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Road Safety in Africa

Appraisal of Road Safety Initiatives In Five African Countries

Terje Assum

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Africa Region



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in Five Selected Countries in Africa*

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**Sub-Saharan Africa Transport Program (SSATP)
UNECA and The World Bank**

**The opinions and conclusions expressed in SSATP
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Summary

Upon the request of the World Bank, the Institute of Transport Economics, Norway did an appraisal of the road safety situation and road safety work in five African countries: Benin, Côte d'Ivoire, Kenya, Tanzania, and Zimbabwe. The overall objective of the evaluation was to identify key measures that would reduce fatalities, personal injuries, and material damage from road accidents in Africa. The information was collected through visits to the five countries. A report on the road safety situation of each country was then sent to the authorities responsible for road safety in each country, and their comments have been incorporated into the final report. A preliminary version of this report was presented at the Third African Road Safety Congress.

Road safety development in Africa

Between 1968 and 1990 road fatalities in Africa increased by 350 percent. Without some action this increase will probably continue as the number of motor vehicles increases. The number of people killed and injured in road accidents relative to the population in most African countries has not yet reached the same level as Europe and North America; but, the rate of those killed and injured relative to the number of motor vehicles is extremely high in most African countries. During the last five years, the number of motor vehicles in the five countries has increased from 21 to 63 percent, road accidents from 15 to 70 percent, fatalities from 28 to 57 percent, and injuries from 27 to 89 percent. Pedestrians and public transport passengers are the largest groups among the fatalities, about 30–40 percent each. In 1990 the accident risk for buses and taxis in Kenya was four times that of cars and light vehicles.

Review of road safety programs and activities

Five to seven ministries share the responsibility for road safety. All five countries have national road safety councils, founded between 1972 and 1995. The objectives of the

councils are good, but because of a lack of funding, implementing road safety measures is difficult. All five countries, except Zimbabwe, have a national road safety program. The Zimbabwe Traffic Safety Board has a program for its own activities, but this program is too limited to be considered a national road safety program. Kenya is the only country to have implemented a road safety program, which was in effect during the 1980s. Most activities established under the 1980 road safety program ceased after the end of the Finish assistance. In Tanzania a comprehensive road safety program was presented in 1996, but it is still waiting for Cabinet approval.

All five countries have accident data systems. Three countries admit that an unknown share of accidents are not recorded. The definition of a fatality varies from dead-on-the-road to dead up to 30 days after the accident.

Road planning and construction seem to be working well. Foreign assistance is common. Road infrastructure is given first priority, and safety problems seem to be relegated to a second level. The road engineering measures, such as roundabouts or speed humps, generally known to reduce accidents, will likely have the same effect in developing countries as in highly motorized countries.

Most countries face problems in financing road maintenance, and road safety may be compromised. Road signs are stolen or damaged, and replacement is costly and rarely carried out. Donors seem to have taken more interest in road maintenance lately, improving the chances for making road safety measures a part of road maintenance. The priority given to road safety aspects in road planning and maintenance reflects, to some degree, the priority of the donors rather than that of the recipient countries.

Although there is some road safety publicity in all five countries, most countries lack adequate budgets for publicity. The road safety information campaigns are not evaluated, and their effect on road accidents is unknown. Two countries have compulsory driver training in private driving schools, and three countries have no compulsory driver training. All five countries face corruption in driver testing

and license issuing, allowing unskilled drivers on the roads, and some countries have problems with forged licenses.

Some countries have mandatory vehicle inspection for all motor vehicles, and some countries for public service vehicles only. Public service vehicle inspection is inadequate.

Four of the five countries have some traffic education of school children, but there is a question of whether it reaches all schools and all children.

All countries have the basic legislation necessary for road safety work, though to some extent amendments are needed. These take a long time to enact.

All five countries have speed limits, in urban areas from 50 to 60 km/h, and in rural areas from 80 to 120 km/h. Zimbabwe's speed limit enforcement has improved after the recent introduction of the highway patrol, but fines are too low to prevent speeding effectively. In Tanzania the police claim that speed limits are enforced to a certain extent, but there is a shortage of vehicles and equipment. The same problem exists in Côte d'Ivoire and Kenya. In Benin speed limits are not enforced.

Drinking and driving is a problem in all five countries. In Kenya and Tanzania it was difficult to ascertain whether there is a legal limit, and if so, what it is. The enforcement of drinking and driving rules is difficult because of a shortage of equipment.

Pedestrians and passengers of public service vehicles make up the largest groups of accident victims, and seat belts may not be as important in these countries as in countries with a high number of passenger cars. But the mandatory installment of seat belts is important as the number of cars increases. Enforcing the wearing of seat belts does not seem to be a priority for the police in those countries where it is mandatory.

Enforcement of traffic rules is a problem in these countries. The police lack training, vehicles, and equipment. The police accept bribes, but to what extent they do is unknown.

Pedestrians are major victims of road accidents. More action to reduce pedestrian accidents is needed, as is research on preventing pedestrian accidents in Africa.

Emergency medical services are supplied, but scarcely outside the major cities.

The activities which seem to be functioning best are the accident recording systems, road engineering, and legislation. Legislation and engineering are important measures, and further extension and improvement of these measures still have a potential for reducing accidents. Organizational changes, funding, legislation amendments and enforcement are the most difficult activities to implement.

Most of the countries finance road safety activities through government grants. This financing is inadequate, especially for the activities outside road engineering; although these activities are much less expensive than those within engineering.

The foreign assistance for road safety work varies considerably between the countries. The 1985 evaluation of the Kenya road safety program stated that the training of national counterparts is a fundamental objective of any aid-funded project in a developing country.

Measures for sustained reduction of road accidents

The causes of road accidents usually pertain to road, vehicle, and human factors. The need for developing and evaluating countermeasures for accidents particular to Africa should not be neglected. However, there is no doubt that the main problem in Africa is the *implementation* of accident countermeasures rather than a shortage of road accident countermeasures unique to African conditions.

There are several conditions to sustainability in road safety work:

- Competence
- Political priority
- Funding
- Implementation
- Organization
- Monitoring and evaluation
- Time.

Of these conditions, political priority, funding, implementation, and monitoring and evaluation are the most important. Road safety has a funding potential: anyone who can afford a motor vehicle can also afford a few dollars a year for safety, paid as a fuel levy, an annual vehicle licensing fee, or a motor insurance fee. The problem is the political priority to impose such taxes on vehicle owners and to organize it so that is not used for other purposes.

More knowledge of effective countermeasures exists now than 30 to 50 years ago, when Western Europe and those found in Africa in the 1990s. But the implementation of road safety measures may take more time in Africa than elsewhere. Economic resources are scarcer, and a number of claims compete for these resources. And, although the implementation of road safety measures has also taken time in North America and Northern Europe, there is reason to be impatient: every year more people are being killed and injured on the roads.

Most effective countermeasures cost money, increase travel time, or restrict individual freedom. These side effects will cause opposition to the countermeasures, and opposition takes time to overcome. Politicians will be reluctant to implement measures that meet with opposition. Political priority is needed to implement effective road safety measures. Political priority can only exist when both a certain share of the population and the politicians feel convinced that the benefits of road safety measures outweigh their costs.

Monitoring and evaluation are necessary at all steps of a road safety policy or program to ensure that the proper action is actually carried out or that necessary adjustments are made. The results from monitoring and evaluations can be reported to decision-makers and the road users as a basis for more road safety action.

Possible action to improve the political priority is awareness campaigns — directed at the decision-makers and the people — that emphasize the costs or road accidents and the potential for accident reduction and savings. Motor insurance companies, health institutions, NGOs, and media should be engaged in persuading politicians to implement and the people to accept road safety measures. Effective demonstration projects should be used. Donor countries, having extensive experience in road accidents and countermeasures, should put pressure on any country receiving assistance for road projects to include road safety programs. African and regional cooperation in the field of road safety should be stimulated. Finally, action to enhance political concern should be integrated in road safety programs.

An African Road Safety Initiative

At the conclusion of the Third African Road Safety Congress, April 1997, an African Road Safety Initiative was proposed. The objective was to improve the road safety situation in Africa by increasing awareness among the decision-makers, politicians and the public, and developing better information systems and increased action by international organizations. Such an initiative can use the competence and capacity for road safety work that already exists in several African countries, improving and expanding this capacity in cooperation with international experts.

Overview

Road accidents in developing countries are increasing, and the number of those with fatalities and serious injuries is a considerable problem. While Western Europe and North America have succeeded in checking and even reversing the road accident trend, road accident fatalities in Africa went up by over 350 percent from 1968 to 1990 (Dhliwayo, 1997). Conversely, in the developed countries the number of persons killed declined after 1970. Along with human suffering, road accidents have economic costs equivalent to approximately 2 percent of GNP for developing countries (Dhliwayo, 1997). These include extensive use of scarce medical facilities for treatment of accident injuries and use of limited foreign exchange for replacement vehicles and spare parts. In 1990 Road accidents ranked number 12 as a cause of death and number 11 as a cause of life years lost in Sub-Saharan Africa. By 2020, road accidents are expected to be the number 2 cause of lost disability-adjusted life years in developing countries (Murray and Lopez 1996).

The Southern Africa Transport and Communications Commission (SATCC), in consultation with the Norwegian Institute of Transport Economics (TØI) has produced a number of working papers which highlight new approaches for improving traffic safety in the eleven countries of the Southern Africa Development Community (SADC). These papers emphasized that traffic accidents are a major health problem in the SATCC countries. The papers stated that this problem might be mitigated by well-designed and committed implementation of traffic management measures, as done in the Nordic countries. The papers provided frameworks and guidelines for improved traffic laws, highway codes, traffic signals, road-marking manuals, and better driver skills and general awareness of traffic safety.

With the goal of combating the deteriorating road safety situation in Africa, the United Nations Economic Commission for Africa (UNECA), together with other international

organizations, organized the First African Road safety Congress in Kenya in 1984 and the Second African Road safety Congress in Ethiopia in 1989. The Third African Road safety Congress took place in South Africa in 1997, where a preliminary version of this report was presented.

Little is known about what affect the two preceding congresses have had on the traffic situation in Africa, especially in countries that tried to implement the recommendations forwarded in 1984 and 1989. The World Bank therefore decided to carry out a traffic safety evaluation in a few selected Sub-Saharan countries. The countries selected for evaluation were Benin, Côte d'Ivoire, Kenya, Tanzania, and Zimbabwe.

Objectives of the evaluation

The Bank asked the Institute of Transport Economics, Norway to carry out this appraisal. The evaluation's goal was to identify key measures for reducing the number of road accident fatalities and personal injuries, as well as material damages caused by road accidents in African countries.

The study assesses:

- a) the causes of the high accident rates in African countries and the resulting high loss of lives and property,
- b) the requirements for a gradual and sustainable reduction of the high rate of accidents, loss of life and property to levels comparable to those in developed countries,
- c) how management capabilities of relevant public and private sector agencies may be strengthened to facilitate appropriate planning, programming, and implementation of the necessary road safety programs,
- d) how adequate, secure and sustainable financial resources for road safety programs may best be mobilized and managed,
- e) how to raise awareness about road safety among

policy-makers, road users, and the general public to facilitate the formulation and implementation of appropriate strategies aimed at promoting traffic safety.

Study execution

The information and data for the project were collected during visits to the five countries between January and March 1997. There were two visits to each country. Local consultants and two data collectors, one for the three English-speaking East-African countries and another for the two French-speaking West-African countries, interviewed people involved in road safety work.

Apart from the statistics on road accidents and motor vehicles, most of the information collected in this project is qualitative and, therefore, difficult to analyze.

The report on the road safety situation of each country included in the project was sent to the national road safety council and the ministry responsible for road safety in each country. Their comments have been incorporated into the final report.

The project terms of reference provided financing for 20 staff-weeks of expatriate consultants and 20 staff-weeks for local consultants. This broke down to an average four plus four weeks per country, including: analysis of the data, presenting the findings at the Third African Road safety Congress, and writing the final report.

Road Traffic and Accidents in the Selected Countries

Motorization

As new vehicles are registered, statistics on the number of vehicles may be unreliable, and many countries face problems in keeping records of vehicles no longer used.

Zimbabwe, having the highest density of motor vehicles, has less than one-tenth of the vehicle density of Great Britain. The vehicle density of Benin would be much lower if it excluded the estimated number of motor cycles.

Data on traffic volumes are not available in these countries. Figures have been calculated for some countries, but may be calculated differently in each country, making comparisons between countries unreliable; consequently, this paper does not include such statistics. However, for Kenya, some data are available on the amount of road traffic (Gekonge 1996, Table 1.11). These are shown in Table 2.

Road accident situation

The figures in Table 1 must be interpreted cautiously since both the number of accidents and injuries and the number of vehicles and inhabitants are inaccurate. Definitions may also vary, both regarding fatalities, for example, dead-on-the-road or dead within a certain time, and the number of motor vehicles, including motorcycles and mopeds. Ignoring possible errors, the road accident risk, expressed as fatalities per 10,000 vehicles is highest in Tanzania and Kenya, about 60, which is nearly twice the rate of the other countries. Excluding the motorcycles and mopeds from the number of motor vehicles in Benin, the fatality per vehicle rate is even higher than in Tanzania and Kenya.

Casualties per 10,000 vehicles are highest in Côte d'Ivoire, with Kenya and Tanzania about equal, then Zimbabwe, and Benin the lowest. The public health problem, expressed as fatalities per 100,000 inhabitants is highest in Zimbabwe and Kenya, about 10, which is about twice the rate of the other three countries and that of Great Britain.

During the last five years, the numbers of motor vehicles, road accidents, fatalities, and injuries have increased considerably in all five countries. The exception is Côte d'Ivoire, where road accidents and fatalities have decreased. Because the number of motor vehicles has increased by 63 percent and the number of injuries has increased by 34 percent during the same period in Côte d'Ivoire, the decreases in road accidents and possibly in fatalities may be due to incomplete statistics. With the possible exception of Côte d'Ivoire, the fatality and injury growth rates are alarmingly high.

Nature of the road safety problem

Statistics on fatalities and injuries by road user group are not available in Benin and Côte d'Ivoire. Table 6 shows that in Kenya, Tanzania and Zimbabwe, passengers and pedestrians are the most frequent road user groups among the fatalities. This is about the same percentage as the fatalities. Among the injury victims, the passengers are the largest group.

The situation in Côte d'Ivoire is similar to that of the three countries in Table 6; whereas motorcycle drivers and passengers are the two most frequent victim groups in Benin. In the latter, motorcycles seem to have the same passenger transport function as the minibuses in the other countries. This means that public service vehicle passengers and pedestrians are the main victim groups in all five countries. These findings coincide with other descriptions of the road accident situation in developing countries (Ross et alia, 1991), and differ from most industrialized countries, where drivers of private passenger cars make up the largest victim group and passengers the second largest group. The difference indicates that the optimal mix of accident countermeasures to be applied in Africa may be different from that of the industrialized countries. Even though a wealth of knowledge on road safety measures and their

Table 1. Number of motor vehicles, population and motor vehicles per 100 people in five African countries and Great Britain. 1995

	Benin	Côte d'Ivoire	Kenya	Tanzania	Zimbabwe (1994)	Great Britain
Motor vehicles	138,044*	199,937	435,893	252,000	470,556	25,369,000
Population (millions)	5.4	14.4	26.2	29.7	11.5	56.8
Motor vehicles per 100 people	2.6	1.4	1.7	0.8	4.1	44.7

* Including an estimated number of 100,000 motorcycles and mopeds

Table 2. Million km driven by vehicle type and year: Kenya

Year	Cars and light goods vehicles	Buses and taxis	Lorries	Total
1983	1668	116	612	2396
1984	1926	132	654	2712
1985	1996	151	726	2873
1986	2227	152	722	3101
1987	2921	198	908	4027
1988	3198	225	1012	4435
1989	3522	245	1099	4866
1990	3745	259	1166	5170

The total number of km driven has more than doubled from 1983 to 1990.

Table 3. Five-year growth rates in motor vehicles in five African countries. Percent

	Benin	Côte d'Ivoire	Kenya	Tanzania	Zimbabwe
Motor vehicles	61	63	31	27	21

Table 3 shows that the number of motor vehicles has increased considerably during the latest five years in the selected countries.

Table 4. Number of road accidents, fatalities and injuries, fatality and casualty rates in five African countries and Great Britain. 1995

	Benin	Côte d'Ivoire	Kenya	Tanzania	Zimbabwe(1994)	Great Britain
Road accidents	2,342	4,650	12,960	13,767	9,150	230,376
Fatalities	321	575	2,617	1,663	1,274	3,621
Injuries	2,082	16,700	22,993	12,625	16,140	306,885
Fatalities per 10,000 motor vehicles*	23.3	28.8	60.0	66.1	27.0	1.4
Casualties per 10,000 motor vehicles*	174	864	587	567	370	122
Fatalities per 100,000 inhabitants	5.9	4.0	10.0	5.6	11.1	6.4
Casualties per 100,000 people	44.5	120.0	97.7	48.1	151.4	546.7

* Including an estimated number of 100,000 motorcycles and mopeds in Benin

Casualties = fatalities + injuries

Table 5. Five-year growth rates in road accidents, road fatalities and road injuries in five African countries. Percent

	Benin	Côte d'Ivoire	Kenya	Tanzania	Zimbabwe
Road accidents	70	-32	15	36	46
Road fatalities	47	-5	41	57	28
Road injuries	89	34	35	27	48

Table 6. Fatalities and injuries by road user groups in Kenya, Tanzania and Zimbabwe. Percent

	Kenya (1995)		Tanzania (1995)		Zimbabwe (1994)	
	Fatalities	Injuries	Fatalities	Injuries	Fatalities	Injuries
Drivers	11	10	6	5	23	20
Passengers	34	55	41	58	34	44
Motorcycles	2	2	2	3	6	3
Cyclists	9	7	11	10	2	10
Pedestrians	44	26	40	24	35	23
Total	100	100	100	100	100	100
No of fatalities	2,617		1,663		1,274	
No of injuries	22,993		12,626		16,140	

Table 7. Accidents per million vehicle km by vehicle category and year. Kenya

Year	Cars and light goods vehicles	Buses and taxis	Lorries
1983	2.66	5.88	1.69
1987	1.36	6.08	1.38
1990	1.13	4.89	1.05

effects exists in the industrialized countries, the difference in types of accidents may require that special road safety measures be developed for African countries.

Data on road accidents by time of day, week, year, and by geography were unavailable in these countries; therefore, this project will not analyze such variations.

The tables calculate the road accident rates or risk as the number of fatalities or casualties to the number of vehicles. The traditional way of calculating such risk in developed countries is the rate of fatalities or injuries to the road traffic, i.e., the number of km driven. However, such data are not available for these countries, except for Kenya, as shown in Table 2.

For the years 1983 through 1990, accident risk is computed as accidents per million vehicle km for light goods vehicles, for buses and taxis and for lorries (Gekonge 1996, Table 1.11). Table 7 summarizes these statistics.

Table 7 shows considerable differences in accident risk between the vehicle categories. These differences would likely have been even greater if the table had used casualties instead of accidents because buses and taxis are likely to have more casualties per accident than the two other vehicle categories. Table 7 confirms the importance of public service vehicle accidents, which are shown in Table 6. Despite the 15 percent increase in the number of road accidents in Kenya during the latest five years (Table 5), there is still a considerable decrease in the risk of accident for all three vehicle categories over these years shown (Table 7).

Comparisons with other countries

Table 4 shows the accident, fatality and casualty rates of the five countries together with the same rates of Great Britain. The difference in fatality per vehicle rate among the five countries and Great Britain is striking. Tanzania's

rate is forty-seven times higher than the British rate and Benin's rate is almost seventeen times higher. Great Britain has one of the lowest fatality per vehicle rates in the world. But the fatality/vehicle rates for Western Europe and North America are in the range of one to five (The United Republic of Tanzania, 1996, Figure 17b).

For India, Malaysia, Mexico and Chile the figures are taken from the International Road Federation 1995. Figures are for the latest year available. Figures for Xinjiang are taken from Muskaug (1995). Figures for Russia are taken from Kuznetsov, 1997

Table 8 shows the fatality rates for the five countries and those of some developing countries in Asia and Latin America. Comparisons between countries in these rates are difficult. Both definitions (dead-on-the-road vs. dead-within-30-days after the accident, including motorcycles and mopeds among the motor vehicles) and the quality of registration may vary considerably between countries.

The fatality per vehicle rate is higher in African countries when two-wheelers are not counted among the motor vehicles. The fatalities per population rates of the five countries are in the same range as India, China, Mexico and Chile, but considerably lower than that of Malaysia and Russia. These two countries, which may be in a stage of motorization between Great Britain and Africa, have a much greater public health problem. The question is whether the African countries will have to reach the fatality per inhabitant rates of Russia or Malaysia before they take serious action.

Main findings

The fatality per vehicle rates of the five selected countries are alarmingly high compared to countries outside Africa. Pedestrians, passengers of public service vehicles, and possibly drivers and passengers of motor cycles are the main victim groups. These groups may change as the number of passenger cars and possibly the numbers of motor cycles and bicycles grow. But the number of motor vehicles per 100 people will not reach a European level for many years to come. Pedestrians and public service vehicle passengers will likely remain the main victim groups for a long time.

Table 8. Fatality rates in five African countries and in India, Malaysia, Xinjiang province China, Mexico, Chile, Russia and Great Britain.

Country	Fatalities per 10,000 motor vehicles	Fatalities per 100,000 inhabitants
Benin	23.3*	5.9
Côte d'Ivoire	28.8	4.0
Kenya	60.0	10.0
Tanzania	66.1	5.6
Zimbabwe	27.0	11.1
India	131.2 27.5*	6.7
Malaysia	16.7 7.2*	25.1
Xinjiang, China (1992)	82.0 54.0*	8.0
Mexico	4.7	6.2
Chile	15.1	12.5
Russia	11.0	22.4
Great Britain	1.4	6.4

* Including motorcycles and mopeds in the number of motor vehicles.

For India, Malaysia, Mexico, and Chile the figures are taken from the International Road Federation (1995). Figures are from the latest year available. figure for Xinjiang are taken from Muskaug (1995). Figures for Russia are taken from Kuznetsov (1997).

Review of Road Safety Work and Activities

The institutional framework

Ministries involved in road safety work

A number of ministries share responsibility for road safety work in the five countries: in Benin six ministries, in Côte d'Ivoire seven ministries, in Kenya six ministries, in Tanzania seven ministries, and in Zimbabwe five ministries. The number of ministries involved in the road safety work shows the many aspects of this field — engineering, education, enforcement, emergency medical services, and finances. This is not unique to Africa.

The coordination of the different aspects of the road safety work between the ministries and government bodies involved seems to be a problem in all countries. There is also a certain amount of disagreement among the ministries about where the main responsibility of road safety work should be.

BENIN

The ministries involved in road safety activities in Benin are the following:

- *The Ministry of Public Works and Transport (MTPT)* coordinates all activities regarding road safety and the National Centre of Road safety (CNSR), a directorate belonging to this ministry.
- *The Ministry of the Interior, Security and Territorial Administration (MISAT)* regulates road traffic within urban areas (police), road traffic controls, and intervenes in case of road accidents.
- *The Ministry of Health* is responsible for emergency services and medical care of the injured in hospitals.
- *The Ministry of National Defense* controls road traffic and intervenes in case of accidents, mainly in rural areas (military police/gendarmerie).
- *The Ministry of Finance* is responsible for insuring vehicles through the National Society of Insurance (SONAR), the only insurance company in the country (public).
- *The Ministry of National Education* is responsible for educating school children in road and traffic safety issues.

There are difficulties in cooperation among the ministries, and it is often difficult to establish responsibility for the costs of actions and campaigns. Different agencies participate in road traffic controls without well defined responsibilities. In addition, they lack resources, such as cars, motor cycles, radar, radios and telephones.

CÔTE D'IVOIRE

The following ministries are involved in road safety:

- *The Ministry of Economic Infrastructures* (The Delegated Minister charged with Energy and Transport) defines and monitors road safety policy and is responsible for the OSER, the Office for Road safety. It plans and implements road construction, rehabilitation, and maintenance financed through ordinary government budgets.
- *The Ministry of Defense* enforces road traffic legislation through the military police (gendarmerie), and organizes emergency services through the fire brigades.
- *The Ministry of Interior Security* enforces road traffic legislation through the police corps (in towns).
- *The Ministry of Health* is responsible for treating victims of road traffic accidents in public hospitals and for organizing emergency services through SAMU, which is a self-sustained ambulance service that demands payment for services rendered.
- *The Ministry of Primary Education* is responsible for educating school children in road safety.
- *The Ministry of Trade* is responsible (with the Ministry of Transport) for SICTA, the company charged with tech-

nical control of vehicles. SICTA is a private company functioning on a cost-covering charge for services basis.

- *The National Bureau of Technical and Development Studies (BNEDT)*, reporting directly to the President's office, is responsible for road planning and construction involving budgets based on cooperation with international agencies — practically all new road construction.

The ministries are not cooperating very well. Coordination is often difficult when a large number of agencies participate in, for example, a committee. Communication is slow and often subject to bureaucratic restrictions.

Cooperation between the police and the Road safety Office (OSER) on preparation of road accident statistics is often slow and difficult. The police have no obligation to release statistics, and police and gendarmerie use different forms for collecting information about accidents. OSER does not have enough equipment and manpower to collect, treat, and analyze statistics efficiently.

Police and fire brigades have difficulty collaborating at accident sites. Police arrive late, and, meanwhile, the fire brigade has to do police work, like directing traffic. This work obstructs the evacuation of the injured people.

SICTA, the private company in charge of technical control of vehicles has never been controlled by the ministries.

KENYA

The main responsibility of the Ministry of Public Works and Housing (MPWH) is road construction and maintenance; and road safety is a consideration when roads are constructed and maintained. The Road safety Unit, which is the secretariat of the National Road safety Council (NRSC), is within the MPWH. This ministry also employs the chairman of the NRSC.

The road safety activities and responsibilities of the Ministry of Transport and Communication (MTC) lie within the usage of roads. Activities include education of road users, radio and TV programs, and other media. There seems to be some disagreement between the MPWH and

the MTC about the main responsibility for road safety work.

There is a problem of coordination between these two ministries. The chairman and the secretary of the NRSC report to the Permanent Secretary of the MPWH. The Permanent Secretary of the MTC would also like to instruct the chairman and the secretary, but he has to go through the PS of the MPWH. This causes some friction.

There is also disagreement between the Kenya Revenue Authority and the Ministry of Transport and Communications about the Registrar of Motor Vehicles Department and its annual revenue of about Sh. 4.8 million (almost 1 million USD).

The Ministry of Education is responsible for traffic education. The police report to the Office of the President.

TANZANIA

Seven ministries are involved in road safety work in Tanzania. They are:

- *The Ministry of Works* is responsible for planning programs, axle load control, traffic engineering, and road infrastructure.
- *The Ministry of Communications and Transport* handles licensing of vehicles and the National Institute of Transport (NIT).
- *The Ministry of Home Affairs* enforces vehicle testing and records accidents.
- *The Ministry of Finance* is responsible for vehicle registration and issuing driver licenses after the police have tested candidates.
- *The Ministry of Health* is responsible for treating the injured.
- *The Ministry of Information and Broadcasting* manages public awareness.
- *The Ministry of Education* oversees the road safety curriculum for schools.

The ministries could cooperate better. The program proposing organizational changes in the road safety work may have made the coordination more difficult. There is disagreement about the suggested transfer of responsibility

Table 9. Ministries involved in road safety work by country

Benin	Cote d' Ivoire	Kenya	Tanzania	Zimbabwe
Public Works and Transport	Economic Infrastructures	Public Works and Housing	Works	Transport and Energy
Interior, Security and Territorial Administration	Defense	Transport and Communication	Communications and Transport	Home Affairs
Defense	Interior Security	Ministry of the President	Home Affairs	Justice, Legal and Parliamentary
Health	Health	Health	Health	Health
National Education	Education	Education	Information and Broadcasting	Education
Finance	Trade	Kenya Revenue Authority		

for the secretariat of the National Road Safety Council and for the vehicle inspection from the police to the Ministry of Works. It is difficult to say how cooperation between the ministries could be improved. But a pending situation, like disagreement over a proposed change, is probably worse than the situation before the change was suggested or after the possible implementation of the change.

ZIMBABWE

The ministries involved in road safety in Zimbabwe are primarily the Ministry of Transport and Energy and The Ministry of Home Affairs, through the police. The Director of Roads is involved, but he is part of the Ministry of Transport and Energy. The Ministry of Education is responsible for traffic education of school children and the Ministry of Health for the emergency medical services and hospital treatment of accident victims. The Ministry of Justice, Legal and Parliamentary Affairs is responsible for the legislation and amendments to the Road Traffic Act.

The National Road Safety Council

All five countries have a national road safety council, even if their names, their history, and their responsibilities vary. The Zimbabwe Traffic Safety Board began in 1972; Côte d'Ivoire established the National Road Safety Council in 1995.

The councils seem to have some common problems. Their objectives are good enough, but most of them seem to have difficulty in implementing road safety measures.

The councils have nine to twenty-two members. The rather large number of members makes meeting difficult. In Kenya, the council does not meet unless all twenty-two representatives are able to attend, a rule which encourages few meetings. In other countries the representatives will send their deputies or even lower officers, thus blocking the council's decision-making capacity. Some councils are part of a ministry and may have a conflict of loyalty when disagreeing with their parent ministry. Most councils have funding problems.

The Secretariat of the Road Safety Council

The road safety councils have a secretariat, but the organizational situation varies. In Benin, Côte d'Ivoire, and Kenya the secretariats are the road safety units within a ministry. In Kenya the unit has two employees. In Zimbabwe the council has a secretariat with a rather large staff. In Tanzania the traffic police, rather than the road safety unit within the ministry responsible for road safety, is the secretariat of the council.

Road safety activities

The road accident data system

Accident recording systems produce annual road accident statistics. Benin and Côte d'Ivoire have manual accident data systems. The other countries have partly or fully computerized systems, and all countries use police data as the source. Several countries have problems with the police sending the accident reports to the central compiling unit in time. Kenya and Tanzania claim that all injury accidents are included in the statistics because insurance requires a police report. Benin, Côte d'Ivoire, and Zimbabwe admit that an unknown share of the accidents is not recorded. This is a common problem in road accident statistics. For example, in Norway it is estimated that only 36 percent on the road accidents with personal injuries are reported to the police and included in statistics (Borger 1991). The definition of a fatality varies from dead-on-the-road to dead some time after the accident.

Road engineering

Road planning and construction produce new roads, and seem to be working well in all countries. Foreign assistance is common in road planning. Road infrastructure receives first priority, and safety problems are relegated to second level in planning. Standards and guidelines for road design are usually those of the home country of the expatriate experts. Zimbabwe reports that although compromises are necessary for funding reasons in using international guidelines, road safety standards are never compromised. Speed reducing devices, such as humps, are used in most countries, especially close to schools.

The road engineering measures, such as roundabouts or speed humps, generally reduce accidents (Elvik, Vaa and Østvik, 1989). It is unknown whether they will have the same effect in developing countries as in highly motorized countries. But they are likely to do so, because they influence physical forces or road user behavior directly.

Most countries have problems financing road maintenance, and road safety aspects may be compromised. All five countries have problems with theft and damage of road signs and the costs of replacing them.

Lately, donors seem to be taking more interest in road maintenance. This should make more room for road safety in road maintenance. Road maintenance, including black spot improvement, seems to be improving. This may be a consequence of increased donor interest. Potholes are filled and roads are being resurfaced to a larger degree than before, even if road maintenance is still inadequate.

The priority given to road safety aspects in road planning and maintenance seems to reflect the priority of the donors rather than that of the recipient countries.

Road safety publicity

There is some road safety publicity in all five countries. Most countries have a road safety week every year, or some other regular publicity activities. Most countries have deficient budgets for publicity. The objective of the road safety publicity seems to be the changing of road users' attitudes and thus their behavior. Publicity does not generally create acceptance for restrictions, such as speed limits and enforcement; nor does it demand better road safety, or that authorities take actions to reduce accidents. The extent of road safety publicity varies, but the people working with it seem to overestimate its impact. Other people interviewed doubt that most road users will even notice the publicity or the road safety weeks.

The research on road safety publicity shows a great variation in effect. Generally, publicity alone has a limited effect, but publicity may be effective when used with other road accident countermeasures such as speed enforcement (Elvik, Vaa and Østvik, 1989). The contents, form, and amount of the publicity may vary tremendously, and the effects are likely to depend on social and cultural factors; therefore, research results from highly motorized countries cannot be considered valid for other countries.

Driver training and testing

Benin and the Côte d'Ivoire have compulsory driver training in private driving schools. Kenya, Tanzania and Zimbabwe have no compulsory driver training but claim that most people receive training from driving schools. All five countries seem to have problems with bribery in driver testing and issuing of licenses, leading to the risk of getting unskilled drivers on the roads. Forged licenses are also

Table 10. The National Road Safety Council*: Institutions involved by country and year of establishment

Benin 1986	Cote d'Ivoire 1995	Kenya 1982	Tanzania 1977	Zimbabwe 1972
Public Works and Transport	Defense	Public Works and Housing	Works	Transport and Energy
Finance	Interior	Transport and Communication	Communications and Transport	Home Affairs
Works	Justice	Ministry of the President	Home Affairs	Education and Higher Education
Justice	National Education	Education	Information and Broadcasting	Justice, Legal and Parliamentary Affairs
Health	Infrastructure	Health	Prime Minister's Office	Insurance Council of Zimbabwe
Industry	Transport	Attorney General's Office	National Institute of Transport	Bus Company
Interior, Security and Territorial Administration	Health	Nairobi City Council	National Insurance Corporation	Other private businesses or organizations
Trade	Works and Public Sector	University of Nairobi	British Petroleum	
National Education	Economics and Finance	Automobile Association of Kenya Kenya Transport Association	Chakuwa Jali (organization for accident victims) National Lottery	

*The name of this body varies between the countries.

a problem in some of the countries. Zimbabwe seems to have solved this problem by issuing metal driver's licenses.

Vehicle inspection

Benin and Côte d'Ivoire have mandatory annual vehicle inspection for all motor vehicles, and Kenya, Tanzania, and Zimbabwe have mandatory inspection for public service vehicles only. Nevertheless, in Côte d'Ivoire only 50 percent of the vehicles are inspected.

Although the public service vehicles are an important category, the inspection of these vehicles seems to be deficient in at least two ways. Because these vehicles drive long distances, annual inspection may be infrequent. There is also the problem of good spare parts for one vehicle being taken out after inspection for use by the next vehicle being inspected. To solve this problem, roadside inspection, along with inspection in the inspection centers, will be necessary.

Although privately owned vehicles are not as common as in Europe, mandatory inspection of vehicles beyond a certain age should be considered.

Research on mandatory vehicle inspection in motorized countries tends to find little or no effect on road accidents (Elvik, Vaa and Østvik, 1989). However, because the economic basis for maintaining vehicles and the availability of spare parts are likely to be different in motorized countries, vehicle inspection may have another impact on road safety in Africa.

Traffic education of school children

School children are receiving traffic education in all countries, except Tanzania. In some countries it is part of the curriculum; in others it is an option for interested teachers. Lack of funding may limit the number of schools reached by the traffic education efforts of the programs.

Table 11. Speed limits, km per hour, in urban and rural areas, blood alcohol concentration (BAC) limit and seat belt rules by country

Speed limit	Benin	Côte d'Ivoire	Kenya	Tanzania	Zimbabwe
Urban	50	55	50	50	60
Rural	90	80/120	100	100	120
-buses		90	80	80	80
-heavy goods vehicles		75	80	80	80
BAC limit	% 0.08	0.08	No limit?	0.08?	0.08; 0.15
Seat belts					
Installed	Not mandatory		Not mandatory		Mandatory in front seats
Wearing	Not mandatory	Mandatory	Not mandatory	Mandatory in front seat	Mandatory in front seats

Education seems to emphasize road signs, which may not be the most important aspect, considering that the lack of road signs is a problem in the five countries.

Legislation and enforcement

The basic legislation necessary for road safety work is established in all countries, though some amendments are needed. Several countries have proposed amendments to their Road Traffic Act pending approval by the Cabinet or Parliament. The time it takes to make amendments and have them enacted is a problem.

Speed limits

All of the countries have speed limits. The limits in Zimbabwe are somewhat higher than normal, especially in urban areas. In the other countries the speed limits are reasonable, but all five countries have problems enforcing the limits. Because speed limits are rarely posted and the signs are often stolen, drivers caught speeding in urban areas can claim that they were unaware of the speed limit.

Zimbabwe seems to be improving on speed limit enforcement after the recent introduction of the highway patrol, with a staff of some 60 officers. According to the Zimbabwe Traffic Police all major roads are patrolled every day, on weekends even by night. The highway patrol obtained 20 more motorcycles and 20 more vehicles in February 1997.

The low fines are, however, a problem, especially for enforcing the speed limits for public service vehicles.

In Tanzania the police claim that speed limits are enforced to a certain extent, but there is a shortage of vehicles and equipment. The same problem exists in Côte d'Ivoire and Kenya. Benin does not enforce speed limits.

Drinking and Driving

Drinking and driving is a problem in all countries. In Kenya and Tanzania it was difficult to ascertain if there is a legal limit and, if so, what it was. Even high ranking road safety officers were unsure, which indicates that drivers probably do not know the blood alcohol content limit, and that it is rarely enforced.

The enforcement of drinking and driving restrictions is difficult because the equipment is largely missing. If breathalyzers are not legally accepted as evidence, those suspected of drinking and driving will have to be taken to a doctor for a blood alcohol test. Drivers will often refuse to have a sample taken, and if enough time has passed, the driver becomes sober. Police officers are therefore not motivated to enforce drinking and driving rules.

Drunk drivers can of course be stopped for other offenses to the traffic act and be prosecuted for careless or reckless driving.

Seat belts

Seat belts have been effective in protecting drivers and passengers of passenger cars against death and serious injuries. But because pedestrians and passengers of public service vehicles are the largest victim groups in the countries studied in this project, seat belts may not be as important as in countries with a more passenger cars. On the other hand, after the liberalization of the economies the number of passenger cars has increased and will probably continue to increase. The mandatory installment of seat belts is important as the number of cars increases. The enforcement of seat belt wearing does not seem to be a priority for the police, even in countries where it is mandatory.

Enforcement problems

Enforcement of traffic rules is a problem in all countries. The police lack training, vehicles, and equipment. In all five countries there are reports of police accepting bribes from traffic offenders, although it is difficult to assess the extent of this problem. In Benin and Côte d'Ivoire, even government representatives admit that the corruption in enforcement is a major problem in road safety work.

In Kenya the Automobile Association has suggested that citizen groups be established to monitor police bribery. The accepting of bribes seems to be a problem not only with the police officers enforcing the rules on the road, but also with their superiors and even the magistrates. In Zimbabwe the police complain about the fines being so low that people do not care about being fined, and it seems to take a long time to increase the fines.

Pedestrian accident countermeasures

In most African countries, pedestrians are the major victims of road accidents. The factors contributing to these accidents are many: the high speed of motor vehicles, drivers not seeing pedestrians or ignoring their rights to cross streets and roads, poor visibility at night, drunk drivers, as well as drunk pedestrians, careless drivers, and careless pedestrians. And adults, both drivers and parents, have a responsibility to protect children from road accidents.

Pedestrian crossings are made but not respected. Signs are stolen, and zebra stripes wear out without being repainted. In Zimbabwe there are pedestrian crossings on roads with 80 km/h speed limits. Although raised pedes-

trian crossings reduce speed and accidents, they have not been introduced in these countries.

Speed humps, used in towns and cities, reduce speed and accident risk as much as 50 percent (Elvik, Vaa and Østvik, 1989). But if they are too high and not posted, they may make drivers lose control, especially at night when they are difficult to see. However, this risk is minor compared to the accident reducing effect. In some residential areas in Lusaka, Zambia, local people have extended the humps on to the shoulders of the street. They do this to prevent car drivers from avoiding the humps by driving on the shoulder, a clear indication that the speed humps are popular among the residents.

Pedestrians have a priority when crossing on green lights, but turning drivers may be concentrating more on other drivers than on pedestrians.

In towns and cities, street vendors occupy sidewalks, forcing pedestrians into the streets. There are also problems with pedestrian vendors coming onto the streets to sell goods to cars stopped for red lights.

Pedestrian bridges have been built, but unless well planned and constructed, pedestrians do not use them. Pedestrian bridges are also sites of petty crime, making people prefer to cross on the road to avoid this problem.

More actions to reduce pedestrian accidents are needed, as is research on how to solve the pedestrian accident problem in Africa. Pedestrian and child safety in urban areas were studied in Kenya and Egypt (ECA, 1997); this project could be the basis for further research on pedestrian problems and countermeasures against pedestrian accidents.

Specific actions to reduce pedestrian accidents are described in Chapter 4.

Road safety research

Although some road safety research has been done in all five countries, none has been systematic. In some countries research carried out within the road safety council, in others by the police or a university. Evaluation of road safety activities is needed in all five countries, and research is also needed on road safety problems unique to Africa. This research should be undertaken by an independent research institution, such as a university. There is the capacity for road safety research in these countries, but funding and the organization are the problems.

Emergency medical service

Emergency medical services are supplied, but they are a problem outside the major cities. Some countries have private ambulance systems, even helicopter rescue, which help those who can pay for the service. In Zimbabwe the private emergency services arrive at accidents without considering if victims can pay for service.

In Benin the police have the authority to require vehicles to transport accident victims. In Côte d'Ivoire the fire brigade is responsible for the transport of road accident victims. This seems to be working well in cities with fire brigades.

Otherwise, injured people have to rely on the help of passing "good Samaritans" for transport to hospital. Except for Côte d'Ivoire, where people seem to be reluctant to be involved in helping out in accidents, people seem to be helpful in providing transport to hospital. Poor telecommunications is a problem in calling for help.

Though most countries have hospitals spread out over the country, not all hospitals have doctors on call or the equipment needed to treat badly injured people. Payment for medical service may also be a problem.

Overall countermeasure implementation

The accident recording system, road engineering, and legislation seem to be the best functioning areas. But because legislation and engineering are important measures, further extension and improvement of these measures still have a potential for accident reduction, maybe even to a greater degree than those measures functioning less well. Because engineering measures are effective and not controversial, and their costs can be included in road construction and maintenance costs, these measures may be easier to implement than most other measures.

Organizational changes, funding, legislation amendments and enforcement are the most difficult activities to implement. This is probably because they can easily conflict with other interests. Chapter 4 describes possible actions to improve countermeasure implementation.

Road safety programs

There are more differences than similarities in road safety programs in the five countries. In Benin and the Côte d'Ivoire the road safety programs are the road safety com-

ponents of the World Bank restructuring programs for the transport sector. In Kenya, a road safety program existed in the 1980s, and a Cabinet memorandum recommending accident countermeasures was produced in 1991. In Tanzania an extensive road safety program was presented in 1996. In Zimbabwe there is no national road safety program, but the Zimbabwe Traffic Safety Board has a five-year program for its own activities.

BENIN

A road safety program consisting of three projects was conceived in 1995. These projects make up the road safety part of the Transport Sector Program, which has been initiated with assistance from the World Bank.

The projects entail (a) creation of a data bank for road accident statistics; (b) implementation of an awareness and education program; (c) strengthening of the centers for technical control of vehicles. The main obstacle to realizing the road safety program has been a lack of funds.

CÔTE D'IVOIRE

Complete in 1989, the Road safety Program will be implemented within the frame of the Transport Sector Plan, which is now under negotiation with the World Bank. Different donor agencies will be approached for financing. The main goals and activities of the program are:

- 1) improving the technical control of vehicles
- 2) making buses install special speed reduction equipment
- 3) improving police and military police (gendarmerie) control of vehicles
- 4) creating a professional driving license (there is now one uniform license)
- 5) providing equipment and human resources at the Office for Road safety—training driving teachers and professional drivers
- 6) revising driving school regulations
- 7) reorganizing the Office for Road safety
- 8) forming three traveling road commissions for "control of controllers"
- 9) launching national and regional awareness campaigns for road safety
- 10) treating black spots.

Information on the cost of the program is not yet available. It is nevertheless assumed that various sources of financing will be needed. The World Bank, the African Development Bank, and France will be approached. Financing can probably be arranged soon, within three years.

The World Bank's priority is concentrated on numbers 4, 5, and 7 as well as on allowing for more liberalized import of used spare parts with fewer customs duties (under 1). Additionally, the Bank stresses that curbing police corruption requires political will.

The vehicle control was privatized in 1990, but there still seems to be a need for a more efficient vehicle control. Speed limiters were supposed to be introduced, but no action on this has yet been taken.

A study on reorganization of the Office for Road safety (OSER) has begun. With a more independent status OSER would be granted its own sources for funds. Primarily, it is expected that OSER will benefit from a larger share of the insurance tax, which now constitutes 1.25 percent on the profit of the insurance companies. OSER has also proposed introducing a tax on spare parts (contrary to the World Bank's opinion).

Traveling commissions to reduce police corruption have been introduced. Their effect is, however, doubtful because they seem to concentrate more on controlling road users. Financing is being requested for implementation of more costly initiatives.

KENYA

The Kenya road safety program of 1980 (Ministry of Transport and Communications et al., Kenya, 1980), supported by Finland, proposed organizational measures, enforcement, an accident investigation committee, driver training, vehicle inspection, road planning and maintenance, first aid training, information and education, and road safety research. The objective of the project was to improve road safety in Kenya.

The Kenya road safety program came to an end in 1991. As part of the conclusion of this program the National Road safety Council prepared a Cabinet memorandum on measures to enhance safety on Kenyan roads. This memo recommends the following twenty-four countermeasures:

- Educate children.
- Review the driving curriculum immediately.
- Issue PSV driving licenses based on a special course.
- Establish facilities for training driving instructors.
- Separate the roles of inspector of driving schools and officer-in-charge of driver testing unit.
- Make funds available for more media, education, information, and public campaigns.
- Increase road maintenance budgets vis-à-vis new road development to enable road safety measures.
- Allocate funds to increase the capacity of congested roads, correct dangerous spots, and construct bypasses.
- Provide pedestrian facilities in urban areas.
- Standardize engine sizes for buses and lorries to facilitate denial of licenses to imported large engines.
- Make WHO safety requirements for imported vehicles mandatory.
- Review PSV design for PSVs and seek approval of the Kenya Bureau of Standards to enhance safety and comfort. Discourage use of open vehicles to ferry people.
- Systematically introduce speed governors in all PSVs.
- Amend the Act on vehicle inspection to include inspection of private vehicles, and license competent private persons to inspect private vehicles older than five years once a year before annual road licensing is granted.
- Amend the Traffic Act to put all PSVs at par in regard to routes and consequential strengthening and expansion of Transport Licensing Board with authority to oversee the operation of PSVs.
- Set up special teams to withdraw licenses for certain offenses if and when the minister deems necessary.
- Make fines instant for minor offenses and authorize the police to collect and use the money to strengthen their activities.
- Set up a National Road safety Fund for use by NRSC in its activities.
- Strengthened the Council Secretariat by recruiting professionals.
- Trim the present council to a maximum of 10 members.
- Form a special steering committee to the council, consisting of permanent secretaries of the Ministry of Transport and Communications and the Ministry of Public Works and the Commissioner of Police.

- Start negotiations with the financial institutions to increase the repayment period for PSV operators.
- Start special courses for PSV drivers.
- Encourage PSV owners to employ and retain PSV drivers by pegging the issuance of Transport Licensing Board licenses, and insurance on the name of drivers and conductors and by payment of benefits stipulated in the Kenya labor laws.

The status of this memorandum is unsettled. It seems, however, that the memorandum is still a proposal, still awaiting Cabinet approval almost six years later. The reason given, after several probes, was that some of the proposals are controversial. Part of the implementation problem seems to be that the PSV operators act as a pressure group, even if they do not have a formal organization.

TANZANIA

An extensive road safety program was ready by July 1996 (United Republic of Tanzania, 1996). The program comprises all areas of road safety and, if implemented, should have a great potential for reducing the road accident problem of Tanzania. However, as of February 1997, the government had not yet approved the program.

The main objectives and activities of the program are:

- Establish a road safety organization capable of managing a multi-sector integrated approach to the road safety problem with long- and short-term plans.
- Increase the quality of life in Tanzania by preventing accident occurrence and by minimizing the consequences of road accidents.
- Prolong the life of the road network through effective vehicle and axle load control.

A total of fourteen goals, and a great number of activities to reach these goals, is described. A budget is proposed, supported by domestic sources. Financial assistance is proposed for short- and medium-term activities. Expatriate experts are involved on a short-term basis; the amount of involvement is described in the program.

ZIMBABWE

The Zimbabwe Traffic Safety Board has a five-year program whose activities include:

- reducing accidents/totals/rate by 15 percent, presented to two million Zimbabweans, 20 percent of the present population
- reducing strain on medical services
- replacing vehicles and equipment purchased in 1996
- presenting traffic safety to 25,000 teachers
- drafting another five-year program based on the experience gained for the years 2001 to 2005 if the present plan has been successfully implemented—if not roll it
- presenting cycle training to ten thousand pupils who attend rural schools.

Although the ZTSB's five-year program has an ambitious goal of a 15 percent accident reduction, the means to attain this goal are limited to the information and training activities of the board's head and local offices. The program covers too few aspects of the whole road safety area to be considered a national road safety program, and mixes national and organizational goals. The program is not to be presented for government approval. Establishing an extensive national road safety program comprising all aspects of road safety, would be an important objective for the ZTSB.

The road safety programs: status of implementation

Benin and Côte d'Ivoire are trying to establish financing for their road safety programs. Even if the road safety program of Côte d'Ivoire was completed in 1989, the implementation is still waiting for funding. Negotiations with the World Bank about the Transport Sector Plan, of which the program is a part, are now in process.

Kenya is the only one of the five countries in this project to have implemented a road safety program. During the Kenya road safety program several measures were implemented. When the assistance from Finland ended in 1991, the National Road safety Council came up with a Cabinet memorandum suggesting a new road safety program for Kenya (Finnida 1992, Appendix 6). This program was still waiting for Cabinet approval in early 1997. Several activities established under the 1980 road safety program seem to have ceased after the end of the Finish assistance.

In Tanzania the road safety program is still waiting for Cabinet approval. The Cabinet cannot approve the program until it is presented to them, and the Cabinet paper on the program is waiting for comments from the National Road

Safety Council, which has not yet presented the program for discussion. Why such an important matter as a national road safety program has not been discussed in the Road safety Council more than half a year after it was ready is difficult to understand. It may be that some of the proposals in the program are controversial, and, consequently, the program is being held to avoid realizing these proposals.

The Zimbabwe Traffic Safety Board is implementing its own five-year program, but limited resources pose a severe problem for implementation.

Short-term and long-term effects of the road safety program

It is always difficult to assess the effects of a road safety program because, in practice it is impossible to know what the number of accidents and casualties would have been without the program. As the number of motor vehicles or the number of km driven increases rapidly, an extremely effective program is needed to reduce accidents and casualties. And, if the program is effective, a reduction in the accident rate — i.e., fatalities or injuries to the number of vehicles or to the number of km driven — should be expected. The rate of fatalities to 10,000 motor vehicles was not reduced considerably during the Kenya road safety program. However, the fatality rate of the years right before the program started (1970–80) has not been reached again. (Gekonge 1996, Table 1.3) The number of accidents per million vehicle km was reduced from 2.55 to 1.13 from 1983 to 1990, a possible effect of the program.

On the other hand, when the road safety program includes the improvement of the accident data system, there is a risk that improvement of this system will lead to more accidents being recorded, a fact which may easily be misinterpreted as a real increase in accidents.

A possible way of measuring the effects of road safety activities is through changes in road user behavior, such as lower speed or less drinking and driving. The countries in this project have no such data. A road safety research program could produce driver behavior data.

In Zimbabwe, however, the traffic police officer interviewed claimed that drivers have recently started warning each other about speed checks by flashing their headlights, an indication that the drivers now see a real risk of being stopped by the police for speeding.

Zimbabwe has a lower rate of fatalities to the number of motor vehicles than the other East African countries in the project. It seems likely that the relatively favorable road safety situation of Zimbabwe is due to their road safety work being better organized and, possibly, a longer tradition of road safety work.

Because road accident statistics are not reliable, and no countermeasures have been evaluated, it is almost impossible to say whether the differences in fatality or injury rates are due to differences in road safety efforts or other factors.

Financing and foreign assistance

In most of the countries the road safety activities are financed through government grants. This financing is inadequate in all the countries, especially for the activities outside road construction and maintenance. The paradox is that the road safety activities outside the road engineering sector are much less expensive than those within engineering. In Benin the road safety work is partly financed by vehicle inspection fees, covering more than the costs of vehicle inspection itself. But Benin is still looking for international assistance to finance road safety initiatives.

Norway was supposed to support the road safety program in Tanzania. Some donor financing was planned, but user fees were proposed both to support the regular road safety activities and to become the long-term financing. The user fees in question are levies on third party insurance premium, an annual road safety levy paid by vehicles owners, fees for vehicle inspection, driving schools, driver licensees, etc., as well as a proportion of the roads fund and a proportion of the road offense fines. An amendment to the Road Traffic Act has been presented to the Cabinet, stating that the fuel levy is only used for road purposes.

In Tanzania there is a roads fund, financed by a levy on fuel, securing an increase in the fund proportional to the increase in traffic. A percentage of the roads fund could be used for road safety work as well, even that part of the road safety work not related to road building and maintenance: these parts of road safety work are inexpensive compared to road construction and maintenance. Licensing and vehicle inspection can be financed by user charges to the license candidates and the car owners.

In Zimbabwe there is not yet a dedicated road fund. The revenue from the fuel levy goes directly to government. The annual revenue from the fuel levy is \$US20 million. A dedicated road fund is proposed, and there is also a fee on vehicle licensing that could be used for road safety.

Amount and type of foreign assistance received

The foreign assistance for road safety work varies between countries.

BENIN

There has been limited international assistance in road safety in Benin. In 1986, at the inception of CNSR, the World Bank assisted in purchasing equipment and other infrastructure linked to the vehicle control function.

The cost of this program was about 60 million FCFA (at that time 1,2 million FF) of which 35 million FCFA (0,7 million FF) for equipment. The World Bank's exact contribution is not known, but it was largely limited to purchase of and training in use of equipment. The government thought the assistance was positive because it made the creation of CNSR possible.

In 1996 World Bank support was mainly to purchase equipment for vehicle control. Now, outdated and damaged equipment must be replaced. The team visited the control posts in Cotonou and Bohicon. In Cotonou the control is functioning and equipment is available. In Bohicon only the car headlights were controlled, the only equipment existing at the station. The problem seems to be training and motivation of the staff. A number of controls could have been performed without sophisticated equipment and facilities.

CÔTE D'IVOIRE

Until now, international assistance to road safety activities has consisted of a gift from the Japanese Government of audio-visual equipment to OSER in 1993, as well as engaging consultants for studies.

A Road safety Program was prepared in the National Transport Plan (1989), financed by the World Bank under the Structural Adjustment Program. A French institute was charged with the task. The cost of this work amounted to USD 30.000–40.000. The present OSER reorganization study will cost USD 30.000.

KENYA

From 1979 through 1991 Finland supported a road safety program. This was supposedly the first road safety program in Africa receiving foreign assistance. The fifth phase of the program, covering the years 1989–91, totaled the amounts of 5.5 million FIM (approximately 1 million \$US) and 3.56 million KES (US\$ 0.7 million [(Finnida 1992)]).

The five phases of the program were:

- I. 1979–80** Preparatory phase, including a seminar in Kenya
- II. 1980–81** Preparing a program of countermeasures
- III. 1981–85** Start of the implementation of the program with Finnish technical assistance
- IV. 1986–88** Practical training and documentation
- V. 1988–91** Strengthening sectors which still required progress, black spot reduction, and further practical training.

The program, published in 1980, comprised all major fields of road safety work (Republic of Kenya, 1980). One Finnish project manager was based in Kenya, and four short-term Finnish experts were involved in the program.

The fifth phase of Kenya road safety program, 1989–91, received approximately US\$ 1 million from Finland, and Kenya financed about 100,000 US\$.

TANZANIA

The road safety cooperation between Tanzania and Norway started in 1993. By July 1996 a proposal for a National Road safety program was finished. Written by a group of local consultants, the proposal covered all aspects of road safety. Cabinet approval of the road safety program is a condition for further road safety action. However, further works in the fields of axle load control and establishing the accident data system have proceeded without waiting for the approval of the program.

The assistance from Norway was handled through the Ministry of Works. Considerable problems have arisen in documenting the money first donated from Norway for local purposes in the road sector program. These problems, which are often encountered in international assistance, have delayed the transfer of money from NORAD to local

funds for several years. Accounting and auditing have not been done properly or in time, and Norway considered closing down the road program, of which the road safety program is a part. The World Bank has also refused to replenish local funds for the same reasons with the consequence that breathalyzers for the police were not purchased. But the World Bank representative is optimistic about solving the accounting problems.

ZIMBABWE

Zimbabwe has received some foreign assistance for vehicle inspection and for police activities. These assistance projects have ceased.

There is foreign assistance in road construction, from Sweden, Kuwait, the African Development Bank, ADB, and from the World Bank for maintenance. Some projects are finished, and some new are started. There has not been much interest in road safety from the donors, but there is a new trend to include environment and safety.

Getting detailed quantified information on the financial resources involved in the foreign assistance seems difficult because the people involved — both donors and recipients — change frequently.

Training of national counterparts and road safety officers

The 1985 evaluation of the road safety program in Kenya said that training national counterparts is a “fundamental objective of any aid funded project in a developing country” (Ministry for Foreign Affairs, 1985, p. 48). It also says: “An area of glaring deficiency deserving strong criticism in the existing safety programme has been that virtually no effort has been put into training local counterpart staff to take over... Consequently, the evaluation team would recommend that an extension period of two years be considered... During this period the consultants should be specifically required to complete the training of the local engineers and produce working manuals etc. as required in order to be able to have a locally staffed RSU and Secretariat function by the end of the two year period.” (ibid. p. 49).

The road safety program in Tanzania, supported by Norway, emphasizes the training of counterparts. “The assistance is to take the form of advisory role to the national officers responsible for various programme components. All parties are to strive for effective technology transfer in the shortest possible time. Study tours for the national staff to countries with experi-

ence in road safety programmes should be integrated into their on the job training programmes.” (The United Republic of Tanzania, 1996 p. 97). However, the training of counterparts planned for this program emphasized technical know-how and expertise. The problems encountered so far seem to indicate that management training is necessary as well. In the continued program the training of management skills is likely to be even more emphasized.

In Zimbabwe some police officers and vehicle inspectors have received training overseas. In Zimbabwe the training of traffic police officers was organized about fifteen years ago, using US traffic police officers as lecturers.

Status after foreign experts have left

In Kenya, the road safety work “died a natural death after the Finnish support was concluded,” according to one respondent. Whether “natural” or not, most of the road safety work started during the road safety program of the 1980s has more or less ceased. The problem seems to be a combination of lack of resources, financial as well as human, and lack of political priority. The final evaluation report on the program (Finnida, 1982, page 25) concludes: “The next big step in order to improve road safety situation in Kenya is the change in the views of decision-makers to accept road safety as a priority in order to stop the unnecessary waste of life on Kenyan roads.. Maybe the most important factor in successive [Here is probably meant successful] road safety work is that it has the support of the decision-makers. Without this support it can be impossible to implement some of the most effective road safety countermeasures.”

In Zimbabwe the training of vehicle inspectors and police officers seems to have some lasting effect. In the other three countries it is too early to say what will happen after the experts have left.

Strengths and weaknesses in road safety work

Strengths

The legislation needed for road safety work exists in the five countries. The basic knowledge about effective road safety measures is also there among most people working within road safety. These people are also aware of the scope of the problem.

The basic elements of road safety work, such as accident recording systems, road engineering, publicity, driver training and testing, enforcement, vehicle inspection, traffic education of school children, emergency medical services, and road safety research, exist in all countries. All five countries also have a national road safety council; this means that the organizational basis also exists.

Of the activities mentioned, road engineering seems to be best organized. Even if the road safety aspects of these activities are not always given a high priority, there is a good basis for improvement in this field.

All countries have some sort of road safety programs or plans, though at different stages of realization. The possible exception may be Zimbabwe, where the Zimbabwe Traffic Safety Board has a plan with an ambitious national goal, but the means to attain it are the board's own activities which are far too limited. On the other hand, Zimbabwe is the most advanced country in implementation of road safety work, and therefore the country least in need of an extensive plan.

Weaknesses

IMPLEMENTATION. The implementation of road safety measures is a great problem in all five countries with the possible exception of Zimbabwe. The implementation problems are caused by a number of factors.

Lack of political concern, interest and priority. It takes resources to solve the road accident problems, and the authorities must be willing to put time, money and effort into solving the problem. The main problem seems to be the lack of political concern, interest and priority. It is, however, almost a truism that when road safety measures are not implemented, other priorities are stronger. "The lack of support by politicians and officials in some African countries is jeopardizing the attempts of scientists to promote traffic safety effectively," state Pretorius and Mulder (1997) in their paper "An Integrated Approach Towards Traffic Safety Management, Development And Implementation," presented at the Third African Road safety Congress.

The low priority may be due to a lack of understanding of the scope and severity of the road accident problem among high level politicians. This problem is probably

greater within the ministries not directly responsible for road safety, but responsible for matters conflicting with important road safety measures, like financial and legislative matters.

However, it should be remembered that road accidents are not the only problem in these countries. A number of other problems like unemployment, poverty, crime, AIDS, and other diseases, and a lack of education are all competing for scarce funding and political attention. Even if road accident countermeasures are potentially profitable, action in other sectors of society may be even more profitable.

Feedback to decision-makers. One reason for the lack of political concern is the poor feedback to decision-makers. Although the five countries have accident recording systems, the compilation and dissemination of road accident statistics are slow and poor. More detailed information on accident costs, effects of accident countermeasures, potential for accident reduction and economic savings, and implementation of countermeasures is almost non-existent or, if it does exist, not easily available.

The value of life. Some respondents claimed that Africans place a lower value on life because so many in Africa have faced war, famine, and fatal diseases. What is a few people killed in a road accident if you have seen hundreds die in battle or in a massacre? If this is true then creating concern about road accidents will take some time.

Funding. All but one country have problems with financing road safety work. If a lack of understanding is the cause, it is likely to be in the Ministry of Finance rather than in the Ministry of Transport or Public Works. The Ministry of Finance sets the limits of grants to each ministry, but is not in touch with the road accident problem.

CORRUPTION. Corruption is a widespread problem that also affects road safety. Nothing much is possible in a corrupt system, and corruption is difficult to root out — especially with poor management. Corruption and poor management are generally social problems rather than road safety problems. The first step towards solving these problems is to recognize that they exist.

Frustration. When people working in road safety find that the necessary measures are not implemented, that funding is not provided, or that amendments to the Road Traffic Act are not enacted, they can become frustrated and lose interest, even if they started out enthusiastic. As one of the interviewees said: “It is very frustrating to know what to do, but not having the resources required to do so.”

The belief in education and information. The belief in the effect of education and information alone may be somewhat exaggerated compared to what international road safety research literature can tell about the effects of these measures. According to several respondents, Kenya is trying to improve road safety by “voluntary compliance” with road traffic rules. The achievement of a reasonable degree of compliance on a purely voluntary basis would be unique. On the other hand, when even the civil servants working in road safety are not sure about the blood alcohol concentration limits or what the legal speed limits are, more information and education are clearly needed.

The political power of the Road Safety Council. The road safety councils or boards in all five countries seem to have weak political positions. Some countries have proposed organizational changes to reinforce the council, but these amendments are difficult to enact.

Sustainable Reduction of Road Accidents

The direct causes of road accidents are the same in Africa as anywhere else — namely, the strong physical forces of motorized traffic are not adequately controlled. Thus, when Africa has higher road accident/vehicle rates than other parts of the world, why are the physical forces of motorized traffic more poorly controlled in Africa than elsewhere? In North America and Western Europe the potential growth in road accidents caused by the increase in motor vehicles, has been counterbalanced by effective road safety programs implementing a number of road accident countermeasures; but most African countries have not yet been able to do so.

There is a chain of causes from the inadequately controlled forces bringing about each accident to the institutional, political, economic, and social reasons behind this inadequacy. Figure 1 shows two levels of causation, the accident level and the societal level. For each single accident one factor or a combination of factors may be established as a cause. These causes or factors usually pertain to the road, the vehicle, or the road user.

Road factors

Even if the African road network is expanding fast, and even if the maintenance standard has started improving lately, there is still potential for improving the safety standards of the roads — e.g., designing junctions, installing guardrails, making space and crossing for pedestrians, road lighting, etc. Although road factors are rarely judged to be the main accident cause (because road users are supposed to adjust their behavior to the road conditions), improved road safety standards often reduce the risk of road accidents. As pointed out earlier, road construction and maintenance are working relatively well, but most countries do not accord high priority to safety in this field..

Vehicle factors

To ensure roadworthiness of motor vehicles, standards for newly imported or produced vehicles — as well as technical standards for vehicles in use — are required. In poor countries safety standards may be compromised because safety equipment, spare parts, and maintenance work cost money. A country that does not set and enforce vehicle standards is likely to get vehicles imported that cannot be sold in countries with higher standards. As mentioned earlier, public service vehicles are important to road safety in most African countries. Their roadworthiness seems to leave a lot to be desired, such as protection of passengers in case of an accident, maintenance of brakes, steering and tires, and control of maximum speed.

Human factors

Human factors are often the most important road accident cause. Driving too fast, driving under the influence of drugs or alcohol, other reckless driving, inattention to other road users, overloading vehicles with goods and people, and driving for too many hours undoubtedly contribute significantly to road accidents.

Whether road, vehicle, or human factors — or a combination — are the main causes of road accidents is a matter of judgment. But whatever the main cause is, there is no simple relation between the cause and the countermeasure as discussed below.

Accident problems important to Africa

The pedestrians and the public service vehicle passengers make up 70–80 percent of fatalities and injuries on the road in these countries, as described in Chapter 2. Measures should be taken to protect these road user groups first. But such measures are poorly developed in motorized countries, and those that are developed may not work the same way in Africa. Implementation of known mea-

asures against these accidents, including a thorough evaluation that could indicate further improvement, as well as a research program on the accident situation of these road users and possible countermeasures, are needed.

Protecting public transport passengers

The public transport operators and drivers are limited groups to which special attention should be paid. If not already there, requirements should be made about the driver's age, training, blood alcohol content, and hours of driving, as well as to the organization of public transport. The requirements should be enforced, and fines should be high enough to counter the profit made from overloading and maximizing the number of trips. However, the economic incentives making unsafe and illegal public transport profitable should be examined and possibly changed.

More frequent regular inspection of the public service vehicles, as well as random roadside inspection to avoid special spare parts being used for inspection only, may also help. Construction requirements for public service vehicles to protect passengers in case of accident should also be made. If several countries establish the same requirements, the manufacturers would be more likely to comply.

Tanzania introduced mandatory speed governors or speed delimiters for public service vehicles in March 1997. The long-term effect of this measure should be monitored. Zimbabwe failed at the same measure because the speed governors are too easily manipulated. Better speed governors could be developed or only vehicles with a certain maximum speed should be approved of as PSVs. The European Union has recently introduced a requirement for speed delimiters for heavy vehicles. If this is effective in reducing speed, the European standard for speed delimiters could be adopted.

The public transport is organized and operated differently in Africa than in Europe or North America. Knowledge about how to reduce these accidents is therefore not easily available, and needs to be developed.

Protecting pedestrians

The pedestrian accident problems in Kenya are described by Khayesi (1997) in a paper called "Walking to Injury and Death," presented at the Third African Road safety Congress and by ECA (1997).

Industrialized countries have also made pedestrian safety a low priority compared to drivers and passengers of private cars. Consequently, the knowledge of how to reduce pedestrian accidents is limited. Moreover, protecting pedestrians from road accidents is more complex than protecting most other road user groups. Mandatory training, enforcement or physical protection of the pedestrians can only be applied to a very limited degree. Reducing pedestrian accidents can mainly be done through countermeasures directed at the drivers, such as speed control, speed calming devices, and raised pedestrian crossings. Reflective tags for the pedestrians have the potential for reducing pedestrian accidents during darkness. Trinca et al. (1988) point out the need for developing pro-pedestrian vehicle exteriors to reduce pedestrian accidents in developing countries. Africa's pedestrians may also face a different situation than those in industrialized countries. Street vendors often occupy sidewalks in urban areas, and drivers do not respect the rights of pedestrians.

There is no single measure that can considerably reduce pedestrian accidents. A project on child and pedestrian safety in Cairo and Nairobi (ECA, 1997) proposed policies and measures for improving the traffic safety for these groups, in terms of a comprehensive road safety program including twelve main fields of action and more than eighty specific countermeasures. Based on this proposal a shorter list of high priority countermeasures for implementation and evaluation could be the next step towards improved pedestrian safety in Africa.

Knowledge of countermeasures

With the exception of accidents particular to Africa, there is a wealth of knowledge on how to improve road safety, on the road accident countermeasures. The Tanzania Road safety Programme (United Republic of Tanzania, 1996) details such countermeasures. Ross et al (1991) describe the countermeasures pertaining to roads. The newly revised, forthcoming *Norwegian Road safety Handbook* (Elvik, Mysen and Vaa, 1997) lists more than 100 countermeasures pertaining to roads, the vehicle, and the road user. Jacobs and Baguley (1995) outline a strategy for improving road safety in developing countries in five categories: engineering and planning, vehicle safety, education and training, and enforcement. In their book, *Reducing Traffic Injury — a*

Table 12. Accident causes and counteractions

Level	Causes	Action
Accident	Road user behavior Road standard Vehicle standard	Road action countermeasures
Societal	- Amount of traffic - Lack of implementation - Lack of political concern and priority - Corruption - Lack of funding and other resources	- Action to improve implementation - Action to increase political priority

Global Challenge, Trinca et al (1988) describe five categories of action: exposure control, crash prevention, behavior modification, injury control, and post-injury management.

The countermeasures described in the road safety literature are mostly developed in the motorized parts of the world, and their effects have been studied there. Consequently, these measures may not be optimal for African road accident problems, or their effects may not be the same in Africa. To the extent that African road accidents are different from those of developed countries, this is true. Countermeasures to reduce public transport and pedestrian accidents need to be developed. On the other hand, there is reason to believe that countermeasures such as speed control, vehicle inspection, and elevated pedestrian crossings can be effective in reducing these accidents as well. Although developing and evaluating countermeasures for accidents particular to Africa should not be neglected, there is no doubt that the main problem in Africa is implementation of accident countermeasures rather than conventional road accident countermeasures are not working.

However, with the exception of a chapter on the historical overview of the development of road safety institutions in Trinca et al., the authors do not describe what needs to be done on the societal level, where a lack of implementation rather than lack of possible countermeasures is the problem. This is a problem of management rather than road

safety, and parts of it pertain not only to road safety but to many sectors of African society as well.

Pretorius and Mulder (1997) propose "An integrated approach towards traffic safety management, development and implementation," integrating the road safety action and the management action. They recommend development of implementation plans and continuous evaluation of the implementation process and operations.

Requirements for a sustainable reduction of road accidents

To reduce road accidents during times of motor traffic or motor vehicle growth, effective road accident countermeasures have to be implemented at a rate counterbalancing the potential growth in road accidents caused by the increased road traffic. The easiest way to provide such counteraction in countries with scarce human and economic resources might be to provide expatriate know-how and international funding. This solution, however, raises at least two problems. First, it would mean foreign management of a whole sector, which is contrary to principles of national independence. Second, as the experience of the Kenya road safety program has shown, there would be a great risk that the road safety work would collapse after the withdrawal of expatriate know-how and funding. The key question in road safety in Africa is therefore: how can efforts and achievements be sustained after assistance disappears?

There are several conditions for sustainable road safety work:

- Competence
- Political priority
- Funding
- Implementation
- Organization
- Monitoring and evaluation
- Time.

Time

Even in North America and Western Europe the implementation of road safety measures has taken time. The seat belt was developed in the 1940s and 1950s (Trinca et al. 1988), but was not mandatory in front seats until the 1970s, and in rear seats not until the 1980s in Scandinavia.

More knowledge of effective countermeasures exists now than 30 to 50 years ago, when Western Europe and North America faced road safety problems similar to those in Africa in the 1990s. But the implementing of road safety measures may take more time in Africa than elsewhere. Economic resources are scarcer, and a number of claims compete for these resources. In addition, because education is on the average lower, and widespread motorization is just beginning, there is no option but to wait. Training, reorganization, and creating political concern all take time.

The Botswana road safety program may be an example of how much time it takes to establish, implement, and see the results of effective road safety action. The discussions about assistance in this field started in 1983. The first implementation started in October 1985 and continued until June 1995. The fatality per vehicle rate reached a peak of 42.12 in 1989, and was reduced to 32.58 in 1994. The fatalities/population rate increased until 1993 then decreased for the first time in 1994 (Svensson, 1997).

Competence

Knowledge about effective road safety measures is essential for reducing road accidents. For the reduction to be sustainable, the people who work permanently in the road safety field must be nationals. Some of these already have the required knowledge and skills, and others will need training. The ministries responsible for road safety seem to have highly qualified staffs, and some of them have current knowledge on road safety work. A high turnover among the civil servants in this field is a problem; but road safety training seems to be provided easily.

Management skills may be a greater problem. The evaluation of the Kenya program pointed out the training of counterparts as a key issue. In the new road sector program that NORAD is trying to set up in Tanzania, management training will be included. But providing management skills is likely to be more difficult than providing the road

safety competence; efficient management depends on the whole organization, rather than the skills of a few people.

Training in how to solve conflicting interests may help speed up implementation of road safety measures.

Implementation of road accident countermeasures

Why is implementation of countermeasures more difficult in Africa? One answer is scarce resources — economic and human. Another reason is the early stage of motorization in Africa, which is quite similar to early stages of motorization in other parts of the world. Some of the implementation problems are particular to the road safety area, and some are more general.

Problems in implementation special to road safety

Trinca et alia (1988) describe a set of factors which operated during the early years of motorization in the motorized countries. Some of these seem relevant for the present African situation:

- a) the incorrect conception that crashes were caused by deficient or reprehensible behavior; therefore, the solutions must lie chiefly in behavioral change;
- b) the dominance of the “behavioral cause–behavioral cure” view meant that the road, traffic and vehicle engineering professions and institutions were slow to accept accountability for the traffic safety impact of their activities;
- c) little coordination among road construction, traffic management, law enforcement, public health, post-crash management, and public health agencies, primarily because no one believed that the problem required an integrated, system-wide approach.

According to Trinca et al., these problems preceded a “mature” approach to traffic safety, built on rationality, limited objectives, systems approach, cost effectiveness, and pilot testing and evaluation.

Since research on accident costs is not carried out in these countries, the full costs of road accidents are unknown. Although road accident statistics are compiled, and the media report on road accidents and fatalities every day, politicians know neither the full scope of the problem nor

what can be gained from implementing countermeasures. During periods of high motor vehicle growth, almost any road safety action may seem futile because the total number of road accidents will likely increase for several years after the implementation of countermeasures.

Finding measures that do not cause political problems in implementation may be a challenge. Road engineering measures are usually not politically controversial, with the possible exception of their cost. This may explain why these measures are better implemented than others.

General implementation problems

The problems described — conflicts between ministries, funding, inefficient civil services, corruption, etc. — are management, economic, and social problems, *not* road safety problems. And other sectors in developing countries face similar problems. The knowledge of how to solve these problems seems to be considerably less developed than the knowledge on road accident countermeasures (OECD, 1997); but the basic problem is the lack of political concern and priority. Supposedly, with political concern, the other problems can be solved, at least to some degree. The basic questions then are: why is there no political concern for road safety and how can this concern be created?

Organization of road safety work

Efficient organization of the road safety work, especially in the civil service, is essential for implementing accident countermeasures.

Corruption is a problem in these countries. One condition for abolishing corruption is to increase salaries of civil servants enough to allow them to make a living from their legal income. A higher salary may also encourage civil servants who are not in a position to accept bribes to work more efficiently.

Because road safety is now a minor field with limited possibilities for making a career, the turnover of civil servants is often high. This means that new civil servants will have to be trained in road safety aspects often. Making better career possibilities within the road safety field could increase competence and reduce the need for training.

Cooperation with other sectors facing similar problems may help — for example, management training seminars and cooperation with expatriates trained in civil service.

Transparency and accountability in government management are principles being tried out in other sectors, as are incentives for good results. Parts of the road safety work, like vehicle inspection, could be privatized, as it is in Côte d'Ivoire. Better-paid civil servants may also help. Management training has already been mentioned as being at least as important as road safety training.

Organizing the road safety policy and work according to the “integrated approach towards traffic safety management, development, and implementation” (Pretorius and Mulder, 1997) might be worth trying.

Monitoring, evaluation, dissemination and research

As pointed out by Pretorius and Mulder (1997), evaluation is necessary at all steps of a road safety policy or program in order to ensure correct implementation and necessary adjustments. In the new road safety policy of the European Union, monitoring and evaluation is the first of the three high priority areas (Preston G, 1997). The monitoring and evaluation must include a system for collecting and analyzing road accident data to follow the accident trends. Since these systems are established in all five countries included in this project, they will not be discussed in detail. But there are indications that some accidents go unreported, and that the statistics compiled are not always reliable. Consequently, continuous monitoring and improvement of the accident data systems are required.

Accident trends cannot be expected to decrease quickly during times of increasing road traffic; and the implementation of the first few countermeasures cannot be expected to have an impact on the total number of accidents. To ensure that accident reduction will eventually be attained, the implementation of accident countermeasures must also be monitored and reported to authorities. In addition, the accident reducing effect of the countermeasures implemented must be evaluated to make sure that they are worth the cost. The effects should also be reported back to the authorities as well as to the road users to improve attitudes towards road safety action. The evaluation of measures implemented will help develop measures to solve parts of the road accident problem particular to Africa.

Evaluation is necessary to see if a road safety activity has been effective. This evaluation of the results must be carried out according to standard social science methods

Speed delimiters for public service vehicles were recently introduced in Tanzania to reduce the number of accidents involving these vehicles. The public transport industry is strongly opposed to these delimiters. Therefore, are the delimiters reducing accidents enough to: (a) be worth the opposition from this industry; and (b) support the enforcement and inspection needed to maintain the delimiters? Preferably, a countermeasure such as this should be introduced on an experimental basis in some parts of the country first to see whether accidents are reduced. If the

reduction is significant in those areas, then countermeasures can be implemented for the whole country.

But what if there is no difference, or there are more accidents in the districts with the countermeasure than in those without? Before drawing any conclusions, the activities carried out must be studied in detail: Were the speed delimiters really installed? Did the transport operators or drivers manipulate the delimiters? Do they drive faster in built-up areas to catch up for the extra time spent driving more slowly outside built-up areas?

— i.e., before-and-after studies with control groups, so that the effect can be established and attributed to the activity in question. There is also a need for process evaluation. If there is no effect, the question always arises: why? The process from the initial decision made to the implementation of all details needed must be investigated to see which element or elements in the process did not work (see box).

Some parts of the road accident problems are unique to Africa, such as the heavy accident burden put on pedestrian and passengers in public service vehicles. Though speed humps are installed in several African cities, the effect on pedestrian accidents in the local area is usually not known. Pedestrian accidents and the effect of possible countermeasures will require research; and the research and evaluation should consequently include studies on the problems of implementing road accident countermeasures in addition to the accident reducing effect they may have once established.

Though some estimates of road accident costs exist for Africa, these estimates are often general, superficial, and outdated. More detailed, updated national cost estimates may help promote road safety. Even if the value of human life may lose value in countries with high unemployment, estimates of the health care costs or the health resources spent on road accident victims might convince politicians to focus on road safety. The same thing goes for cost-benefit analyses of accident countermeasures, showing that some road accident countermeasures can be profitable. In only three years—and excluding the human value—the Botswana road safety program saved in accident costs more than three times the money invested (Svensson 1997).

All road safety programs should include evaluations of the program activities. Even if the activities proposed have well documented, accident-reducing effects, the effects may be different in a different setting. If evaluation is not included, knowledge on how to improve road safety will not accumulate. Evaluation projects are costly, but carrying out road safety activities, which have no effect on road accidents, are even more costly.

Monitoring and evaluation will improve the competence of the people working within road safety. Over the long term, monitoring and evaluation work could develop into competence centers for road safety and road safety research. The dissemination of monitoring and evaluation results to decision-makers and the public at large should be emphasized.

The African road safety congresses have shown that the road accident problems are similar in most parts of Africa. An African road safety research program could help establish research, and help disseminate the results throughout Africa. Evaluation and research should be carried out by institutions independent of those responsible for the road safety activities. All five countries have competent universities or other research institutions that can carry out evaluation projects and other road safety research. They might do this with assistance from international experts or by “twinning” arrangements with overseas road safety organizations, e.g. TRL (UK), SWOV (the Netherlands), TØI (Norway), INRETS (France) or VTI (Sweden).

Strengthening political commitment

The primary requirement for a sustainable reduction of the accident rate is that road safety is made a political priority.

The conclusion of the evaluation of the Kenya/Finland Road safety Project, 5th Phase (Finnida 1992, p.25) puts it this way: “Maybe the most important factor in successful road safety work is that it has the support of the decision-makers. Without this support it may be impossible to implement the most effective road safety countermeasures.”

Reasons for lack of political commitment

As Chapter 2 points out, road accidents are not yet a great public health problem. Most African countries face severe problems in many sectors of society and a general shortage of resources to solve these problems. Even the expected increase in road accidents may not get the political attention required when other sectors have severe problems today. Within the transport sector, the political attention is focused more on solving the transport problems rather than on the accident problem.

Unless accident numbers are extremely high, road safety action is not in great demand because most people think that road accidents only happen to people who behave recklessly. Politicians need support from the people. But the lack of demand for road safety action, combined with strong opposition from pressure groups against restrictions, makes it difficult for politicians to act. NGOs have a part to play in convincing people and politicians that better road safety is both needed and possible.

Another reason may be that the real costs of road accidents and the potential benefits from countermeasures are not well known. When an unknown number of accidents goes unreported and the cost of each accident is not known, there is no way the politicians can know the total loss.

A third reason may be the “behavioral cause-behavioral cure” view mentioned in Chapter 4, which may make decision-makers think that information and education will solve road safety problems. A high-ranking civil servant in Kenya stated that the present policy was to solve the road accident problem by “voluntary compliance.”

Possible actions

Political priority can only exist when both the population and the politicians are convinced that road safety mea-

asures give more benefits than they cost. The question then is: how to create such beliefs? Awareness campaigns may be the answer—but only if they emphasize both the human suffering and economic consequences, and that road accidents can be avoided by implementing effective countermeasures. Awareness raising should also mention the negative effects of traffic safety measure, such as restricting speed choice or extra costs; but it should also stress that, especially in terms of human life, these measures are worth the benefits. The means to reduce the number of road accidents considerably are there, and we can apply them if we want to. Awareness campaigns directed at decision-makers should preferably be based on cost-benefit analyses, showing that road safety profits society. Awareness campaigns directed at the people should emphasize that road accidents can be reduced considerably if effective countermeasures are implemented.

Considering the experience from Kenya, it seems worthwhile to involve top politicians or other people held in high public esteem — e.g. tribal leaders and academics — in the road safety programs. However, top politicians change in all countries. Even if the commitment of one or more politicians has been obtained, nobody knows who will head road safety in the years to come. On the other hand, if the politicians committed to road safety only move to other political fields, they may provide an alliance for strengthening the road safety priorities.

As the number of motor vehicles increases, motor insurance is a growing market. Some countries already have compulsory third-party insurance; although the number of car owners that carry this insurance may vary. Insurance companies could see a market for more insurance, if third party insurance is made compulsory in all countries and there is a better control of insurance.

The national health institutions may help raise political concerns for road safety. The ministries of health carry a large share of the costs for road accidents, and caring for road accident victims takes a large share of the hospital costs. The ministries of health would therefore gain from the implementation of effective road safety measures; whereas these measures represent costs and work but almost no gain to the ministries responsible for roads and road traffic.

Better knowledge of accident costs, the total loss to society from road accidents, and the benefit and economic gain from countermeasures may encourage more political commitment. If national estimates are unavailable, estimated accident costs for neighboring countries could be used. But, clearly, national figures are more convincing than foreign figures. Countries having no national figures for accident costs and potential economic benefits from countermeasures should have estimates made by local universities and disseminated to politicians and civil servants.

The media and nongovernmental organizations (NGOs) have an important part to play in pointing out the road accident problem and that, to a large degree, these accidents can be prevented.

Making the national traffic safety board more independent of the ministry responsible for road safety may enable the board to put more public pressure on the ministry. Another possibility is to establish an NGO for road safety in addition to the road safety board. Lundebye and Ellevset (1997) describe the role of NGOs in road safety and claim that “governments, even if they do their best, can not manage this challenge [the road accidents] alone and therefore need the support of society, including the NGOs....”

The donor countries have extensive experience in high volumes of road traffic, the consequences of accidents, and countermeasures against accidents. When assistance to the road sector is provided for road construction or maintenance, the donors should try to raise awareness of the dangers of road transport, namely road accidents. This is already done to a certain degree, but the emphasis seems to be more on the measures implemented than on political concerns about the problem. Could donors put more pressure on the local authorities about future consequences unless road safety action is taken? Requiring *sustainable* development of road safety may even be made a condition for any road sector assistance, since any development in the road sector is likely to increase traffic volume and speed and consequently the number of road accidents.

Political concern and priority for road safety can also be improved by regional seminars on road accidents and possible countermeasures in Africa. Cooperating with other countries with similar problems or countries more advanced in the implementation of countermeasures may stimulate the political interest.

Some conspicuous improvement of road safety may be needed to convince road users and politicians that something is being done to reduce road accidents. Consequently, when specific countermeasures are implemented in the first part of a program, this implementation should be part of a concentrated demonstration project, showing the potential of road safety efforts. If an area or road with a high number of accidents is chosen for concentrated road safety efforts, a convincing example of road safety work could be the result. Such results would be of interest to media, to politicians and to road safety people facing similar problems in other countries.

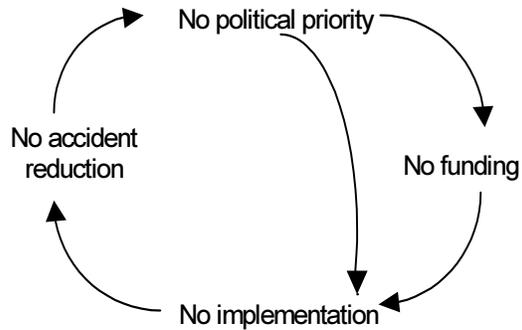
The most important action to improve implementation of road safety measures may be to include the implementation and generation of political concern as part of a road safety program, as is done in the Tanzania Road Safety Programme. This program states that the first strategy is to obtain “a consensus of the proposed organising structure and management from all institutions involved in the implementation” (United Republic of Tanzania, 1997). But the program does not say how this consensus can be achieved. Thus, specifying actions required to attain political priority may be an advantage. The impact of these actions should be monitored as well, since “the implementation phase of the road safety work is overlooked in the road safety research area” (OECD, 1997). As the need for political concern and implementation is hardly unique to the road safety area, the experience of other sectors of society may be valuable.

Sustainable financing

Funding falls short in these countries, and international funding is in great demand. Funding may be provided internationally for a limited time and for special purposes, but the basic funding for road safety activities must be national. The present national funding is through government budgets or grants, but government funding may vary from one year to the next, which may pose great problems for the stability of road safety work. However, user fees based on the road traffic will be stable or even increase as the road traffic increases.

In some countries the Ministry of Finance does not want to earmark public revenue for special purposes. In principle, the parliament should decide upon the spending of

Figure 1. Relations between four high priority requirements to sustained road safety



public revenue, whatever source it comes from. In other countries there is agreement, in principle, to using funds like the fuel levy for road maintenance — although the Ministry of Finance will still spend some of the money for other purposes. It seems reasonable enough that revenue gained from the road users should be spent on road traffic, including reducing such negative consequences as road accidents. Levies on road traffic may be more acceptable to the road users if the revenue is being spent on roads, including road safety measures.

Many respondents see the lack of resources as the main problem: if there were resources for better roads, more enforcement equipment and vehicles, as well as more education and information, then road safety could be improved. However, as pointed out earlier, there is money in motorized traffic, and the potential for funding road safety is there: anyone who can afford a motor vehicle, can also afford a few dollars a year for safety. Lundebye (1997) considers 3-5 US\$ per vehicle per year to be adequate in Sub-Saharan countries. Rather than the resources themselves, the problem is organizing a sustainable system for collecting revenue and ensuring that revenue is spent on road safety. A fee on third party insurance premiums may be the best way to organize this revenue.

The Tanzania Road Safety Programme (United Republic of Tanzania, 1996) proposes a combination of user fees:

- a charge on third party insurance of 2 to 5 percent
- a road safety levy paid annually by vehicle owners

- program fees (a proportion of fees for vehicle inspection, driving schools, driver licenses etc.)
- a proportion of the roads fund (which is based upon a fuel levy)
- a proportion of the related fines.

Lundebye (1997) proposes a similar combination of user fees and government agency funding. Financing based on such user fees could be implemented in any country, and is sustainable because it will increase with the road traffic.

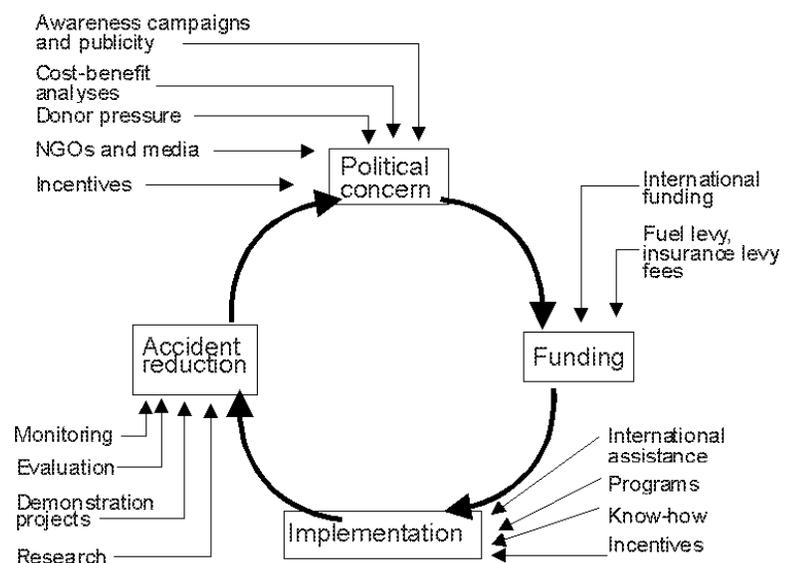
Requirements for improving road safety

Though requirements to sustain the reduction of road accidents are plenty, this project has shown four of the most important in the present situation. They are:

- political concern and priority
- funding
- implementation
- monitoring, evaluation and research

Donors should emphasize these areas in any roads assistance program for Africa as a whole, sub-regions, or single countries.

Figure 2. Main requirements to sustained road safety and ways of fulfilling them



These four requirements are interrelated. In the present situation they constitute a vicious circle, as shown in Figure 1. Because political concern is low, funding is not organized, although the potential exists, and implementation of countermeasures becomes difficult. Consequently, accidents continue to increase as road traffic increases, and politicians will continue to blame the road accidents on irresponsible road user behavior alone.

Outside stimulation for one or more of the above areas could turn the vicious circle into a positive one, as indicated in Figure 2. Increased political concern can bring about the organization of user fees for increased funding, which in turn will make implementation of countermeasures easier. When adequate countermeasures are implemented, the monitoring system will show favorable effects for road safety, and political concern will be further stimulated.

These actions are proposals rather than research-based facts; research in conditions for implementation and creating of political concern is scarce. Action to improve political priority should be included in the road safety program, even emphasized as a high-priority field of action.

Proposed Agenda for an Africa Road Safety Initiative

At the conclusion of the Third African Road Safety Congress in South Africa, April 1997, an African Road Safety Initiative was proposed. The objective of this initiative was to improve the road safety situation in Africa by increasing the awareness of decision-makers, politicians and the public, to increase the motivation and commitment of top-level decision-makers and politicians, and develop better information systems and increased action by international organizations. Such an initiative can use the competence and capacity for road safety work that already exists in several African countries, improving and expanding this capacity in cooperation with international experts.

An African Road safety Initiative would have to be financed by donors, at least in the beginning, but also be based on membership from African countries. If possible, incentives for road safety action should be part of this organization. The head office of the organization should preferably be based in Africa in order to build African road safety competence.

An African road safety initiative like this can contribute to reducing the accident level on African roads to a level similar to that of the already motorized countries.

Road safety — a public interest and a government responsibility

In all countries road safety is primarily a public interest, and cannot easily be brought into the market economy. Even if parts of road safety work can be commercialized and financed by user fees, road safety must remain a government responsibility. This situation is similar to road maintenance, which has also been a great problem for African roads. A Road Maintenance Initiative (RMI) was launched in 1987 to improve road maintenance. To improve the road safety action within the government, the African Road Safety Initiative could be organized according to the

same principles as the RMI (Heggie, 1995), which are user fees and businesslike management based on four “building blocks”:

- *ownership*: involve road users to win public support for more road safety action
- *financing*: secure an adequate and stable flow of funds
- *responsibility*: clarify who is responsible for what
- *management*: introduce sound business practices and strengthen management accountability

Four main areas of action

Chapter 4 describes four main areas for action:

- political priority
- implementation
- funding
- monitoring, evaluation and research.

These areas of action should receive the highest priority in the African Road Safety Initiative — through cooperation between African countries, both regionally and for the whole of Africa, dissemination and awareness seminars, donor pressure and other actions as described in Chapter 4.

An initiative such as this would use the capacity that already exists in Africa for road safety work, but would improve and expand it in cooperation with international experts.

At first, donors would have to finance the initiative, but based on African membership; and incentives for road safety action should be part of this organizations. The head office should be based in Africa in order to build competence in road safety.

An African Road Safety Initiative could help reduce the level of accidents on African roads to the level of accidents in motorized countries.

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