavior, 8 percent to post crash care, and 5 percent to vehicle safety. The Bank supports 27 active projects in the Region spread over nine countries (14 of which are in China and five in Vietnam, but only two in the South Pacific). The total commitment value is $4.043 billion and the value of road safety content is $113 million.

Table E.2. Road Traffic Death Rates for 11 Countries in the East Asia and Pacific Region with a Population Exceeding 5 Million

Countries (population exceeding 5 million)	Population (millions, 2010)	Road Traffic Death Rate per 100,000 Population (2010)	Registered Motor Vehicles (millions, 2010)[a]
China	1,348.9	20.5 (4)	207.1 (1)
Indonesia	239.9	17.7	72.7 (2)
Philippines	93.3	9.1	6.6
Vietnam	87.8	24.7 (3)	33.2 (3)
Thailand	69.1	38.1 (1)	28.5 (4)
Myanmar	48.0	16.0	2.3
Malaysia	28.4	25.0 (2)	20.2 (5)
North Korea	24.4	10.7	N/A
Cambodia	14.1	17.2	1.7
Papua New Guinea	6.9	13.0	N/A
Lao PDR	6.2	20.4 (5)	1.0

Sources: Primarily WHO Global Safety Status Report and World Bank data.
a. Excludes two-wheelers.

CHINA

The China Research Institute of Highways, selected 2,500 kilometers that would benefit from an International Road Assessment Program (iRAP) study. The World Bank and the government of China also agreed to review the road safety situation in China and prepare a new road safety engagement strategy. The strategy aims to facilitate an accelerated transfer of road safety knowledge and scaling up of investment at national, provincial and city levels to rapidly improve China's road safety performance, with an emphasis on strengthening national lead agency

functions and multi sector coordination arrangements.[10] China recognizes that road safety audits can drastically improve road safety and reduce the number and seriousness of car accidents at a low cost to benefit ratio.[11] In particular China has been interested in improving school transport safety and consequently the World Bank and the Pupil's Transportation Safety Education Activities Office held a workshop supported by Bloomberg Philanthropies to share best international practice on school-related transport safety.

Other Bank assistance has been through investment projects, including urban transport and rural roads and expressway development. In recent years there has been a shift in the Bank's portfolio toward urban transport and to other transport modes, but the speed of urban growth can pose difficulties in implementation as the pace of city expansion accelerates. For example, the Second Wuhan Urban Transport Project involved the development of several integrated public transport and road safety corridors. One of the first of these corridors was to incorporate international good practice in providing segregated bus lanes, bus priority traffic signaling and better quality bus stops as well as non-motorized transport facilities. This was part of a much larger urban development strategy, but was affected by a sudden change in the city government's priorities that included metro development and new expressways. This took the Bank by surprise and delayed the Bank portion of the scheme because the metro construction directly affected the chosen corridor and the Bank was asked to consider an alternative corridor. This necessitated a revision of the components, indicators, and the project closing date. To go forward, the project will need approval of a second order restructuring. Some other projects have been delayed by a shortage of counterpart finance (not a safety issue), while others appear to have gone smoothly without any serious problems. In progress is economic and sector work to analyze road safety strategic issues in China which is expected to recommend a dialogue with the borrower, and to help define the Bank's future assistance strategy in road safety in that country.

Europe and Central Asia Region

In the Europe and Central Asia Region there are two types of developing countries that have benefitted from Bank financing, namely those that have been seeking accession to the European Union (EU) such as Poland and Romania and those that were part of the former Soviet Union such as Kazakhstan and Tajikistan. Regarding the former, once accepted into the EU, these countries are eligible for EU financing; regarding the latter group, most countries have at least one Bank financed road project with a safety component, although it has apparently not always easy to persuade the borrower to include safety in the project objective. Currently there are

16 active projects in nine countries, excluding those that are high income, with a road safety component and their total commitment value is $5.456 billion and the road safety content valued at $109 million. By type of intervention 43 percent are related to institutional capacity strengthening, 34 percent to infrastructure safety engineering, 7 percent to road user behavior, 7 percent to post crash care, and 3 percent to vehicle safety.

Table E.3. Road Traffic Death Rates for 13 Countries in the Europe and Central Asia Region with a Population Exceeding 5 Million

Countries (population exceeding 5 million)	Population (millions, 2010)	Road Traffic Death Rate per 100,000 Population (2010)	Registered Motor Vehicles (millions, 2010)[a]
Russian Federation	143.0	18.6 (3)	43.3 (1)
Turkey	72.8	12.0	15.1 (2)
Ukraine	45.5	13.5	14.4 (3)
Uzbekistan	27.4	11.3	N/A
Romania	21.5	11.1	5.0 (4)
Kazakhstan	16.0	21.9 (1)	3.3
Serbia	9.9	8.3	2.4
Belarus	9.6	14.4 (5)	3.8 (5)
Azerbaijan	9.2	13.1	1.0
Bulgaria	7.5	10.4	3.2
Tajikistan	6.9	18.1 (4)	0.4
Slovakia	5.4	9.4	2.3
Kyrgyzstan	5.3	19.2 (2)	0.4

Sources: primarily WHO Global Safety Status Report and World Bank data.
a. Excludes two-wheelers.

UKRAINE

The road safety situation in Ukraine is of concern because its citizens are four more times likely to die from road traffic injuries than those in Western Europe, in spite of the much lower motorization rate and the relatively shorter trip distances. Recent official statistics indicate that more than 22,000 people died and about 90,000 people required medical treatment because of road traffic injuries during 2007–2009. The key factors that contribute to the poor road safety records are poor road conditions and the lack of safety features in road design, unsafe driving behavior, and ineffective enforcement of traffic laws and regulations. The World Bank carried out a Road Safety Management Capacity Assessment for Ukraine in 2006. But, despite such recent efforts, the country's road safety management capacity remains inadequate. The Ministry of Interior—the designated lead agency for road safety—does not have the legal mandate, funding, or capacity to deliver the necessary institutional functions for road safety management. Several strategies and action plans have been developed in the past, but often without the necessary high-level

political will and support, measurable targets, clear ownership, or realistic funding; hence they did not lead to successful implementation.

The current World Bank financed active road project, approved in September 2012, is the $540 million Second Roads and Safety Improvement Project.[12] It is intended to contribute to improved road safety on selected road corridors and decrease the number of road accidents in them. The road safety component will finance two types of activities: the safety improvements along several high-risk road corridors and the introduction of improved road safety features on the existing urban road sections that will remain even after bypasses have been built around them. For the former, a comprehensive road safety assessment is being carried out, using the Risk Mapping and Star Rating approach of the iRAP. This assessment will identify between two and four high-risk corridors and recommend specific engineering solutions to be introduced. The component will then finance the actual implementation of the engineering solutions, which will include civil works and various types of road safety equipment. For the latter, this component will finance the re-design of the village sections and the implementation of various measures to reduce traffic speed (such as traffic calming) and improve pedestrian safety. However, supervision missions have had to be postponed due to the unrest followed by potential conflict in Ukraine, but implementation has apparently proceeded thus far without disruption. The potential impact of the political context is going to be assessed on an ongoing basis.

Latin America and the Caribbean Region

According to the WHO Global Status Report on Road Safety, there were 19.2 road fatalities per 100,000 inhabitants in Latin America in 2010, a rate that is more than three times higher than several European countries.[13] The United Nations (UN) projection for 2020 is 30 deaths per 100,000 inhabitants, largely because of the rise in the number of vehicles. However, the commitment made by countries in the Region when they agreed to the UN resolution for the Decade of Action for Road Safety is to bring the rate down to 15 per 100,000.

The World Bank and regional institutions report, however, that in Bolivia, the Dominican Republic, Ecuador, and Venezuela traffic accidents have increased since 2011. In the latter two, the increase is as high as 40 percent, in large part due to accidents involving motorcycles. Pedestrians, cyclists, and motorcyclists account for 70 percent of the victims of urban road accidents.[14] The ambitious UN goal can only be achieved if road safety efforts are intensified substantially and new measures are introduced. Evidence shows there are some countries that have brought down

extremely high road fatality rate, especially Argentina, Chile, and Uruguay, but in many other countries in the region, traffic accidents continue to rise.

Table E.4. Road Traffic Death Rates for 16 Latin America and Caribbean Countries with a Population Exceeding 5 Million

Countries (population exceeding 5 million)	Population (millions, 2010)	Road Traffic Death Rate per 100,000 Population (2010)	Registered Motor Vehicles (millions, 2010)[a]
Brazil	195.0	22.5 (4)	64.8 (1)
Mexico	113.4	14.7	30.9 (2)
Colombia	46.3	15.6	7.2 (4)
Argentina	40.4	12.6	14.2 (3)
Peru	29.1	15.9	3.2
Venezuela	29.0	37.2 (2)	4.1 (5)
Chile	17.1	12.3	3.4
Ecuador	14.5	27.0 (3)	1.0
Guatemala	14.3	6.7	2.1
Cuba	11.3	7.8	0.6
Bolivia	9.9	19.2	0.9
Dominican Republic	9.9	41.7 (1)	2.7
Honduras	7.6	18.8	1.0
Paraguay	6.5	21.4	0.9
El Salvador	6.2	21.9 (5)	0.7
Nicaragua	5.8	18.8	0.5

Sources: Primarily WHO Global Safety Status Report and World Bank data.
a. Excludes two-wheelers.

ARGENTINA

Argentina's $38.5 million dedicated road safety project was prepared as a collaborative partnership between the transport and health teams in the Argentina World Bank Country Office (Bliss and Raffo 2013). The project has three components:

- Institutional capacity building to provide technical assistance and equipment to assist with the adoption of best international practice;
- The introduction of three demonstration safe corridors ($1.14 million) identified using the International Road Assessment Program
- Road auditing methodology together with an incentive fund program; and
- The establishment of a road safety monitoring and evaluation system.

In 2008, Argentina created *Agencia Nacional de Seguridad Vial* (ANSV), a national road safety agency. The federal government's decision to empower and resource ANSV confirmed its position as "owner" of the nation's road safety and manager of related strategic partnerships. The institutional capacity-building component was two-thirds of the total project cost.

The component included (i) project management; (ii) creation of a national driver license registry system, establishment of a national traffic records and infractions registry; (iii) a five-year strategic plan for ANSV; (iv) communication, awareness, and education campaigns including a plan for national social communications and education campaigns, road safety education kits, grants for eligible nongovernment organizations, and provision of training, workshops, and seminars related to road safety; v. improvement of emergency response capacity including a diagnosis of current capabilities and protocols and subsequent upgrading, design and implementation of improvements in emergency coordination systems among concerned agencies (such as police, ambulance services, hospitals, and insurance companies), training for emergency response personnel, and acquisition of equipment to facilitate the work of road crash emergency personnel; and vi. strengthening of the capacity of traffic control and enforcement agencies through the development of training modules, the acquisition of alcohol meters, speed control radar guns, and other radar technology as well as development of a national plan for speed control.

Activities related to educational curricula for primary and secondary schools are being carried out in consultation and cooperation with the Federal Ministry of Education and relevant authorities in participating provinces and municipalities. Activities for traffic enforcement agencies are being carried out through high-level workshops and twinning arrangements organized by RoadPOL[15] Major efforts are also being made on the emergency response and traffic control fronts, collaborating with other ministries or entities as appropriate. The financial instrument chosen was an adaptable program loan since a follow-up project was envisoned based on defined "triggers" to be accomplished in the first phase; this recognizes that improving road safety outcomes is a long-term process. An important subcomponent was a $10 million incentive program to help participating provinces and municipalities finance innovative road safety initiatives that otherwise would not have been funded because of competition for limited financial resources. To build the results management platform in Argentina's National Road Observatory, the project invested in road safety monitoring systems and tools. The Observatory set up a new data collection system for road crashes, and surveys will provide baseline data for seat belt usage, helmet usage, and distractive factors.

Although the work in the Argentina road safety project corridors is ongoing, early results are encouraging. All intermediate results indicators have been met. The Independent Evaluation Group believes this project is important from a learning point of view because the project builds upon and reinforces Argentina's correct sequential implementation of the World Report recommendations. Implementation has not been problem free, however. Originally, three demonstration corridors were

selected in discussion with the Argentina Roads Agency (DNV). This is a large organization with the largest budget in the government, but in juggling its multiple responsibilities the chosen corridors slipped down DNV's priority list, forcing ANSV and the Bank to choose different corridors. Unfortunately, this was a backward step because the baseline had been established for the original corridors, which caused some difficulties for the team. However, the Argentina project is also founded on some opportune circumstances including continuing political will at the presidential and ministerial level that followed negative publicity about some major tragic crashes.

A Memorandum of Understanding was also concluded recently to establish a new database covering road safety data for the 20 countries participating in the regional Ibero-American Road Safety Observatory. The database will use indicators for monitoring and comparing progress in reducing traffic-related deaths and serious injuries from the region, and the data will be publicly available. This project is expected to facilitate cooperation among participating countries and serve as an important step to progressively improve data collection and analysis in the region. The database forms part of a policy for the development of effective, evidence-based road safety plans.[16] The Bank initiated regional meetings to share experiences. Capacity assessments have begun with funds from grants made by GRSF and the World Bank Institutional Development Fund (in cases where this is not an existing loan on which to piggyback). Brazil was an early beneficiary. About twenty countries are now participating in this south-south cooperation observatory, supported by a grant of $700,000. Shared historical links and language helped cement the relationship.

BRAZIL

Unlike Argentina and Chile, Road safety management in Brazil is fragmented and road accident data are unreliable. For example, according to the World Health Organization 2013 Global Status Report, Brazil's road fatalities in 2009 were estimated to be 43,869 against official figures of 35,594. Meanwhile, a study by the national compulsory insurance provider produced figures of 58,134 in 2011 and 60,752 in 2012, based on insurance claims. There are 27 states in Brazil and many of the poorer states have a dismal road safety record. Three states are even unable to provide accident data at all. Nationally, elderly pedestrians are at particularly high risk and motorcycle fatalities are increasing at a rapid rate. Less prosperous regions have higher proportions of vulnerable road user deaths.[17] Brazil introduced a zero tolerance law in 2008 for drivers found to have traceable amounts of alcohol in their blood, yet drivers involved in traffic accidents sometimes receive softer sentences, such as being made to donate money to charity, as their crimes were not seen as

deliberate.[18] In 2011, The World Health Organization conducted a review of Brazil's Federal road traffic safety regulatory system, in which it assessed the comprehensiveness of existing Federal laws and regulations. Gaps were identified related to drink–driving and speeding, as well as weak enforcement provisions.

The Bank has an active project in mid-implementation through the Economy and Planning Secretariat - the São Paulo Feeder Roads. It concerns the rehabilitation of 1,500 kilometers of paved municipal roads in the City of São Paulo. At appraisal the Bank loan was $130 million, while the borrower contribution was $466 million. Following a restructuring, the Bank contribution was increased to $166 million. Safety improvements of a traditional nature (estimated to be $2.5 million) involve curve realignments and black spot elimination as well as institutional strengthening of the state road investment program. Thus far no significant safety related implementation issues have been reported in the implementation supervision reports (ISRs).

The state faces a grave road safety situation exacerbated by rapidly increasing motorization and more recently rapid growth in motorcycles especially in the urban areas. GRSF, however, has prepared a road safety management capacity review and multi sector strategy for road safety investments for the state.[19] The review concludes that more effective coordination with national and municipal government is critical, and that technical assistance is necessary inter alia to improve leadership, management structures, cooperation and appropriate funding to enable the delivery of a results-focused road safety strategy.

This state is the economic powerhouse of Brazil, containing a disproportionate share of Brazil's industrial and agricultural production. It has a population of 45 million and São Paulo itself has 19 million inhabitants. Despite the poor accident statistics, road safety has not been a political priority in Brazil; the focus has rather been for improved infrastructure ahead of the Soccer World Cup and the Olympics. Road safety is still largely seen in Brazil as a behavioral problem and there has been a lack of accountability for road safety across the three levels of government. The Bank wanted to advocate for stronger road safety support at federal level, but currently there is plenty of federal domestic funding available (limited need for Bank loans), while no political champion road safety has emerged. Nevertheless, there has been some progress. An iRAP for Brazil has been completed and two other states are seeking a capacity reviews. What are needed in the near future are strong political commitment and the urgent establishment of a key safety coordinating agency. A positive sign is that President Dilma Rousseff pledged her country's support for the UN Decade of Action for Road Safety in a 2012 speech to the UN General Assembly. The Global Road Safety Partnership, as part of the Bloomberg Philanthropies Global

Road Safety Program, also hosted a meeting of experts to increase advocacy efforts aligned with the Decade of Action for Road Safety in Brazil.

PARAGUAY

In Paraguay, there has been more enthusiasm for road safety than in Peru to the point where the government expressed interest in a stand-alone safety project. An iRAP has also already been conducted there. However, because of the small size of the economy and the likely limited funding envelope, it was decided instead to pursue a road safety component within a maintenance/rehabilitation loan and not to have two separate projects. The reason for this is affordability and that the recent successes with improved maintenance need to be nurtured. In this case the safety component is expected to comprise improved institution building, safe corridors, public education awareness, and improved emergency response times.

PERU

Peru has one of the worst road safety records in the region according to WHO, with 15.9 deaths per 100,000 people. Driver behavior is poor and speeding and alcohol consumption are major factors in many of the accidents. Government commitment toward road safety is limited. This is partly because there is little coordination between the various departments, but also because of the lack of awareness of the potential impact of road safety. The Bank accordingly introduced a "Safe and Affordable Transport" project, which had a road safety component. The idea was to introduce the safe corridor concept, whereby there would be a combination of road safety improvements including more stringent enforcement, road safety education initiatives, and more efficient emergency mechanisms. An iRAP assessment has been completed, with support from GRSF for 3,000 kilometers of Peruvian roads. The project was approved in December 2009, but was almost immediately restructured to allow the government of Peru to proceed with two urgent road sub-components using its own national funds. The timing was no longer opportune for a Bank loan and although the agreement was signed the remainder of the project was never made effective as the government was concerned about the deteriorating fiscal situation and especially the potential for serious inflation following a major downturn in the economy.

Since then, the Bank has had a difficult time in getting a further project on the table, but there is the possibility of a bridge project for the national network and/or a project involving rural and regional roads. In both instances the Bank insists there be a road safety component in line with its mainstreaming policy for road safety. A positive aspect in Peru is their insistence on mandatory coordination between the

Inter-American Development Bank (IADB) and the World Bank. IADB has focused more on creating awareness rather than actual projects.

Middle East and North Africa Region

The World Bank has been involved in fewer road safety-related projects in the Middle East and North Africa than any other Region. Excluding high-income countries, during 2002–2013, 1.3 percent of road projects with a safety component were from here compared with 25.3 from East Asia and Pacific, 20.9 from Africa, and 19.6 from Latin America and the Caribbean. There is only one active project with a commitment value of $40 million of which the safety content is $0.34 million.

Table E.5. Road Traffic Death Rates for 9 Countries in the Middle East and North Africa Region with a Population Exceeding 5 Million

Countries (population exceeding 5 million)	Population (millions, 2010)	Road Traffic Death Rate per 100,000 Population (2010)	Registered Motor Vehicles (millions, 2010)[a]
Egypt, Arab. Rep.	81.1	13.2	5.9 (2)
Iran	74.0	34.1 (1)	20.7 (1)
Morocco	32.0	18.0	2.8 (4)
Afghanistan	31.4	19.8	0.7
Iraq	31.7	31.5 (2)	3.4 (3)
Yemen, Rep.	24.1	23.7 (3)	1.0
Syria	20.4	22.9 (4)	2.1 (5)
Tunisia	10.5	18.8	1.5
Jordan	6.2	22.8 (5)	1.1

Sources: Primarily WHO Global Safety Status Report and World Bank data.
a. Excludes two-wheelers.

REPUBLIC OF YEMEN

The only active Bank-financed project with road safety components in MNA is the Republic of Yemen: Road Asset Management Project, which is in its early stages. There are two components containing road safety aspects. The first component is to improve road safety by financing engineering improvements such as better road markings and signage, better and more appropriately positioned speed control measures in built-up areas, better crash barriers and the removal of other deficiencies that cause an accumulation of fatal and serious accidents. The second intends to develop skills and build capacity in road safety by staff training in road safety audit, inspection and network safety management and the provision of other non-engineering training programs. This would facilitate the development of a safer roads investment plan. The project is off to a slow start due to low capacity of PMU staff, which has had difficulty in attracting and retaining suitable environmental and

social specialists. This in turn has delayed capacity building by our safeguard colleagues. As a result safeguard documentation has not been of a quality acceptable to the Bank. A similar capacity constraint exists for procurement, so that bidding documents have been delayed. The Bank team has also been facing issues on scheduling missions in the country due to limited availability of armored vehicles and the restriction on the time spent in the country.

Box E.2. A New Challenge to Road Safety: The Electric Bicycle

A new phenomenon in East Asia is the electric bicycle. In China the number has grown from a few thousand to 22 million in just 10 years, but their popularity is also gaining ground elsewhere in Asia as well as in the Netherlands and Germany. Annual sales in China have reached about $11 billion and the government is suddenly paying attention—but its urge to regulate is pulling it in two different directions. Until recently few laws to regulated electric bikes: they do not need to be registered nor do their drivers need a license, but unsurprisingly the electric bikes in use are involved in a growing number of accidents. Yet, on the other hand, the government also wants to encourage electric bicycles to curb the pollution and congestion created by other vehicles. Conflicting decisions by national and municipal authorities in China have demonstrated the difficulty of adapting to the new mode of transportation. In Shenzhen, electric bicycles were involved in 15 percent of all traffic accidents in 2011, and the city subsequently banned the e-bike. Others have followed suit, while some cities and provinces permit them. The Bank does not yet appear to have taken a position on this matter.

South Asia Region

Road accident rates are generally poor across South Asia; India has the best at 11.6 per 100,000 population and Pakistan the worst at 18.9. Three quarters of the accident victims are pedestrians, cyclists or motorcyclists. World Bank supported projects in South Asia have focused on helping regional governments to improve policies and regulations and establish road safety agencies. In India, Bangladesh, and Pakistan, the Bank has assisted government agencies in developing comprehensive road safety action plans, at both the national and state level as well as for specific cities like Dhaka and Lahore. The Bank has also assisted in projects, which include the development of manuals for safety audit, accident black spot investigations, road signs and markings, and computerized accident recording and analysis systems. In Bangladesh, nongovernmental organizations have undertaken comprehensive road safety education and public information campaigns in local communities with the support of the Bank.[20] The Bank supports 13 active projects in four states, with a total commitment value of $2.781 billion and the value of the road safety content $81 million.

Table E.6. Road Traffic Death Rates for 5 Countries in the South Asia Region with a Population Exceeding 5 Million

Countries (population exceeding 5 million)	Population (millions, 2010)	Road Traffic Death Rate per 100,000 Population (2010)	Registered Motor Vehicles (millions, 2010)[a]
India	1,224.6	11.6	115.0 (1)
Pakistan	173.6	18.9 (1)	7.9 (2)
Bangladesh	148.7	15.0 (3)	1.6 (4)
Nepal	30.0	17.4 (2)	1.2
Sri Lanka	20.9	13.7 (4)	4.0 (3)

Sources: Primarily WHO Global Safety Status Report and World Bank data.
a. Excludes two-wheelers.

Regionally, by type of intervention 44 percent are related to institutional capacity strengthening, 26 percent to infrastructure safety engineering, 16 percent to road user behavior, 9 percent to post crash care, and 5 percent to vehicle safety. Technical assistance has focused on the design and construction of better and safer roads. In India, the Bank has assisted in improving hazardous locations on the national highway and state highway networks, as well as the installation of safer road features and devices. In Bangladesh and the Indian states of Andhra Pradesh, Karnataka, Gujarat, Kerala and Uttar Pradesh, it has provided funding for improvements of accident black spots, installation of reflective traffic signs and road markings. However, road safety measures such as black spot elimination are increasingly seen as reactive as the potential of the safe systems approach is understood. In India so far it has been individual states that are taking the lead with the safe systems approach. The reaction from the federal government until recently has been slow, as it has been distracted by other priorities. Roadworthiness is another area where the Bank could push for change. Vehicle crash tests of some of the more popular cars in India have had disappointing results.

Three Indian state projects with significant road safety components are underway. The Second Karnataka State Highway Project, declared effective in July 2011, has a $11 million road safety improvement component. It followed the unsuccessful roads safety component in the preceding highway project in which only 16 percent of the allocated funds were disbursed due to non-performance by the appointed consulting firm. The project includes both strategic and institutional measures consistent with the 2007 Sundar Committee Report on road traffic safety and traffic management[21] and the findings of a road safety management capacity review. The project loan also contains a covenant to the effect that there will be a safe corridor demonstration program. However, ISRs report that lack of stakeholder interest and insufficient staff in the state level traffic and road safety cell, which is supposed to evolve as the lead agency, has seriously slowed initial progress. Although the

infrastructure measures for the demonstration corridors have been finalized, the component remains behind schedule. Meanwhile two other projects have recently been made effective. The Second Gujarat Highway Project has a $20 million road safety component and the Assam State Highway Project a $12 million component. No issues have yet been reported in Gujarat, but the Assam project is suffering from delays due to getting project funds released from the Finance Department of the government of Assam.

Box E.3. Road Safety Workshop in India

After facing criticism for doing little to improve road safety, the Indian Ministry of Transport has decided to set up an apex body to address all road safety related issues. At present there is only limited coordination in road safety matters among different ministries in central government and the states. The ministry also intends through executive order to amend the Motor Vehicles Act to increase penalties for traffic violations.[22] Because India has such a large population as well as a high annual road fatality rate, it was a priority for GRSF, which is conducting local workshops aimed at improving multi sector coordination as one of the activities of the "Road Safety in Ten Countries" program.[23] These workshops are founded on the safe systems approach and address the implementation of specific road safety management systems. The Indian workshop was held in Lucknow, the capital city of the state of Uttar Pradesh (UP), where there is a growing interest in road safety. Currently UP has the greatest number of fatalities among all Indian states. In particular, the road safety management system currently under the aegis of the State Road Safety Council needs to be improved beyond its advisory role with limited mandatory power. The workshop also focused on improving post-crash assistance and care in the special context of India and how to engage other stakeholders such as local volunteers and enforcement officers in this activity. The role that the civil society can play in reducing death from injuries is significant, but first legal instruments such as a "Good Samaritan" law need enacting.[24] In addition the World Bank through GRSF is applying the iRAP methodology to assist project corridors in three Indian states—Assam, Gujarat and Karnataka—to improve road safety on 3,000 kilometers of high-risk roads and develop road investment plans.

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[15] RoadPOL is a global police network that seeks to achieve accelerated transfer of road safety knowledge and experience through training arrangements and peer-to-peer agency reviews.

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[23] The workshop was formally inaugurated by Madhukar Jetley, adviser, Externally Aided Projects Department, government of Uttar Pradesh, who on this occasion highlighted the cabinet consideration of a statewide road safety policy to address the epidemic of road crash injuries in Uttar Pradesh.

[24] Championed by the Supreme Court of India, a Good Samaritan Law would encourage bystanders to help road accident victims. A survey in Indian cities found that 88 percent of respondents hesitate to assist a road crash victim because of fear of police harassment and legal hassles.