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# *Review of the Road Sector in Customs and Economic Union of Central African States (UDEAC)*

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Africa Region  
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**Review of the Road Sector in  
Customs and Economic Union  
of Central African States (UDEAC)**

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*Final Report*

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## ***ACRONYMS***

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AADT	Annual Average Daily Traffic
ADT	Average Daily Traffic
COMESA	The Common Market for Eastern and Southern Africa
DAC	Development Assistance Committee
DCP	Directorate of Roads and Bridges
DGR	Direction Générale des Routes
DGTP	Direction Générale des Travaux Publics
EC	The European Community
ECOWAS	Economic Community of West African States
GDP	Gross domestic product
HDMIII	Highway Design and Maintenance Standards Model
IDA	International Development Association
ILO	International Labor Organization
MOLG	Ministry of Local Government
MOPWH	Ministry of Public Works and Housing
NCTA	Northern Corridor Transport Agreement
NORAD	Norwegian Agency for Development Co-operation
RMI	Road Maintenance Initiative
SADC	Southern Africa Development Community
SATCC	Southern Africa Transport and Communications Commission
UNCTAD	United Nations Conference on Trade and Development
WB	The World Bank
UDEAC	Union Douanière et Économique de l'Afrique

## ***EXCHANGE RATES***

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	<i>1 US dollar =</i>
<b><i>CFA Franc</i></b> (Cameroon, Central African Republic, Chad, Congo, Gabon, Equatorial Guinea)	580
<b><i>Zaire</i></b> (Democratic Republic of Congo)	50,000
<b><i>DOBRA</i></b> (São Tomé & Príncipe)	2390

Note: As of September 1, 1997.  
Source: Union Bank of Norway, Oslo.

## *ABSTRACT*

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The review presents an overview of the road sector in the seven UDEAC countries and in the Democratic Republic of Congo.<sup>1</sup> It examines the adequacy of the infrastructure services as well as the efforts to improve financing and management and, thus, the sustainability of service and efficiency.

The Central African Republic and Chad are the two truly landlocked countries in the region. However, the Democratic Republic of Congo also faces many of the same problems because of its vast land area and the narrow outlet to the Atlantic Ocean in the west. These countries depend on transit road traffic through neighboring countries, and international through routes become lifelines for import and export. All the countries share similar problems in regard to international trade transport.

In 1997 the eight countries spent about US\$65 million as recurrent costs for maintenance. This expenditure was only about one fourth of the estimated US\$260 million needed to keep the road networks in a stable condition.

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<sup>1</sup> Cameroon, Central African Republic (CAR), Chad, Congo, Democratic Republic of Congo (DRC), Equatorial Guinea, Gabon, São Tomé & Príncipe.

## ***ACKNOWLEDGEMENTS***

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In all the countries, road agencies offered valuable assistance in collecting and assembling statistical data and background information. The findings, conclusions, and recommendations contained in this report are those of the author alone and based on available information.

# EXECUTIVE SUMMARY

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This study of the road sector in the UDEAC region (*Union Douanière et Economique de l'Afrique*)<sup>2</sup>, was carried out in connection with the strategy of the Road Maintenance Initiative (RMI) to make its findings available to all Sub-Saharan African countries. The study's objective was to review the state of the road sector with respect to adequate infrastructure services. UDEAC aims to develop a common market with elimination of import duties and has been promoting policy reforms in the transport and communications sector. It has been concerned about the poor state of the road network in most of the member countries and has taken a great interest in the Road Maintenance Initiative. RMI is financed by a coalition of donors and administered by the Africa Technical Department of the World Bank as one of the components of the Sub-Saharan Africa Transport Program (SSATP).

## 1. The road sector in the UDEAC Region

### General demand

During the past decade, the demand for infrastructure service in the region has stagnated, most likely because of political disturbances and hence poor economic performance. The total vehicle fleet in the region decreased by about 20,000 units to less than 400,000 vehicles. This corresponds to an average vehicle density of 68 vehicles per 10,000 persons. Although there was an average decrease, in some countries in the region, demand grew. For example in Chad, with the lowest vehicle density of 49 vehicles per 10,000 persons, traffic increased heavily in the beginning of the 1990s, with annual growth rates of 25 percent, in step with the improved economy and increased car ownership.

### Demand for better roads and service

One feature of the region is the sparsely populated and vast land areas. Because of weak economies, governments have been unable to expand road networks to serve adequately the most remote rural areas. Improvement of transport infrastructure has been identified as one of the priority actions to reduce poverty in rural areas. For example, a survey carried out in Cameroon found that as much as 86 percent of people interviewed thought that poor transport was the major cause of poverty. Many of the problems of the poor were compounded by the limited or non-existent road infrastructure, which cut off many villages and made some inaccessible for up to four months during the rainy season.

### Landlocked economies and international transport

The Central African Republic and Chad are the two truly landlocked countries in the region. However, the Democratic Republic of Congo also faces many of the same problems, due to the vast land area and the narrow outlet to the Atlantic Ocean in the west. These countries depend on transit road traffic through neighboring countries. International through routes become lifelines for import and export and they all share much the same problems in regard to international trade transport.

In the UDEAC region, road transport is complemented to a larger degree by rail and river transport than in other SSA regions. For example, in the Central African Republic transport on some 2,616

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<sup>2</sup> Cameroon, Central African Republic, Chad, Congo, Democratic Republic of Congo, Equatorial Guinea, Gabon and São Tomé & Príncipe

kilometers of navigable rivers complement road transport. International surface transport is here divided between river transport to Brazzaville (Congo) and from there by rail to Point Noire (1,850 kilometers) and road transport to Douala in Cameroon (1,650 kilometers). Chad has a distance of almost 2,000 kilometers from the sea and vast distances between the urban centers, and the future developments of the economy depends more than usual on an adequate transport capacity and reduced road transport cost. Chad has no railway and the navigability of the waterways has generally been negatively affected by erratic rainfall patterns in recent years.

### **Demand and prioritization of maintenance**

Four of the UDEAC countries—Cameroon, Central African Republic, Chad and Gabon—have taken steps to develop a “priority” road network commensurate with the means available for maintenance. This is both a necessary and important step to improve road management, since the basis for funding road maintenance on a sustainable basis is very weak in most countries in the region. The resources and capacity to repair and maintain all the existing networks, including main roads and rural feeder roads, are clearly not available to most of the countries.

### **Maintenance burden of road users**

Appendix 1 gives an indication of the lengths of roads to be maintained in each country, relative to the size of the population and the ability to pay for infrastructure service. For the region as a whole, the total road network length averages 13 kilometers for every million U.S. dollars of GNP. The length of main roads averages about 4.4 kilometers for every million dollars of GNP, as compared with 3.6 kilometers in ECOWAS. For example, the Central African Republic has about 21 kilometers of road per million GNP, which means that fully adequate maintenance of all roads would require more than five percent of GNP per year. Also, the Democratic Republic of Congo, with 37 kilometers of road to maintain per million GNP, is typical of many SSA countries, with many kilometers of roads per capita, relatively sparsely populated areas, and a low economic capacity per kilometer of road. UDEAC's total maintenance requirement of US dollars 260 million, divided by the number of vehicles in the region (389,978), gives an average of US dollars 667 per unit. Although these figures are uncertain, they demonstrate the unusually high burden on each road user (vehicle owner) in the UDEAC region, because of the low vehicle ownership.

### **Road traffic safety**

The fatality per vehicle rates are high for all countries in the region. About 2,167 persons were killed from road accidents in the region in 1997. Pedestrians and passengers of public service vehicles are probably the main victim group. Within the region, Cameroon has the highest fatality per vehicle rate with about 72 persons killed in road accidents in 1997 per 10,000 vehicles (906 fatalities). Lowest fatality per vehicle rate was recorded in Chad with 20 persons killed in road accidents per 10,000 vehicles (49 persons killed). This is a very low figure compared to most other countries in SSA, and may be due to an underreporting of fatal accidents.

## **2. The road network**

### **Road lengths**

In 1997 the total road length in the UDEAC region comprised about 256,668 kilometers of roads, including 90,148 kilometers of main roads, 135,923 kilometers of rural roads, 2,215 kilometers of urban roads and 17,073 kilometers of farm roads, forest roads, and other roads. The replacement value of the main roads network alone is about US\$6.5 billion, and the required annual expenditure on routine and periodic maintenance of main roads (not included needed rehabilitation) is about \$US243 million.

The length of paved roads in the region increased by about 4 percent annually over the last three decades. From a total length of about 3997 kilometers in 1970, it increased to about 10 588 kilometers in 1997. In contrast, the total paved roads length grew very slowly during the last decade at about 100 kilometers, or one percent per year. The total average coverage of paved roads in the region is also modest, with about 185 kilometers per million persons, which is the lowest of the four regions of SSA.

The coverage of paved roads is about 399 kilometers for ECOWAS, 192 kilometers for the COMESA area, and 592 kilometers in the SADC region (1993)—about 1,335 as an average for “middle-income” economies and more than 10,000 kilometers for “high-income” economies.” Chad has an extremely low coverage of paved roads with only 45 kilometers per million people. In comparison Mali has the lowest density of paved roads in the ECOWAS region with about 284 kilometers per million people, and Ethiopia lowest in the COMESA region with a density of paved roads of only about 66 kilometers per million capita.

### **Road conditions**

Data in Appendix 2 show the changes of average road conditions from 1989 to 1997 for each country. However, these average data for the whole region should be treated with caution. Monitoring of road conditions is not done regularly and is not based on the same set of parameters. For the “main paved” network, the average percentage of “good” changed from 27 in 1989 to 32 in 1997, whereas the percentage of “poor” increased from 31 to 34. These relatively minor estimated changes are well within the margin of error of collected data. That conditions have remained stable is most likely a result of a massive rehabilitation effort in many of the countries, mainly by donor funds, and not the result of regular maintenance. For the “main unpaved” road network of the UDEAC region, the data could indicate a trend of further deterioration. The average percent age of “good” went down from 37 in 1989 to 20 in 1997, and the percentage “poor” increased from 31 to 55 in the same period. This indicates a general downward trend, which is mostly due to inadequate maintenance, but could also be attributed to more traffic and heavier loads on gravel roads now than in the past.

### **Replacement values**

The replacement value of the total main roads network was estimated to be about US\$6.5 billion, using a replacement cost of US\$250,000 per kilometers of paved roads and US\$50,000 for unpaved. (Replacement costs of rural roads are very uncertain because no accurate data exist and in some cases the standard of roads vary from reasonable access roads to non-motorized tracks. However, it would probably add another US\$1 billion to the total). Required funds for routine and periodic maintenance of the main roads would only require about US\$300 million per year. This does not include the cost of necessary rehabilitation, which in some cases amounts to considerable sums of money.

## **3. Road management**

### **Institutional arrangements**

Government departments manage the main roads in all eight countries. The main road agencies are part of the civil service and face the same constraints as other government agencies with inadequate salaries and conditions of service.

### **Urban roads**

In most countries, urban roads are managed by the municipalities, or city councils, such as Libreville, Yaounde, and N'Djamena. National roads that go through urban areas are mostly

managed by the main road agency. But there are exceptions where national roads are maintained by the municipalities within the city boundary.

### **Rural roads**

Rural roads are generally managed by district administrations, although in practice very little maintenance or other road work is done because of a lack of resources. In most countries, district administrations have access to technical advice from the main road agency. Central coordination, both technical and financial, of the rural road development and maintenance, is arranged differently in the countries. In some countries rural roads management is coordinated by a section in the Ministry of Local Government. Some rural roads are also under the responsibility of various agricultural agencies, such as cotton companies, coffee companies or livestock companies. However, limited budget funds have prevented most of the agencies from adhering to regular maintenance programs. Also, rural access roads under the responsibility of a government ministry, such as the Ministry of Rural Development in the Central African Republic, have received practically no funds for maintenance and have become almost inaccessible by cars. Consequently, provision of inputs, collection, and marketing of cash crops and food crops, become difficult and costly due to the high vehicle operating costs.

### **Staffing and salaries**

Employment conditions in road agencies are poor in most UDEAC countries. Road agency staff in all eight countries in the region have salaries well below the private sector. Engineers are typically paid annual salaries from \$US 1,200 to \$US 2,500, as compared to between \$US 5,000 and \$US 15,000 in the private sector. So far, the public sector has been able to attract well qualified personnel; however, this pattern is beginning to break up. The long tradition that young professionals sought a job in the public sector is changing, and the private market is gradually becoming more stable and reliable and thus highly competitive with the public.

## **4. Work execution**

### **Road maintenance activities**

As previously observed in SADC, COMESA and ECOWAS, the UDEAC region has seen a marked change during the last three to five years towards more use of contracts both for routine and periodic maintenance. Private contractors participated in road maintenance in a very limited amount in the first years of the reporting period—i.e., from 1989 to about 1995. Force account brigades received almost all of whatever scarce funds were allocated for maintenance. Private sector contractors were generally blocked to compete for road maintenance work. For example, in Cameroon priority was given to investments, and maintenance of roads was neglected during the last decade. The government was committed to paying salaries of employees and was not able to fund maintenance. Low productivity of maintenance was caused by inefficient management, non performing force account teams to do the jobs, and poor availability of equipment and lack of financing. The maintenance program now proposed for the years up to 2000, has been based on a need of rehabilitation, periodic maintenance, and routine maintenance for the whole road network. For each maintenance intervention there will be a planned progression of participation of private contractors. In Chad, the Office National des Routes (OFNAR) used to be responsible for road maintenance. From 1984 to 1993, the public office went through a process of commercialization and privatization. It was reorganized in 1989 as a public establishment with a legal personality and financial autonomy, under the direction of the parent ministry. With a view to its privatization, the personnel holding was reduced from 1,100 to 600 and restructured in 1993. OFNAR ceased its activities and the Societe National d'Entretien Routier (SNER) was created. In 1995, half of all routine maintenance works were allocated to SNER on a sole source basis, while bids were sought

on the other half, for which SNER could not bid. SNER has already obtained several contracts for periodic maintenance work through competition. The intention is now to open the company's capital to private shareholders.

### **Management contracts**

The change from force account operations to contracting has altered the role of management. Focus is now much more on quality control and supervision, which has had a marked effect on works execution. The quality of work has improved with the need to design and specify all road works and the tighter supervision required for contracts. With the changed roles of road management, some road agencies have realized that they lack the capacity to carry out all the functions required of an effective client. Key client functions would be procurement, cost and quality control, and supervision. Some of the road agencies in UDEAC have therefore adopted a model of contract management of maintenance work used successfully in other West African countries, such as in Mali and Senegal. Part of routine maintenance is typically carried out through works agreements delegated to an *Agency for the Execution of Work of Public Interest for Employment (AGETIPE)*. AGETIPE is contracted by the government on an annual basis to act as a project manager for public works, to procure and manage local contractors who are free to select their own method of execution, whether labor-based or mechanized. Experience shows that a number of tasks have been carried out manually in all contracts, such as clearing of bush, surface repairs, and repair of signs.

### **Equipment management**

In the past, all the countries in the UDEAC region have relied on public plant pools for force account operations, either construction or maintenance. Public plant pools have traditionally been managed directly by the road agency or by a separate department, such as in Gabon. Management of equipment for road works is now changing. Many countries are in the middle of a transition from publicly owned fleets of plant and vehicles to public/private commercial plant pools and private contractors with their own equipment. In the UDEAC region the road agencies in Equatorial Guinea and São Tomé & Príncipe have only skeleton equipment fleets. Chad has no public plant pool. Road agencies in Congo and the Democratic Republic of Congo, which used to have large equipment fleets, have now lost their fleets due to negligence or war operations. In Cameroon, equipment management is now going through a process of change focusing on commercial management and accountability. In Central African Republic the government has committed itself to use the private sector in road management. However, the directorate responsible for management and upkeep of all plant and equipment for force account operations will remain for some time, since there is presently no private equipment pool in the country.

## **5. Financing**

### **Maintenance spending compared with estimated requirements**

In 1997, the eight countries in the region spent a total of about US\$65 million as recurrent costs for maintenance of the road network. The recurrent allocation was thus only about 25 percent of the estimated US\$243 million needed to keep the main road network in a stable condition.<sup>3</sup>

### **Road user charges and cost recovery**

The government collects revenue from road users, partly as general government tax and partly as road user charges, as shown in Appendix 8. The total direct road user fees collected in 1997 in the whole region was about US\$20 million. This was less than one tenth of total maintenance requirement for the region's main roads, US\$243 million. All road user charges collected, including

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<sup>3</sup> See appendix 9

government taxes and duties—that is, any general consumption tax paid by road users—in 1997, totaled about US\$130 million. All eight countries collected far less in total road user charges than estimated maintenance requirements for main roads.

### **Road funds and new initiatives.**

Various designs of Road Funds have been tried in the region for a long time. For example, the present Road Fund in the Central African Republic developed gradually from a "special account" in the 1960s and 1970s, maintained at the Ministry of Finance and funded through the general budget, to the legally and financially autonomous public institution created in 1981. The special account mechanism of the national budget failed to provide timely and adequate financing of road maintenance. A new type of Road Funds, referred to as "second-generation road funds," involving road users in management, has now been established in the Central African Republic and in Chad. In addition, the governments in Cameroon and Gabon are considering the concept. The road agency in Equatorial Guinea has shown an interest in improving road financing through a road maintenance fund, and a French consultant recently carried out a study to consider the financial and management implications.

## **6. Issues.**

### **Enforcement of legal axle load limits**

Overloading of vehicles has been a major problem in many countries in the region. Although, little statistical data exists, heavy axle loads are taking a high toll of the region's roads. Lorries and trailers have axle loads far in excess of the legal limit, and axle loads of more than 20 tons have been recorded. Road agencies operate some weigh-bridges; however, only a token effort in view of the scope of the problem. Overloading now represents a serious threat to the major road network in the region. If allowed to continue, it may cause damage to new roads and to roads that have been rehabilitated at great costs. Regular maintenance may help to extend the life of pavements, but cannot prevent premature pavement failures caused by excessive axle loads. Enforcement of legal axle load limits needs a regional coordination because the responsibility for implementation is not defined in many of the member countries. The agency with the strongest incentive to enforce the regulations is probably the main road agency, but even it may have to back off in the face of the hostility sometimes encountered from politically well connected road transport companies. Road agency success in enforcing axle load limits has demonstrated the merits of telling truckers about their role as major stakeholders and the direct benefits of good roads. Through continuous dialogue with representatives of the transport industry, UDEAC could help win the support of truckers for stricter enforcement of axle load limits.

### **Road user charges**

Direct road user fees collected in 1997 in the region were less than one tenth of the maintenance requirement for main roads. All eight UDEAC countries collected less in total road user charges than estimated maintenance requirements for main roads. The basis for road user charges needs to be reviewed in order to correct the overall imbalance between collected charges and required expenditures. Charging instruments must be designed to provide a better balance between road costs attributable to trucks and their current taxation. User charges are currently not collected effectively nor in a way that ensures road users to pay for the damage and correspondingly the cost of repair for road use. The UDEAC organization should be well placed to address more effective and equitable road user charges in the region.

# 1. INTRODUCTION

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This study of the road sector in the UDEAC region was carried out in connection with the strategy of the Road Maintenance Initiative (RMI) to make its findings available to all Sub-Saharan African Countries. The study's overall objective was to review the state of the road sector regarding adequate infrastructure service.

Union Douanière et Economique de l'Afrique (UDEAC) has been concerned with the poor state of the road network in the region and the obstacles to trade caused by inadequate road transport conditions and cumbersome transit regulations. The UDEAC countries have agreed to a program of reforms to improve transit conditions in the region. The program aims to develop a well functioning regional market and has been promoting policy reforms in the transport and communications sector. UDEAC has taken a great interest in the Road Maintenance Initiative (which is financed by a coalition of donors and administered by the Africa Technical Department of the World Bank as one of the components of the Sub-Saharan Africa Transport Program (SSATP).

Since 1991, the RMI, in its second phase, has been working with twelve pilot countries—one of which, Cameroon, is in the UDEAC region—to find ways of putting road maintenance on a sustainable long-term basis. In recent years, some of the UDEAC countries have begun improving their road management structures and establishing financing mechanisms that ensure a stable flow of funds for road maintenance. Others have started the change process by reviewing the present constraints in the road sector, and proposing measures for their governments to take.

The first phase of the study, including field trips for data collection, was carried out from May 1998 to October 1998. During this period at least one team member visited each of the UDEAC countries, as well as the Democratic Republic of Congo, to gather information and to interview government officials and other road sector stake-holders. (The reports and other documentation collected are listed the end of each country section in Chapter 3; general and region-wide reports are listed at the end of Chapter 2.) Some road administrations had taken advantage of the questionnaire forms that had been sent out in advance, which helped data collection and provided a good basis for policy discussions. The information showed that, generally, only a few of the UDEAC countries follow a systematic approach to road sector data collection and storing. This area requires considerable improvement if we are to learn from previous experiences and to improve the region's road sector planning. In some of the countries, data collection was particularly difficult because of ongoing or recent civil wars or unrest. In some cases, basic road sector data had been lost or deliberately destroyed—for example, two days before the study team arrived in Kinshasa in the Democratic Republic of the Congo, the whole road agency management was removed for political reasons.

Of course, the unstable political situation during the last decade has affected the road sector. In some countries in the region, road agency staff are working under extremely difficult conditions, lacking the most basic equipment and facilities to do a proper job. Since 1989, political unrest has also led to stagnation in the demand for infrastructure services. During this time, the number of vehicles in the region decreased by about 20,000 vehicles to a total of about 396,878 in 1997. The size of the total vehicle fleet is uncertain, since the statistics from the Democratic Republic of Congo are uncertain, accounting for more than one third of all vehicles in the region. UDEAC is the only SSA region where a decrease in the number of vehicles could be registered during the last

decade. The stagnation in the demand for infrastructure service in UDEAC seems to be closely related to the unstable political situation that has remained throughout the last decade. The crippling effect of the civil wars and unrest on the economy of several of the UDEAC countries, has had a direct impact on demand for infrastructure service. Changes in total length of paved roads is also a fairly good indication of economic development of a country: For the eight UDEAC countries combined , the length of paved roads increased only marginally by about 100 kilometers each year during the last decade, to a total of 10,588 kilometers in 1997.

## 2. OVERVIEW OF THE ROAD SECTOR IN THE UDEAC COUNTRIES

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*This chapter provides an overview of the road transport sector in the UDEAC region and an analysis of the developments since 1989, when a previous overall status was established. It also includes a discussion of some of the key problems facing the sector in UDEAC countries and initiatives taken to solve them.*

### Profile of the region

#### Geography

The *Union Douanière et Economique de l'Afrique Centrale (UDEAC)* includes seven member countries: Cameroon, Central African Republic (CAR), Chad, Congo, Equatorial Guinea, Gabon and São Tomé & Príncipe. In addition to these countries, this study surveyed the Democratic Republic of Congo (DRC). The study refers to these eight countries collectively as the **region**. Hence, the region surveyed covers an area of 5,366 million square kilometers, with a total population of about 57 million. The average population density of the region is 11 persons per square kilometers, as compared to 18 in the SADC region, 32 in the COMESA area (Eastern and Island Countries), 32 in the ECOWAS region, 25 in the USA, and 69 in Europe. The population density varies greatly from country to country, ranging from a low of 4 persons per square kilometers in Gabon to about 150 in São Tomé & Príncipe. Also Central African Republic (CAR), Chad and Congo have a very low population density of less than 10 persons per square kilometer.

#### Physiography

The UDEAC region generally displays four types of physical features:

- Countries along the Atlantic Ocean and the Gulf of Guinea with a coastal belt of mangrove swamps, flood plains, flat to undulating coastal plains, a desert plateau in the central area, and gently rolling savannas and low mountains in the north (close to the Sahel),
- Countries in the Sahel area with mostly barren, flat desert plains and sand dunes in the Sahara,
- São Tomé, an island country with a narrow coastal plain,
- Tropical forests.

#### Climate

The UDEAC region is mostly tropical with three distinct climatic zones:

- hot and humid coastal plains,
- semi-arid, hot and dry in the north,
- a hot, dry and dusty desert climate in the Sahel area.

#### Economy

Recently, economic development in the UDEAC region has been hampered by civil wars, political unrest, frequent changes of governments, and civil crises. As many as six of the eight countries surveyed in the study have in varying degree been hit by some sort of political and economic disturbance during the last decade. Gabon is an exception, and with a GNP per capita in 1996 (World Development Report 1997) of US\$3,490, it is the only country in the region that belongs to the “upper-middle” income economies. The seven other countries belong to the “low-income economies,” with a GNP per capita of less than US\$700 dollars in 1997, and ranging from US\$120 to US\$650. The average GNP per capita of US\$355 compares with US\$180 in the COMESA area

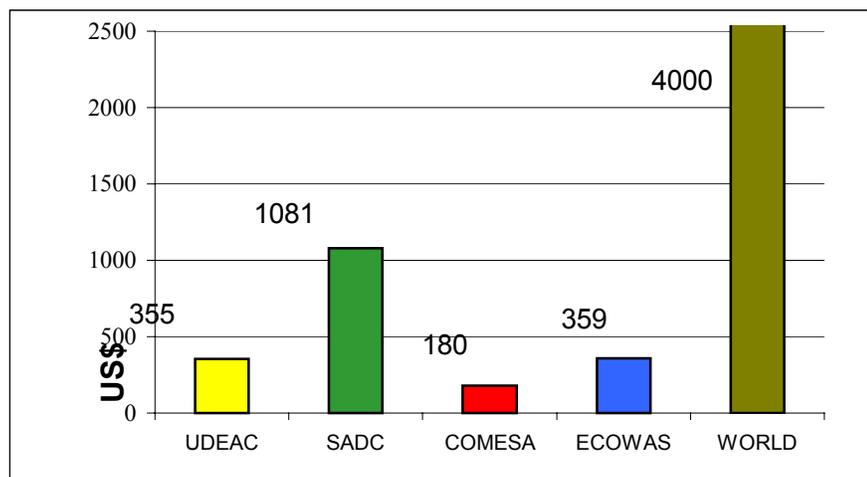
and US\$1,081 dollars in the SADC region (including RSA), and US\$358 in the ECOWAS region. Table 2.1 includes basic indicators. Figure 2.1 compares the average GNP per capita with those of some other economies.

**Table 2.1. Basic indicators-UDEAC countries**

Country	Area (1000 km <sup>2</sup> )	Population (Million)	GNP (US\$ million)	GNP/capita (US\$)	Persons/km <sup>2</sup>
Cameroon	457	13,3	8645,0	650,0	28,0
CAR	623	3,3	1122,0	340,0	5,3
Chad	1284	6,4	1152,0	180,0	5,0
Congo Br	342	2,6	1768,0	680,0	7,6
DRC	2345	30,0	3600,0	120,0	12,8
Eq̄ Guinea	28	0,4	152,0	380,0	14,3
Gabon	268	1,1	3839,0	3490,0	4,1
S̄o Tom̄ & Pr	1	0,2	52,5	350,0	150,0
UDEAC	5366	57,3	20330,5	355,1	10,7

Source: World Bank, World Development Report, 1997.

**Figure 2.1. GNP per capita (1997)**



## Demand for infrastructure services

### General demand

Previous studies have found a close correlation between demand for infrastructure services and economic performance. (World Bank Transport Sector Policy Review [World Bank 1994]). This was also confirmed by the traffic data and economic statistics collected for the present study. The demand stagnated during the last decade in the region, most probably because of political disturbances and hence poor economic performance. The total vehicle fleet in the region decreased by about 20,000 units to less than 400,000 vehicles. This corresponds to an average vehicle density of 68 vehicles per 10,000 persons. Although there was an average decrease, some countries in the region experienced a growing demand. For example in Chad, with the lowest vehicle density of 49

vehicles per 10,000 persons, traffic increased heavily in the beginning of the 1990s, with an annual growth rates of 25 percent, in line with the improved economy and greater car ownership.

#### *Demand for better roads and service*

One feature of the region is the sparsely populated and vast land areas. Because of weak economies, governments have been unable to expand road networks to serve the most remote rural areas. Improving transport infrastructure then is a priority to reduce poverty in rural areas. A survey carried out in Cameroon found that as much as 86 percent of the people interviewed thought that poor transport was the major cause of poverty. Many of the problems of the poor were compounded by the limited or non-existent road infrastructure, which cut off many villages and made some inaccessible for up to four months during the rainy season.

#### *Landlocked economies and international transport*

The Central African Republic and Chad are the two truly landlocked countries in the region. However, the Democratic Republic of Congo faces many of the same problems because of its vast land area and the narrow outlet to the Atlantic Ocean in the west. These countries depend on transit road traffic through neighboring countries. International through routes become lifelines for import and export, and they all share many of the same problems regarding international trade transport.

In the UDEAC region, road transport is complemented more by rail and river transport than are other SSA regions. For example, in the Central African Republic transport on some 2,616 kilometers of navigable rivers complement road transport. International surface transport is divided between river transport to Brazzaville (Congo) and from there by rail to Point Noire (1,850 kilometers) and road transport to Douala in Cameroon (1,650 kilometers). Chad has a distance of almost 2,000 kilometers from the sea and vast distances between the urban centers, and the future development of the economy depends more than usual on an transport capacity and reduced road transport cost. Chad has no railway, and erratic rainfall patterns in recent years have had a negative affect on the navigability of the waterways.

The Democratic Republic of Congo's transport system is an interconnected network of rivers, railways and roads, with the dominant transport element being the Zaire River and its tributaries. Here, the network of rivers is complemented by about 5,000 kilometers of railways. Most roads in the Democratic Republic of Congo were built during the colonial period to provide local access to the rail and river networks. A few major roads provide interregional transport.

#### *Urbanization and demand for infrastructure service*

The level of urbanization—that is, the percentage of the population living in towns and cities—is exceptionally high in Gabon, more than 70 percent. The rapid urbanization has brought a heavy demand for transport in the largest cities, like Libreville. Car ownership and traffic increase most in urban areas, leading to congestion and environmental problems because of excessive traffic. On the other hand, the small urban centers in remote areas resemble large villages, and typically suffer from few proper access roads and ineffective social and health services.

#### *Future demand of road infrastructure service*

Since 1989 the aggregate number of vehicles decreased by about 5 percent. The average vehicle density of 68 vehicles per 10,000 population is very low compared to industrialized countries. This indicates a large potential for growth, depending on the future political stability and economic growth in the region. The UDEAC region has a more diversified transport system than other SSA regions, relying to a greater extent on both rail and inland river transport. However, most of the demand for transport will be in the road sector. The worldwide road motor vehicle fleet is expected to grow from 557 million in 1989 to 745 million in 2000, which means more than 10 times its size

from 1950. This rapid growth in the world's vehicle fleet will most likely occur in countries at the threshold of higher industrialization. The UDEAC region has experienced stagnation and, in some countries, a reduction in the size of the vehicle fleet because of the declining economies. However, some countries with a relatively advanced economy, like Gabon, are likely to experience a rapid growth in the size of the vehicle fleet and the corresponding demand for transport.

### **Vehicle fleet**

Vehicle statistics are uncertain for many of the countries, and in particular for the Democratic Republic of Congo, where no recent data were available. Cars represent the largest vehicle type group with about 50 -60 percent of the total. 'Lorries and Heavy Goods' make up about 15-20 percent. Vehicle population grew slightly in six of the eight UDEAC countries during the reporting period. Highest growth was recorded in Chad, where the fleet increased from about 14,000 vehicles in 1989 to about 31,506 vehicles in 1997. The size of the vehicle fleet declined both in Congo and the Democratic Republic of Congo due to civil wars, although the exact numbers are not known. The total number of vehicles in the whole region declined from about 414,285 in 1989 to about 394,378 in 1997.

Vehicle density in the region in 1997 was about 68 vehicles per 10,000 people; slightly below ECOWAS with 72 and well below the average for the SADC region (762 including and 150 excluding the Republic of South Africa) but higher than in the COMESA area (58). Chad and Equatorial Guinea had the lowest vehicle densities in the region, with 49 and 20 vehicles per 10,000 people respectively. This compares with COMESA, where Ethiopia had an extremely low vehicle density (17). In the SADC countries, Mozambique had the lowest vehicle density (22), mainly because of a prolonged period of unrest in the country. Vehicle density expressed as a number per 1,000 square kilometers (spatial density) varies from a low of 25 in Chad to 264 in Cameroon. In comparison, ECOWAS had an extreme low of less than 10 in the large and sparsely populated Mauritania to more than 3,000 in Cape Verde, an island of only about 4,000 square kilometers in total surface area.

### *Demand and prioritization of maintenance*

Four of the UDEAC countries—Cameroon, Central African Republic, Chad and Gabon—have all taken steps to develop a “priority” road network commensurate with the means available for maintenance. This is an important step to improve road management, since the basis for funding road maintenance on a sustainable basis is weak in most countries in the region. The resources and capacity to repair and maintain all the existing networks, including main roads and rural feeder roads, are clearly not available to the majority of the countries. The Government of Chad especially has imposed a strict priority for maintenance, and has selected a bare minimum of roads as first and second priority. However, Chad is unique in that travel by car in the dry season is possible in many areas without engineered roads.

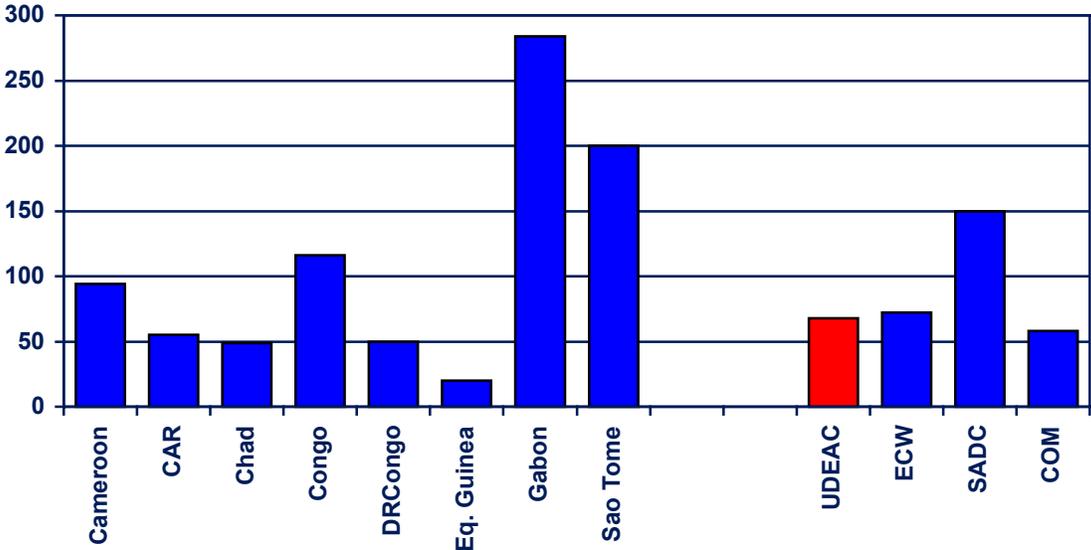
### *Maintenance burden of road users*

For the region as a whole, the total road network length averages 13 kilometers for every million U.S. dollars of GNP<sup>4</sup>. The length of main roads averages about 4.4 kilometers for every million dollars of GNP, as compared with 3.6 kilometers in ECOWAS. For example the Central African Republic has about 21 kilometers of road per million GNP, which means that fully adequate maintenance of all roads would require more than five percent of GNP per year. The Democratic Republic of Congo, with 37 kilometers of road to maintain per million GNP, is typical for many SSA countries in this respect: many kilometers of roads per capita, relatively sparsely populated, and with a low economic capacity per kilometer of road to be maintained.

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<sup>4</sup> See appendix 1

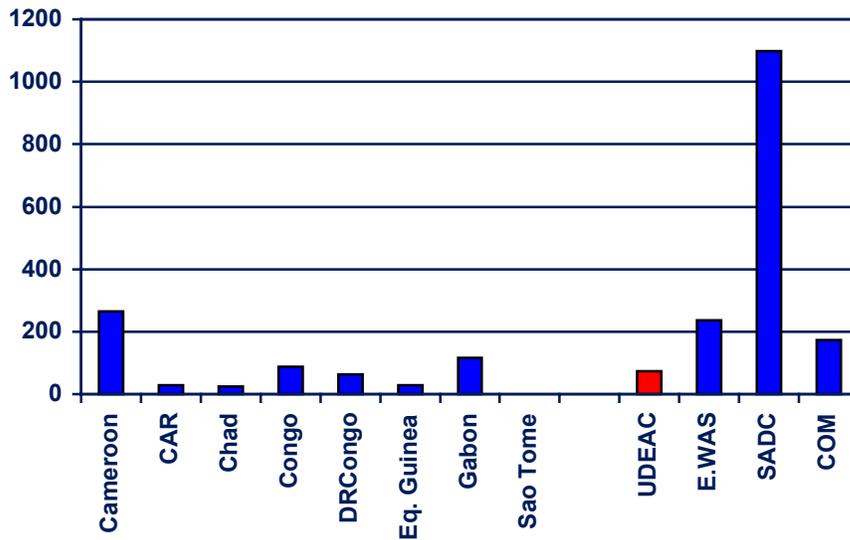
Figure 2.2. Vehicles per 10,000 inhabitants (1997)



**Road Traffic**

The main road network of about 90,148 kilometers represents about 36 percent of the total road network in the UDEAC region, but carries probably 80–90 percent of the total traffic. Traffic flow figures tend to be moderate to high in the vicinity of urban centers. Traffic on the rural access roads network is very light, mostly less than 50 vehicles per day. For example on the rural access roads in the Democratic Republic of Congo, traffic rarely exceeds 5 vehicles per day, if roads are at all accessible by car.

Figure 2.3. Vehicles per 1,000 square kilometers (1997)



*Road traffic safety*

The fatality per vehicle rates are high for all the countries in the region. About 2 167 persons were killed from road accidents in the region in 1997. (This includes an estimated number of 750 people killed in DRC, where no statistical data have been obtained, based on average fatality rate in other countries in the region). Pedestrians and passengers of public service vehicles are probably the main victim group.

Within the region Cameroon has the highest fatality per vehicle rate of about 72 persons killed in road accidents in 1997 per 10,000 vehicles (906 fatalities). Lowest fatality rate was recorded in Chad with 20 persons killed in road accidents per 10,000 vehicles (49 persons killed). This is a very low figure compared to most other countries in SSA, and may be due to an underreporting of fatal accidents.

## The roads network

Figure 2.4. Vehicle fleet (1997)

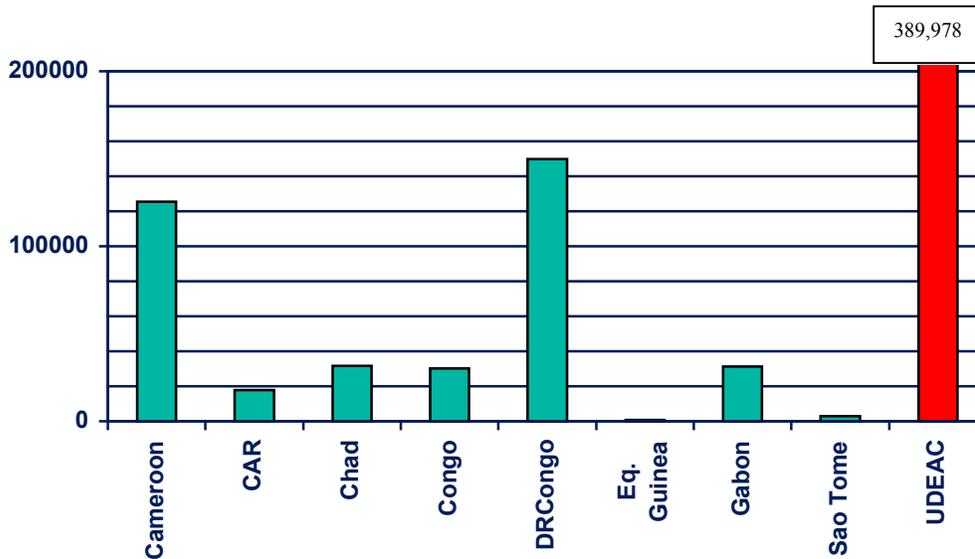
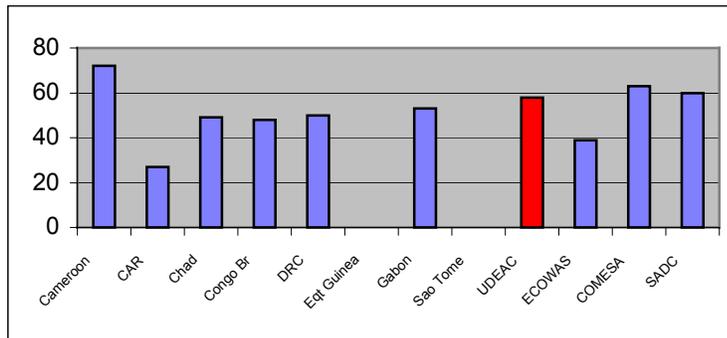


Figure 2.5. Fatalities per 10,000 vehicles (1997)



### Road lengths and classification

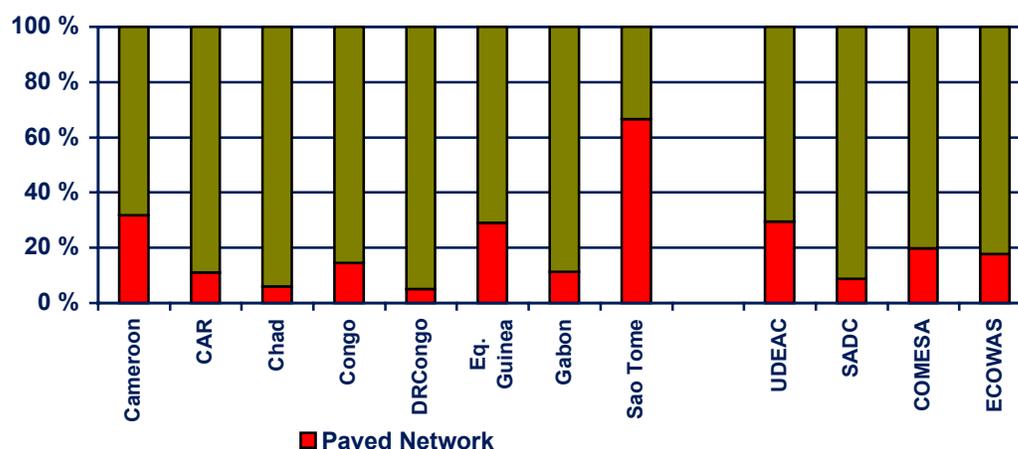
Data on road lengths and road conditions for each country have been compared to a similar survey carried out in 1989. Comparison is made for four groups of road: *main roads*, *rural roads*, *urban roads*, and *other roads*. When surveys were carried out for the SADC, COMESA and ECOWAS regions, it was found that these designated groups do not conform to the classifications used by the individual countries in the area. In fact classification systems vary from country to country. No two countries have the same, and there is no uniform and functional system in use throughout the region. In some countries the network is divided into primary, secondary, and tertiary roads; in others, the “main roads” network includes national roads and regional roads connecting district centers. For this UDEAC survey, some road agencies have also defined “main roads” as the priority network subject to scarce maintenance funding. In an effort to have similar sources of data from survey to survey, respondents were asked in the questionnaire to specify one of the following definitions used for “main roads”: a) a specific preferred network, including also national roads; b) a specific economic preferred network, including national roads; c) national roads as a whole; d) actual maintained network, including other than national roads; e) actual maintained network, including only national roads; and ; f) others. In the UDEAC region, the respondents defined "main

roads" as shown in Table 2.2 below:

**Table 2.2. Road classification (used to divide road lengths and road conditions)**

Country	Definition used for "Main Roads"
Cameroon	A defined priority network, including roads other than national roads
Central African Republic (CAR)	A defined priority network, including only national roads
Chad	First and second priority roads
Congo	
Democratic Republic of Congo (DRC)	Primary Roads, Secondary Roads
Equatorial Guinea	Main Roads
Gabon	National Roads, Regional Roads
São Tomé & Príncipe	Priority Network

**Figure 2.6. Total network: Distribution of paved/unpaved roads**



### *Lengths*

In 1997 the total road length in the UDEAC region comprised about 256,668 kilometers of roads, including 90,148 kilometers of main roads, 135,923 kilometers of rural roads, 2,215 kilometers of urban roads and 17,073 kilometers of farm roads, forest roads, and other roads. The replacement value of the main roads network alone is about US\$ 6.5 billion and the required annual expenditure on routine and periodic maintenance of main roads (not including needed rehabilitation) is about US dollars 243 million.

In comparison the total road length in the ECOWAS region in 1997 was about 446,328 kilometers of roads, including 164,496 kilometers of main roads, 201,775 kilometers of rural roads, 15,658 kilometers of urban roads, and 60,199 kilometers of other roads. The total road network in the eleven SADC member countries in 1997 was about 827,000 kilometers of roads, including 316,000 kilometers of main roads, 486,000 kilometers of rural roads and 25,000 kilometers of urban roads.

Total road network in the twelve COMESA (Eastern and Island countries) in 1997 comprised about 327,211 kilometers of roads, including 136,106 kilometers of main roads, 176,543 kilometers of rural roads and 14,582 kilometers of urban roads.

Information about network road lengths cannot be reliably compared from period to period—there are too many uncertainties in the statistical data. Information about total road lengths vary widely, depending on which roads are included, and also because road inventories are uncertain for the unclassified road network. The main road network is relatively well identified and recorded by lengths and location: Central African Republic and Chad maintain regularly updated inventories of the main road network. Cameroon, Congo, Gabon and Equatorial Guinea have recently recorded inventories of main roads, although not updated on a regular basis. São Tomé has a small road network totaling only 300 kilometers. Road lengths for Democratic Republic of Congo are very uncertain.

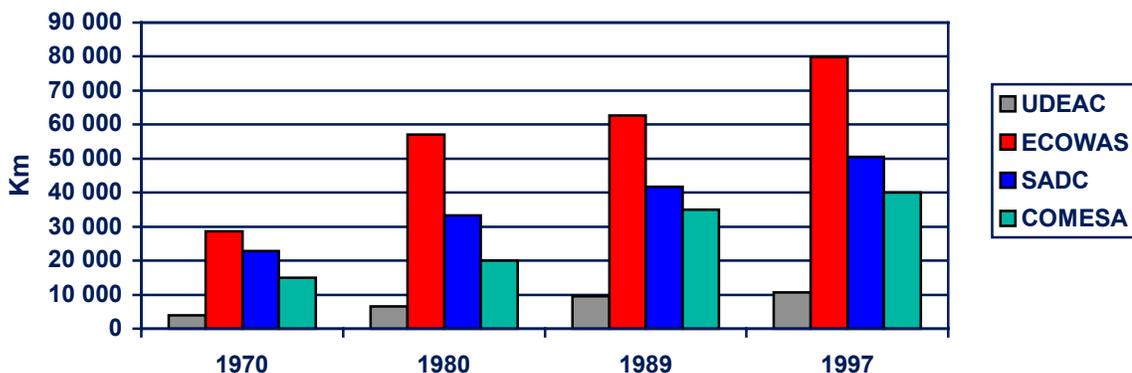
Rural roads (comprising district roads, feeder roads, and unclassified roads) are more uncertain, and the length of the unclassified road system in most cases is based on crude estimates. The “rural road” network is also far from uniform in standard. Therefore road network lengths given are uncertain and should be treated with caution.

#### *Paved road lengths*

The length of paved roads in the region increased by about 4 percent annually over the last three decades. From a total length of about 3,997 kilometers in 1970, it increased to about 10,588 kilometers in 1997. In contrast the total paved roads length grew very slowly during the last decade at about 100 kilometers, or 1 percent per year. The total average coverage of paved roads in the region is also modest, with about 185 kilometers per million persons, which is the lowest of the four regions of SSA.

The coverage of paved roads compares with about 399 kilometers for ECOWAS, 192 kilometers for the COMESA area, and 592 kilometers in the SADC region (1993)—about 1,335 as an average for “middle-income” economies and more than 10,000 kilometers for “high-income” economies. Chad has an extremely low coverage of paved roads with only 45 kilometers per million people. As a comparison Mali has the lowest density of paved roads in the ECOWAS region, with about 284 kilometers per million people, and Ethiopia has the lowest in the COMESA region, with a density of paved roads of only about 66 kilometers per million capita.

Figure 2.7. Paved road network growth: UDEAC/ECOWAS/SADC/COMESA



### Road conditions

Data in Appendix 1 show the changes of average road conditions from 1989 to 1997 for each country. However, these average data for the whole region should be treated with caution. Monitoring of road conditions are not carried out regularly and are not based on the same set of parameters. Data on road conditions for 1997 were mostly obtained from the main road agencies. They are believed to be fairly reliable for five of the countries, where data have been extracted from relatively recent surveys, and in some cases adjusted for most recent trends. However, roughness measurements, which are essential for estimation of vehicle operating cost, are still not widely used by road agencies. For Congo, the Democratic Republic of Congo, and São Tomé, condition data are uncertain.

The standard definitions used for road condition were as follows:

- Good* = Needs only routine maintenance, does not require periodic maintenance the three first years.
- Fair* = Needs periodic maintenance before three years to avoid structural disorder.
- Poor* = Too much damaged (structural disorder) to warrant periodic maintenance.

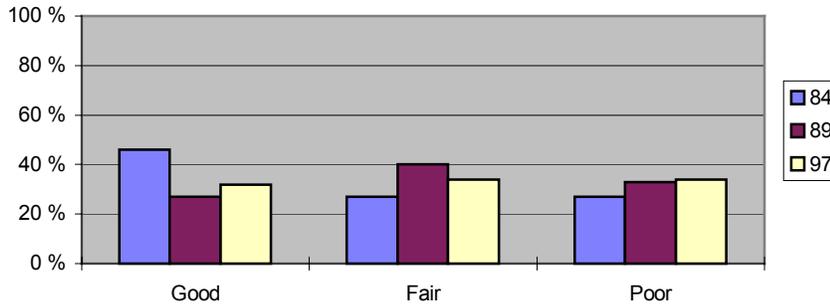
All five countries in the UDEAC region where road condition data were based on some sort of condition survey, have adopted the above definition<sup>5</sup>

For the “main paved” network the average percentage of “good” changed from 27 in 1989 to 32 in 1997, whereas the percentage of “poor” increased from 31 to 34. These relatively minor estimated changes are considered to be well within the margin of error of collected data. That conditions have remained stable is most probably a result of a massive rehabilitation effort during the period in many of the countries, mainly by donor funds, and not the result of regular maintenance.

For the main unpaved road network of the UDEAC region, the data could indicate a trend of further deterioration. The average percent age of “good” went down from 37 in 1989 to 20 in 1997, and the percentage of “poor” increased from 31 to 55 in the same period. This shows a general downward trend, which is mostly due to inadequate maintenance, but could also be attributed to more traffic and heavier loads on gravel roads.

<sup>5</sup> See appendix 10

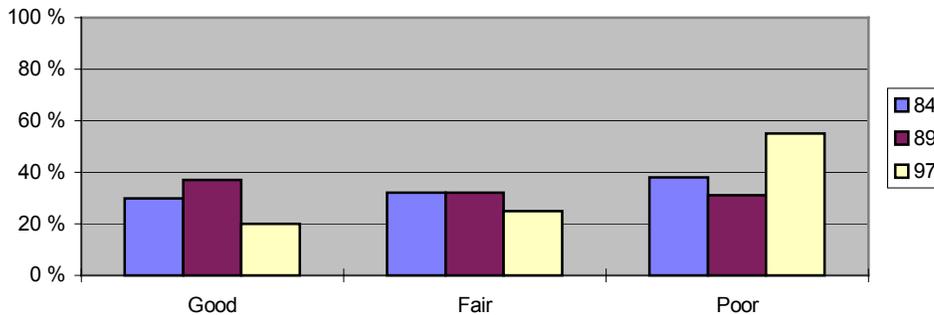
**Figure 2.8. Main paved road condition: UDEAC**



*Extra vehicle operating cost due to poor road conditions*

The poor condition of the main road network, which carries most of the traffic, represents a considerable sum of money each year as extra vehicle operating costs. Data are too uncertain to carry out an accurate estimate of potential savings in the total network with improved conditions. That would require more detailed condition data and information about traffic distribution and composition. However, one indication is that improving conditions from “poor” to “fair” would reduce vehicle operating costs by about 25 percent for heavy vehicles and by about 15 percent for cars. Total vehicle fleet in the region is about 390,000 vehicles. With an average transport length of about 25,000 kilometers per year, the total transport per annum in the UDEAC region is about 10 billion kilometers. By using the standard composition of cars (56 percent), light commercial vehicles (20 percent), buses (4 percent) and medium and heavy goods vehicles (20 percent), an order of magnitude estimate of total vehicle operating costs would be US\$3 to 4 billion. Good maintenance would easily reduce vehicle operating cost by 10 percent, which would represent a saving of about US\$300–400 million annually for the UDEAC countries. In comparison, this amount would be more than enough for an adequate maintenance of all main roads in the region.

**Figure 2.9. Main unpaved road condition: UDEAC**



*Replacement values*

The replacement value of the total main roads network was estimated to be about US\$6.5 billion, using a replacement cost of US\$250,000 per kilometers of paved roads and US\$50,000 for unpaved. (Replacement costs of rural roads are uncertain because no accurate data exist, and, in

some cases, the standard of roads vary from reasonable access roads to non-motorized tracks. However, it would probably add another US\$1 billion to the total). Required funds for routine and periodic maintenance of the main roads only would require about US\$300 million per year. This does not include the cost of necessary rehabilitation, which in some cases amount to considerable sums of money.

A study carried out by GTZ in 1996, estimated combined road network asset values for the three countries Cameroon, CAR, and Chad to be around US\$4.7 billion.

## **Road management**

### **Institutional arrangements**

#### *Main roads*

Government departments manage the main roads in all eight countries. The main road agencies are part of the civil service and face the same constraints as other government agencies, with inadequate salaries and conditions of service.

#### *Urban roads*

In most countries, municipalities or city councils manage urban roads, such as in Libreville, Yaounde, and N'Djamena. National roads that go through urban areas are mostly managed by the main road agency. But there are exceptions, where the municipalities maintain the national roads within the city boundary.

#### *Rural roads*

District administrations usually manage rural roads, although in practice very little maintenance or other road works are done because of a lack of resources. In most countries, district administrations have access to technical advice from the main road agency. Central coordination of the rural road development, both technical and financial, and maintenance are arranged differently in each country. In some countries, rural roads management is coordinated by a section in the Ministry of Local Government.

Some rural roads are also under the responsibility of various agricultural agencies, such as cotton companies, coffee companies or livestock companies. However, limited budget funds have prevented most of the agencies from adhering to regular maintenance programs. Also, rural access roads under a government ministry, such as the Ministry of Rural Development in the Central African Republic, have received practically no funds for maintenance and have become almost inaccessible by cars. Consequently, inputs, collection, and marketing of cash crops and food crops, become difficult and expensive because of the high vehicle operating costs.

#### *Staffing and salaries*

In most countries, employment conditions in road agencies are poor. Meanwhile, the private sector has been willing and able to pay competent technical staff much higher salaries. Road agency staff in all eight countries have salaries well below the private sector, and there is a serious disparity between the salaries of engineers and managers in the private and public sectors in the UDEAC region. Engineers are typically paid annual salaries from US\$1,200 to US\$2,500, as compared to between US\$5,000 and US\$15,000 in the private sector. Although the public sector has so far been able to attract well qualified personnel, the long tradition that young professionals sought a job in the public sector is now changing. As the private market gradually becomes more stable and reliable it becomes highly competitive with the public. This is first affecting such areas as

accounting, where in some countries it is already difficult to get qualified personnel to stay in the civil service

#### *RMI concepts implementation*

The RMI concept for improved road management appears to have won broad acceptance from road agencies in the UDEAC region. The consultant also carried out a review of the implementation of the RMI four building blocks, the findings of which are presented in a separate report; *Appraisal of the RMI Concepts Implementation In Sub-Sahara African Countries (SSA)*. In the RMI Concepts Implementation Monitoring System, the total average score for the UDEAC countries is presently about 26 points, on a scale from 0 to 100. The average total score is about the same as for the COMESA countries, but lower than SADC and ECOWAS, with average scores of about 37 and 33 respectively. Of the UDEAC countries, Central African Republic and Chad have both showed positive developments in the implementation of the RMI concept, with average "implementation scores" of about 50.

## **Work execution**

### **Road maintenance activities**

In the UDEAC region there has been a change towards more use of contracts both for routine and periodic maintenance. Private contractors participated in road maintenance in a very limited amount in the first years of the reporting period. Force account brigades used almost all of whatever scarce funds were allocated for maintenance. Private sector contractors were generally blocked to compete for road maintenance work.

In Cameroon during the last decade, investments were given priority, and road maintenance was neglected. The government was committed to paying salaries of employees and was unable to fund maintenance. Low productivity of maintenance was caused by inefficient management, non-performing force account teams to do the jobs, and a lack of available equipment and financing. The maintenance program now proposed for the years up to 2000, has been based on a study of rehabilitation need and periodic and routine maintenance for the whole road network. For each maintenance intervention, there will be a progressive participation of private contractors.

In the Central African Republic, road maintenance has been inadequate for a number of years, despite considerable external assistance. Consequently, following the substantial investments made during the rehabilitation program of 1982–1986, the road network has begun to deteriorate again. The government has initiated studies to reduce the effect of the land-locked position of the country. The first phase of the transport sector project was completed in 1996. A second phase is being discussed with the European Union, and would eventually have the following objective:

- improve sector institutions
- improve planning criteria for sound investments
- improve planning and management of road maintenance including use of private sector resources for production
- focus on regional cooperation for international road transport
- liberalization of the transport sector
- reduce the social costs of road transport with focus on traffic safety and environmental problems.

In Chad, the *Office National des Routes (OFNAR)* used to be responsible for road maintenance. From 1984 to 1993, it went through a process of commercialization and privatization, and was reorganized in 1989 as a public establishment with a legal personality and financial autonomy under the direction of the parent ministry. With a view to its privatization, the personnel holding

was reduced from 1,100 to 600 and restructured in 1993. OFNAR ceased its activities and the *Société Nationale d'Entretien Routier (SNER)* was created. SNER was a mixed corporation with 98 percent of its capital held by the State. OFNAR's equipment was transferred to SNER at a residual value of about US\$4 million, repayable to the State (CAER) in three years. SNER has a staff of about 414, including two expatriate professionals. In 1995, half of all routine maintenance works were allocated to SNER on a sole source basis, while bids were sought on the other half, for which SNER could not bid. SNER has already obtained several contracts for periodic maintenance work through competition. The intention is to open the company's capital to private shareholders.

In Gabon the Directorate of Transport Infrastructure (DIT) is responsible for road construction and maintenance by contract, while the Directorate of Roads and Aerodromes (DERA) is responsible for maintenance work by force account. The DERA has four regional directorates, each again divided into 16 local sub-divisions. In 1997 about 75 percent of expenditure of routine maintenance and 100 percent of periodic maintenance was carried out by contracts. A study carried out by Tecslut International Limited in 1997 on private sector capacity identified about ten small and medium sized enterprises (SMEs) that would be interested to bid for road maintenance contracts. Most of the small contractors have had a limited turnover, as most of the work has been carried out by *Direction Générale des Travaux Publics (DGTP)* and with equipment supplied by the public directorate of equipment (DOM). Another common problem is a lack of qualified management staff. Some labor-based contracts have been tried with mixed results because of a lack of supervision.

#### *Management contracts*

The change from force account operations to contracting has altered the role of management. The focus is now much more on quality control and supervision, which has had a marked effect on works execution. The quality of work has improved with the need to design and specify all road works and the tighter supervision of contracts.

With the changed roles of road management, some road agencies have realized that they lack the capacity to carry out all the functions required of an effective client. Key client functions would be procurement, cost and quality control, and supervision. Some of the road agencies in UDEAC have therefore adopted a model of contract management of maintenance work used successfully in other West African countries, such as Mali and Senegal. Part of routine maintenance is typically carried out through works agreements delegated to an Agency for the Execution of Work of Public Interest for Employment (AGETIPE). The government contracts AGETIPE on an annual basis to act as a project manager for public works, to procure and manage local contractors who are free to select their own method of execution, whether labor-based or mechanized. Experience so far shows that a number of tasks have been carried out manually in all contracts, such as clearing of bush, surface repairs, and sign repairs.

#### **Equipment management**

In the past, all the countries in the UDEAC region have relied on public plant pools for force account operations, either construction or maintenance. Public plant pool have traditionally been managed directly by the road agency or by a separate department, such as in Gabon. Road agencies responsible for road maintenance have been obliged to hire their equipment from these plant pools, which have invariably failed to deliver satisfactory service. Poor equipment management has been one of the major constraints to effective maintenance in many SSA countries. Common problems seem to be generally low availability of plant, limited equipment fleet, insufficient funds to replace old stock, and a lack of qualified mechanics to maintain the equipment. Equipment management for road works is also changing. Many countries are in the middle of a transition from publicly owned fleets of plant and vehicles to public/private commercial plant pools and private contractors with

their own equipment. These changes are partly the result of the structural changes of road management, with the private sector more and more responsible for works execution through contracts, and also partly due to the rather dismal performance in the past of public plant management.

The situation now is that the road agencies in Equatorial Guinea and São Tomé & Príncipe have only skeleton equipment fleets. Chad has no public plant pool. Congo and Democratic Republic of Congo used to have large equipment fleets. However, these fleets have now been destroyed or are in disrepair. In Cameroon equipment management has been the responsibility of *Parc National de Matériel de Génie Civil (MATGENIE)* (Equipment Pool), a parastatal under the jurisdiction of the Ministry of Public Works (MINTP). MATGENIE is now going through a process of change, focusing on commercial management and accountability. In Central African Republic the *Direction du Matériel des Travaux Publics (DMTP)* is responsible for management and upkeep of all plant and equipment for force account operations. The Directorate is in charge of a workshop for heavy vehicles and engine overhaul, and for purchase of materials for public works. The government's policy favors increased use of the private sector for road management. However, there is no private equipment pool in the country, so for now the government has opted to rely on the public plant pool.

In Gabon the Directorate of Equipment (DOM) under the Directorate of Public Works (DGTP), is responsible for procurement of equipment, supply of spare parts, and major repairs of equipment. It operates a central workshop in Libreville, adequately staffed and well equipped. The road maintenance equipment is assigned to the four regional sub-divisions, which are then responsible for its operation and for minor repairs. At the end of 1997, the fleet of equipment includes about 900 units, a large portion of which are old and out of repair. The renewal cost of the fleet is estimated at about US\$80 million. In 1997 a study was carried out by a Canadian consultant, Tecslut International Ltd, to review the status of equipment management by DOM. It was found that the organization lacks qualified and motivated staff. There is no strategy nor budget for renewal of plant. The study recommended that the size of the equipment fleet should be scaled down in step with an increasing reliance on private sector resources for maintenance work. At the same time options for commercialization or privatization of DOM should be considered.

The total replacement value of the public plant pools in the eight UDEAC countries is approximately US\$150 million. Only a limited number of the more than 1,500 hundred items would eventually be needed for the road agency's own force account operations in the future. As force account operations are reduced, public plant pools would be turned over to private business, possibly through a period of "commercialization" first.

### **Work methods**

In most of the region, the governments expressed a commitment to increasing the share of maintenance works carried out by private contractors and consequently to a reduction in the use of force account. In the long term only a skeleton force account brigade will be retained for training, emergencies, and for works that do not interest private contractors. A commercial orientation of the road agency leads to focus on cost-effectiveness and less room for the management to consider the social factors of the operations. At the same time, the government encourages the development and use of labor-based methods in order to create local employment and reduce the foreign currency requirement. Labor-based methods have now been tried out for a number of years in the region. Donors have assisted with implementation, often on a pilot basis, with technical personnel and financing.

## Financing

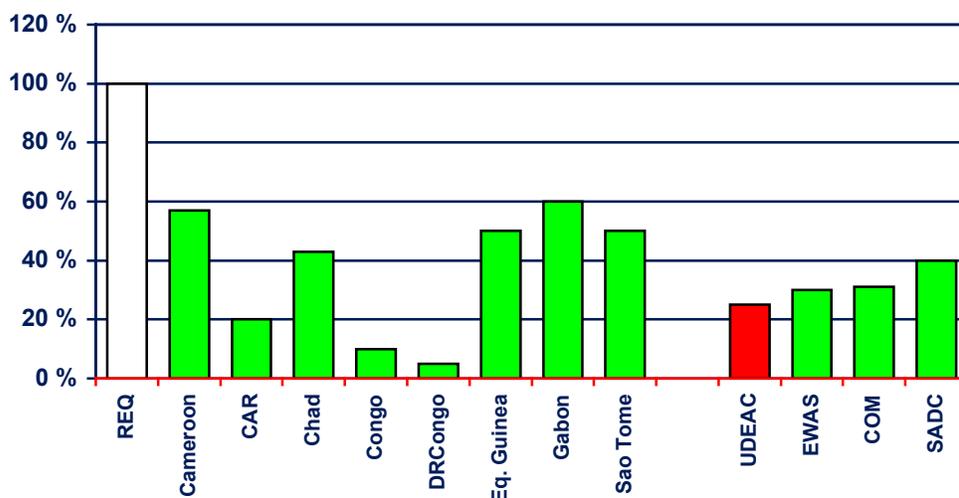
### Road financing

During this time, road investment has typically been funded 80 to 90 percent from external sources. The total road network in the region did not expand during the reporting period from 1989 to 1997. Paved road lengths increased only moderately by about 1,046 kilometers, or 10.7 percent in the same period. It indicates that major road investment during this period has been for rehabilitation of existing paved roads and for upgrading of unpaved roads to paved standard, and not so much for new construction. The increase in length of paved roads would indicate an average annual “capital” expenditure of US\$40–60 million in the period.

### Road maintenance funding

Road maintenance has traditionally been funded from the government budget and from bilateral and multilateral donors. Total maintenance expenditure in the UDEAC region is less than one third of estimated requirement. Road maintenance expenditure range from less than 10 percent in the Democratic Republic of Congo to about 60 percent in Gabon as a percentage of total estimated requirements.

Figure 2.10. Maintenance expenditure as percentage of requirement (1997)



### *Maintenance spending compared with estimated requirements*

A yardstick estimate of annual maintenance requirements for the total road network and the main road networks of each country was prepared, based on average costs of routine and periodic maintenance per kilometer, derived from information from HDMIII data.<sup>6</sup> This was used to compare with current actual maintenance expenditure. Road maintenance expenditure has been well below the levels needed to keep the network in a stable long-term condition in virtually all the twelve countries. Also the budget allocations have often been cut without warning, and funds rarely released on time to the road agencies. Road maintenance managers have been discouraged by the drastic cuts in budgets, which have often only been a fraction of the requirements. In 1997 the eight countries in the region spent about US\$65 million as recurrent costs for maintenance of the road network. The recurrent allocation was thus only about 25 percent of the estimated US\$260 million

<sup>6</sup> See appendix 9

needed to keep the roads in a stable condition.

#### *Road user charges and cost recovery*

The government collects revenue from road users, partly as general government tax and partly as road user charges, as shown in Appendix 8. The total collections for each country have been compared with the estimated funding required to maintain main roads. Road user fees are defined as the main taxes that road users are required to pay in order to use the road network. Some payments vary with road use, such as the tax on petrol and diesel; other payments are fixed regardless of road use, such as annual vehicle taxes. Road user fees must be distinguished from general consumption tax, often levied specifically on road users simply to raise general revenue.

The total of direct road user fees collected in 1997 in the whole region was about US\$420 million. This was less than one tenth of total maintenance requirement for main roads (US\$243 million). All road user charges collected in 1997, including government taxes and duties—that is, any general consumption tax paid by road users—totaled about US\$130 million. All eight countries collected far less in total road user charges than estimated maintenance requirements for main roads.

The Cameroon Government has introduced a wide range of taxes to collect revenues from the road sector. Taxes linked to *ownership of vehicles* include entry taxes, vehicle tax, axle load fees, and driving license stamp. Taxes linked to *vehicle use* include tax on petroleum products (customs duty, turnover tax, and a special tax on hydrocarbons), and road tolls. A toll system has been installed on the main paved roads, amounting to about US\$1 per vehicle passage, regardless of type of vehicle. Toll gates on Cameroon main roads became operational in September 1993. Cameroon has found that it is difficult to control state borders if price levels for fuel differ too much. Smuggling is relatively easy along most borders of SSA countries. A small quantity of fuel represents a relatively large value, which encourages smuggling.

The current revenue shortfall from road user charges has a serious bearing on government's ability to finance road expenditures. General cost recovery in the road sub-sector should be improved to at least cover the cost of routine maintenance, periodic maintenance, and rehabilitation (of at least the priority road network; social roads could partly be paid for by the government). The basis for road user charges must be reviewed in order to correct the overall imbalance between collected charges and required expenditures. It is essential to find charging instruments that give a more equitable distribution among users and a better balance between road costs attributable to trucks and their current taxation. User charges do not now ensure that road users pay for the damage and correspondingly the cost of repair for road use. In most countries truckers are not paying the full share of the cost, although a levy on fuel to some extent ensures higher payment through petrol consumption for the most damaging traffic.

#### **Fuel**

Information on fuel consumption was received from only four of the eight UDEAC countries. For the other four—Democratic Republic of Congo, Gabon, Equatorial Guinea and São Tomé & Príncipe—fuel consumption was estimated based on the size of the vehicle fleet and an average consumption per vehicle of 0.23 liter per kilometer. Total transport fuel consumption in the UDEAC region in 1997 was thus estimated to be about 900 million liters, representing an average consumption of 2,250 liters per vehicle per year.

Fuel consumption per vehicle varies a lot from country to country, as seen in Table 2.3. A conspicuously low consumption was recorded for Cameroon, which confirms that a considerable amount of fuel is flowing unofficially across the country borders.

### *Fuel levy potential*

Road Funds established in CAR and Chad, as well as the proposed Road Funds in Cameroon and Gabon, would have levies on fuel as the main source of revenue. Based on a total fuel consumption of 900 million liters per year for the region, an average fuel levy of 7.5 US cents per liter would accumulate a revenue of about US\$67 million per year. This is less than half the estimated total maintenance requirement for main roads of US\$243 million. Although these figures are uncertain, they demonstrate the unusually high burden on each road user (vehicle owner) in the UDEAC region, due to the low vehicle ownership.

### *Fuel prices*

Pump prices per liter of petrol are relatively similar in the UDEAC countries, from about US cents 60 to 70. However, the price of petrol in Nigeria is only about US cents 13 per liter. The large difference in price of fuel between UDEAC countries and nearby Nigeria may be a constraint to establishing effective road user charges based on fuel levy.

**Table 2.3. Fuel consumption and fuel prices in UDEAC countries**

Country	Consumption		Consumption	Road Fund	Tax	Pump
	a) petrol (Million liters)	b) diesel (Million liters)	Vehicle per Year (Liter)	Levy (US cents per liter)	per (US cents)	Price (US cents per liter)
Cameroon	31,2	26,8	462			62
CAR	15,9	30,6	2010			75
Chad	23,4	28,1	1653			60
Congo Br	26,3	42,0	2273			65
DRC						57
						67
						38
						73
						70
Eqt Guinea						
Gabon						58
São Tomé & Pr						36
UDEAC	900					
<i>Estimate</i>						

### **Road funds and new initiatives**

Road Funds have been established in the Central African Republic and in Chad, and Cameroon and Gabon are considering the concept. Also, Equatorial Guinea has been interested and a study was carried out recently to consider the financial implications.

Various designs of Road Funds have been tried in the region for a long time. For example the present Road Fund in the Central African Republic gradually developed from a "special account" in the sixties and seventies, maintained at the Ministry of Finance and funded through the general budget, to the legally and financially autonomous public institution created in 1981. The "special account" mechanism of the national budget failed to provide timely and adequate financing of road

maintenance. All members of the present supervisory board come from the public sector. About 96 percent of the revenue comes from a levy on fuel .

Governments in most countries in the region have shown a strong interest in rearranging financing of road maintenance through the establishment of a Road Fund, based on revenues from road user charges. The most important charging instrument would in all cases be a levy on fuel that could vary from 3 cents per liter to about 13 cents per liter.

## **Road User involvement in management and financing of roads**

In most countries in the region, road user associations are common—including such organizations as the Automobile Association, the Trucker Associations and Bus Operators Association. At the national and regional level, road user involvement is generally established through road boards, which have now been established in the Central African Republic and in Chad. The Cameroon and Gabon Governments are now considering the concept of a road board with management functions and direct representation from the road users.

## **Recommendations on the role of UDEAC in road sector development**

### **The role of UDEAC**

One of the key functions of UDEAC has been to work for regional integration in the transport sector. And because international transport plays a major role in trade facilitation, UDEAC has, a vital role to play in more effective road transport in the region, especially in the following areas.

#### *Harmonization*

Infrastructure services require reliable transport routes for imports and exports. The two landlocked countries in the region, as well as Democratic Republic of Congo have extremely high costs for their freight. Transport represents a major share of the cost of vital commodities, considerably affecting their economies. Neighboring countries provide access to the sea and transit routes for road traffic. This situation naturally leads to a number of common transport policy issues that need to be discussed in a common forum and coordinated by a supranational body. UDEAC has already identified improved interconnecting regional roads as a major objective.

#### *Enforcement of legal axle load limits*

Lorries and trailers have axle loads far in excess of the legal limit, and axle loads of more than 20 tons have been recorded. Although road agencies operate some weigh-bridges, it is only a token effort in view of the scale of the problem; and overloading is a serious threat to the major road network in the region. If allowed to continue, it may cause damage to new roads and to roads that have been rehabilitated at great costs. Regular maintenance may help to extend the life of pavements, but cannot prevent premature pavement failures caused by excessive axle loads. At the Abidjan seminar, representatives of the trucking industry voiced their concern about restrictions to free vehicle movement caused by unnecessary bureaucracy at border crossings and frequent road blocks on international through routes. Truckers confirmed their acceptance of the fee-for-service concept, and that they have a common cause with the road agencies in preserving roads: good roads save money for the truckers and the industry. However, truckers also argued that delay caused by frequent, and sometimes unofficial checks represent an even greater constraint to economic road transport than poor roads. Full cooperation from the trucking industry would depend on actions from governments to facilitate free movement of transports. UDEAC should continue efforts to harmonize standards for heavy goods vehicles and facilitate easier movements across borders in the

region.

Enforcement of legal axle load limits needs a regional coordination because many of the member countries do not define clearly who is responsible for implementation. The agency with the strongest incentive to enforce the regulations is probably the main road agency, but even it may be forced to back off in the face of the hostility sometimes encountered from the road transport industry. Road agency success in enforcing axle load limits has demonstrated the merit of telling truckers about their role as major stakeholders and the direct benefits of good roads. Through continuous dialogue with representatives of the transport industry, UDEAC could play a vital role in winning the support of the truckers for stricter enforcement of axle load limits.

#### *Road user charges*

Direct road user fees collected in 1997 in the whole region was less than one tenth of the maintenance requirement for main roads. All eight UDEAC countries collected less in total road user charges than estimated maintenance requirements for main roads. Road user charges must be reviewed in order to correct the overall imbalance between collected charges and required expenditures. Charging instruments must be designed to provide a better balance between road costs attributable to trucks and their current taxation. User charges are currently not collected effectively nor in a way that ensures road users pay for the damage and correspondingly the cost of repair. The UDEAC organization should be well placed to address the issue of more effective and equitable road user charges in the region.

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### 3. The Road Sector in the UDEAC Region

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*This chapter presents information about the road sector in each of the eight UDEAC countries. The format is much the same as used in the previous studies from SADC, COMESA, and ECOWAS regions.*

*In most countries, the standards for data collection, storing and dissemination of data from the road sector is generally low, although the situation varies from country to country. This is understandable in light of the basic problems of under funding and lack of resources in the sector. Still, data handling needs improvement.*

#### Cameroon

##### Country Profile

Cameroon is Africa in miniature. It has mountains, volcanic highlands, coastal plains, jungle rivers, rain forest, and savanna.

<b>Population:</b>	13.3 million
<b>Surface Area:</b>	475,442 square kilometers
<b>GDP (US\$):</b>	8.645 billion

##### Economy:

Origins of the gross domestic product for 1997 were, approximately:

<i>Agriculture</i>	25 percent
<i>Industry</i>	34 percent
<i>Services</i>	41 percent

Since the 1970s exploitation of natural resources has generated funds for investments in all sectors, with the transport sector receiving a lion's share. Cameroon enjoyed a road construction boom between 1978 and 1986, when a reduction in petroleum production and a fall in prices of cash crops created a difficult economic situation. The total GDP fell from about US\$13.2 billion in 1991, to about US\$8.6 billion in 1996. The GDP per capita fell in the same period from about US\$1,159 to about US\$650 in 1997.

Oil production accounted for about 45 percent of the government's revenues and was a major factor in the high economic growth in the 1970s and until 1985. Living standards started to deteriorate in 1986, and per capita income declined by 55 percent between 1986 and 1993. The devaluation of the CFAF in 1994 and the implementation of the Central Africa Customs and Economic Union (UDEAC) tax and tariff reforms have helped to reverse the trend.

An international workshop on poverty in Cameroon in 1994 identified improvement of transport infrastructure as a priority action. One survey found that in some areas of the

country as much as 86 percent of people interviewed thought that poor transport was the major cause of poverty. Many of the problems of the poor were compounded by the limited or non-existent road infrastructure, which cut off many villages and made some inaccessible for up to four months during the rainy season.

### Vehicle fleet

The size of the vehicle fleet is based on data that goes back to 1994:

**Table 3.1. Cameroon's vehicle fleet 1997**  
(numbers)

Vehicle Type	Number (1997)
Cars	83,300
Light commercial vehicles	16,000
Minibuses	
Large Buses	4,600
Trucks	10,500
Tractor- semitrailers	3,000
Trailers	3,000
Others	
Motorcycles	39,500
Total Vehicle Fleet (Excluding motorcycles)	125,400

Source: Ministry of Transport

### Traffic

The following traffic flows, recorded on some major roads in 1996, give an indication on the level of traffic:

#### *Traffic AADT*

Nanga Eboko–Bouam road:	139
Garoua Boulai–Meiganga	68
Meiganga–Ngaoundere	130
Batouri–Ngoura	47
Bamenda–Belifang	229
Garoua–Maroua	599
Douala–Edea–Pouma	2975
Kekem–Bandjourn	1650

### Traffic safety

Cameroon has a poor road safety situation, with about 906 persons killed on roads each year. The fatality per vehicle rate is correspondingly high with about 72 persons killed per 10,000 vehicles per year. Travel at night on rural highways is particularly dangerous because of large logging trucks and buses traveling at high speed.

### Road lengths and classification

Cameroon's road network comprises about 50,308 kilometers. There has been no clear functional or administrative classification of the network. The administrative classification available lists the road network into the following hierarchy:

National Roads	7,241 km
Provincial Roads	5,841 km
Departmental Roads	8,075 km
Rural Service Roads	11,539 km

The road lengths given in Table 3.2 are estimates made for this study. The length of main roads includes national roads and most important provincial roads.

The paved road network has expanded steadily over the last decades, from about 1082 kilometers in 1970, to 2682 kilometers in 1981 and to about 4036 kilometers in 1997, excluding the urban roads.

**Table 3.2. Road lengths**

Road Type	Length, kilometers
Main Roads	12 736
Rural Roads	19 039
Other Roads	17 073
Urban Roads	1 460
Total	50 308

The government has selected about 14,000 kilometers as a priority network, adjusted to the present management and financing capacity for road maintenance. The priority network includes all paved roads (4,036 kilometers) and about 10,000 kilometers of earth roads of economic and social importance.

Although Cameroon has a relatively large road network—106 kilometers per 1000 square kilometers—the sparsely populated areas in the south and east are not adequately covered. Cameroon has the next highest GNP per capita of the UDEAC countries, with about US\$650 per capita. This is also reflected in the relative maintenance burden for road users, in that Cameroon has about 401 kilometers of roads per one thousand vehicles and about 6 kilometers of road per million GNP.

### Road conditions

The general knowledge of the status of the road network is not good. The road inventory is not regularly updated and road conditions surveys are carried out only ad hoc. Road condition data below are based on a survey carried out by MINT in 1995, funded by GTZ. The paved road network has remained in generally fair condition because it is relatively recent and until 1992 has benefited from external funding of maintenance. Less than one third of the paved network was reported in good condition in 1997, which shows that paved roads have started to deteriorate. Only 11 percent of the unpaved main roads are in good condition and more than half are in poor condition.

**Table 3.3. Road network conditions, 1997**  
(kilometers/ percent)

Road Network Conditions	Paved				Unpaved				Total Km
	Tot. km	% Good	% Fair	% Poor	Tot. km	% Good	% Fair	% Poor	
Main Roads	4 036	32	35	33	8 700	11	38	51	12 736
Urban Roads	1 460	27	42	31					1 460
Rural Roads					19 039	13	70	17	19 039
Other Roads					17 073				17 073
<b>Total km</b>	<b>5 496</b>				<b>44 812</b>				<b>50 308</b>

Source: Ministry of Public Works, 1998

### **Institutional arrangements**

Two sector ministries have been involved in the management of the road sector: the Ministry of Public Works (MINTP) and the Ministry of Transport (MINT). MINT's main role has been to oversee a number of Public Enterprises (PEs) in the sector, but has also initiated and supervised regulations for road, rail, air, and transit maritime transport. Two PEs fall under the jurisdiction of MINTP: the equipment pool for road maintenance (MATGENIE) with about 400 employees, and the road laboratory with about 4,440 employees, which controls the norms and standards of road and building construction, and carries out research. The Department of Highway Maintenance in MINTP has been responsible for maintenance of primary roads. The poor condition of the rural infrastructure is partly because of a lack of coordination in the sector. In the recent past, thousands of kilometers of rural roads were constructed as part of rural development, agricultural projects, and other schemes without considering the maintenance requirements after construction. About 12,500 kilometers of rural roads are the responsibility of MINTP. Although MINTP's budgets have included some funds for rural infrastructure, the primary road network has traditionally been the priority, and almost no maintenance has been carried out on rural roads. Maintenance of the remaining rural roads are mostly the responsibility of local governments and communities, and agricultural development companies. Local communities have a weak fiscal basis and no resources to maintain rural roads and were, in fact, rarely involved in the decision to build the roads in the first place.

The government is now committed to restructuring road sector management by separating policy and planning functions from production activities, and by ensuring private sector participation in management. Maintenance funds will be allocated to a priority network comprising all paved roads—about 9,000 kilometers of the most important earth roads and about 10 000 kilometers of rural roads, selected on economic and social criteria. The changed policy also means that road maintenance will be carried out more often on contracts, and less by force account.

### **Staffing**

The road network is managed by the Ministry of Public Works (MINTP). Road agency staff total about 4,992, comprising 665 engineers and managers, 977 technicians and 3,350 unskilled workers. Salaries of engineers are about US \$300 per month, or about one third of the salary in the private sector for similar jobs.

### **Road maintenance activities**

During the last ten years, investments have been given priority, and road maintenance has been neglected. Because the government has been committed to paying salaries of employees it has not been able to fund maintenance. Low maintenance productivity has been caused by inefficient

management, non-performing force account teams, and a lack of equipment and financing. The maintenance program now proposed for the years up to 2000 has been based on a study of need of rehabilitation, periodic maintenance, and routine maintenance for the whole road network. For each maintenance intervention, there will be a progressive participation of private contractors.

### **Equipment**

Parc National de Materiel de Genie Civil (MATGENIE) (Equipment Pool), a parastatal under the jurisdiction of MINTP, has been responsible for equipment management. MATGENIE faced a liquidity crisis for several years in the middle of the 1990s. Salaries were not paid in time and staff morale was low. Availability of equipment for force account operations was very low. The company was subsequently restructured in 1994 with a new administrative chart, and the number of staff was reduced by about the half.

### **Contracting**

The expansion and upgrading of the road network during the last decade was mainly by the use of subsidiaries of foreign contractors, based in Cameroon. Truly local contractors have found it difficult to enter the road construction market. There are a number of reasons for this, including the fact that small contracts typical of road maintenance have not been tendered but carried out by provincial road services on a force account basis. There is now a changed attitude by the government to encourage local SMEs. However, constraints still exist, such as complicated laws and regulations, high taxation rates, and difficulties in obtaining bank credits. A reliable flow of funds is most important for promoting local contracting, which has been prevented by frequent budget cuts and poor payment practices. The government intends to move away from maintenance by force account. Most of periodic maintenance is now carried out by private contractors, and routine maintenance as well will increasingly be carried out by contracts. Force account operations will only be retained for emergency work.

### **Financing**

Funds for road maintenance diminished towards the end of the 1980s, and the problem of the roads were compounded by poor management of maintenance activities, which were based essentially on use of force account brigades. There have been serious problems in managing the roads, particularly in relation to parastatals responsible for maintenance.

Although the government has acknowledged that road maintenance is of high priority, it has in the recent past been unable to make the necessary resources available. In 1985–86, about US\$100 million were allocated to the road sub-sector for routine and periodic maintenance and opening of some feeder roads, but excluding salaries of MINTP staff. By 1991 the allocation was reduced to about US\$27 million and the following year dropped to US\$10 million. The total fiscal revenues collected from the transport sector were at the same time estimated at US\$130 million. In 1997, about US\$37 million was spent on maintenance. More than 90 percent of total allocation was used on main roads.

The Cameroon government has introduced a wide range of taxes to operate in the road sector. Taxes linked to *ownership of vehicles* include entry taxes, vehicle tax, axle load fees and driving license stamp. Taxes linked to *vehicle use* include tax on petroleum products (customs duty, turnover tax, and a special tax on hydrocarbons) and road toll. A toll system has been installed on the main paved roads, amounting to about US\$1 per vehicle passage, regardless of vehicle type. Toll gates on Cameroon main roads became operational in September 1993. During financial year 1993–94 a total of CFA 980 million was collected, and the next year about CFA 2 billion. In the beginning there were problems with corrupt toll gates officials, and the consequent considerable evasion of revenues. Since then the government has taken action against corruption.

It is difficult to control state borders if price levels for fuel differ too much. Smuggling is relatively easy along most borders of SSA countries. On the border between Nigeria and Benin, for instance, a small quantity of fuel may represent a relatively large value compared to the wage—that is, two jerry cans of fuel, bought in Nigeria and sold in Cameroon, might yield a profit of US\$20.

*Road maintenance requirements*

GTZ estimates the total value of road assets, excluding urban roads, to be around US\$3.3 billion. Based on this value of assets, GTZ estimates the total requirement to preserve the road assets to be about US\$95 million, or about US\$110 million including the urban road network.

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# Central African Republic (CAR)

## Country Profile

<b>Population:</b>	
<b>Surface Area:</b>	622,980 square kilometers
<b>GDP (US\$):</b>	1122 million

### Economy:

The origins of the gross domestic product for 1997 were:

<i>Agriculture</i>	42 percent
<i>Industry</i>	18 percent
<i>Services</i>	40 percent

The northern zone of the country forms part of the dry Sahelian savanna. The central part belongs to the wet savanna, whereas the southern areas are covered with dense tropical forests. CAR is landlocked by the Sahel countries Chad and Sudan in the north, by the Democratic Republic of Congo and Congo in the south, and Cameroon in the west. The shortest route to the sea by road is about 1,650 kilometers and goes to Douala in Cameroon. The country's main export commodities are diamonds, coffee, cotton, and wood.

### Vehicle fleet

The total vehicle fleet in 1997 is estimated at about 18,000. The number is based on an estimate of about 12,000 in 1988 and about 16,600 in 1991 and the number of vehicles imported in 1997, which was as follows.

**Table 3. 4. Vehicle import 1997**  
(numbers)

Cars	680
Pick-ups	213
Minibus	81
Bus	15
Trucks	133
Tractor-semitrailers	29
Trailers	37
Motorcycles	555
Others	7

About 80 percent of the vehicle fleet are light vehicles, of which 40 percent are pick-ups.

### Traffic

Traffic is influenced by import and export to and from neighboring Cameroon by road and by rail between Douala and Bangui. Transport on some 2,616 kilometers of navigable rivers complements road transport. International surface transport is divided between river transport to Brazzaville (Congo) and from there by rail to Point Noire (1,850 kilometers) and road transport to Douala in Cameroon (1,650 kilometers). The transport demand is relatively modest, as can be seen from Table 3.5. Total import/export traffic declined from about

312,000 tons in 1984 to 160,500 in 1994. The distribution of transport between river and roads in 1994 was as follows:

**Table 3. 5. Import and export volumes in 1994**  
(tons)

Mode	Imports (tons)	Exports (tons)	Total (tons)
By road	68,200	34,800	103,000
By river	56,700	800	57,500
Total	12,4900	35,600	160,500

The national and regional road network carries 80 percent of total road traffic, of which half is on the short sections of paved roads. Traffic density is highest near Bangui and decreases considerably with distances from the capital. Daily traffic on paved roads ranges between 120 to 150 vehicles per day and in Bangui reaches about 3,500 vehicles per day. Average daily traffic on national roads varies typically between 50 and 100 vehicles per day, whereas traffic on regional roads varies between 15 and 50 vehicles per day and even much lower in some remote areas. Traffic has generally stagnated or declined during the 1990s.

#### **Traffic safety**

CAR has a poor road safety standard and high accident level, relative to the number of vehicles. Forty-nine persons were registered as killed on roads in 1997. This gives a fatality rate of about 27 persons killed per 10,000 vehicles. However, there are indications that the number of persons killed is underestimated. Information from the village police has not been furnished to the Directorate of Surface Transport, and probably not included in the number of persons killed. The high accident level is due to poor driver behavior, lack of enforcement of traffic rules, poorly equipped and insufficiently trained police, and the absence of traffic signs and signals.

The RSP included a component to initiate improvements of the traffic safety situation. The Road Fund had earmarked 1 percent of its budget to support the road safety budget, but these funds were never allocated. In addition, staff trained under the program were moved to other ministries.

#### **Road lengths and classification**

The road network of CAR totals about 24,000 kilometers; comprising 9,000 kilometers of classified national roads and regional roads and 15,268 kilometers of rural access roads. The spatial density of roads is about 37 kilometers per 1000 square kilometers, and among the lowest in SSA. However, the relative maintenance burden on road users is high because of sparse populations and a small vehicle fleet: 21 kilometers of roads to maintain per million of GDP and 1,292 kilometers of road per 1,000 vehicles.

In order to prioritize maintenance, the national and regional road network has been divided into 4,000 kilometers of priority roads and 5,000 kilometers of secondary.

The paved road network is relatively limited, with a total of 589 kilometers of paved roads, including the 139 kilometers section between Bossembele and Bossemtele, completed in 1998.

**Table 3. 6. CAR's classified road network**  
(kilometres)

Road Type	Length, km
National Road	5,333
Regional Roads	3,909
Rural Roads	14,022
Total	23 264

## Road conditions

**Table 3.7. Road network conditions, 1997**  
(kilometres/ percent)

Road Network Conditions	Paved				Unpaved				Total Km
	Tot. km	% Good	% Fair	% Poor	Tot. km	% Good	% Fair	% Poor	
Main Roads	585	100			4,748	50	40	10	4,748
Regional Roads					3,909				3,909
Rural Roads					14,022				14,022
Other Roads									
<b>Total km</b>	585				22,679				23,264

Source: DGTP, Bangui, 1998

## Institutional Arrangements

A new law of 1995 defined the organization and functions of the Ministry of Public Works, Environment and Development (MTPAT):

### *Regulatory functions*

MTPAT should be responsible for (a) studies and initiating and managing all activities relevant to the departments of the ministry; (b) promoting the development of road infrastructure in the country; (c) planning the rehabilitation of roads and maintenance of the road network; (c) having overall responsibility for the sector and coordinating environmental issues with other sector interests.

### *Executive functions*

MTPAT is responsible for (a) preparing annual road maintenance budgets and controlling funds allocated to the various interventions; (b) developing human resources to ensure capability of personnel in the sector; (c) ensuring regional coordination of budgeting and works execution; (d) ensuring efficient management of resources; (e) participating in bilateral and multilateral negotiations. The ministry is mandated to take decisions in relation to sector issues and to represent the government and delegate authority.

The Implementation Completion Report from the WB/Transport Sector Project was critical to the progress made in institutional systems. Little progress had been made in improving government procurement procedures, and the decision-making process in the ministries of the sector remained highly centralized.

## Staffing

Management	88 persons
Engineers/Technicians	207 persons
Others	46

## Road maintenance activities

Road maintenance has been inadequate for a number of years, despite considerable external assistance. Consequently, following the substantial investments made during the rehabilitation program of 1982–1986, the road network has begun to deteriorate again. The government has initiated studies to reduce the effect of the land-locked position of the country. The first phase of the transport sector project was completed in 1996. A second phase is being discussed with the European Union, and would eventually have the following objective:

- improve sector institutions
- improve planning criteria for sound investments
- improve planning and management of road maintenance, including use of private sector resources for production
- focus on regional cooperation for international road transport
- liberalize the transport sector
- reduce the social costs of road transport with focus on traffic safety and environmental problems.

## Equipment

*La Direction du Materiel des Travaux Public (DMTP)* is responsible for management and upkeep of all plant and equipment for force account operations. The Directorate is in charge of a workshop for heavy vehicles and engine overhaul, and for the purchase of materials for public works. The DMTP also has workshop facilities for pump overhauls, repair of electrical equipment, and for storing of spare parts and plants. DMTP holds a considerable amount of equipment, mostly provided by Japan on a grant basis. About 300 items of equipment with an estimated replacement value of US\$ 28 million were registered at the beginning of the 1990s. Availability and use of equipment by force account operations have generally been poor. The reasons for the weak performance of DMTP have been cited to be unqualified mechanical engineers and technicians, inadequate spare parts and funding, and inappropriate programming of equipment use. Presently, there is no private equipment pool, which is the reason why, for the time being, the government has opted to rely on the public plant pool.

## Contracting

Four local contractors have been pre-qualified and engaged for maintaining unpaved roads and some bridges on roads ranging from 97 to 248 kilometers. Three small and medium-sized contractors (SMEs) have been commissioned for individual contracts. Three to four expatriate contractors have been engaged for road rehabilitation.

About four local consultants have been preparing the documents for contracts. About five expatriate consultants have been assigned, depending on how much of the work requires special expertise, such as studies financed by foreign sources. The government's objective was that 70 percent of maintenance work should be carried out by local contractors by the end of 1996. However, only about one quarter of maintenance work was actually done by local contractors. The slow implementation of the government's maintenance strategy was due in part to shortage of qualified local contractors, and an apparent reluctance by the ministry to lease equipment to local contractors. Despite the domestic problems encountered in 1996 and the middle of 1997, the change to

contracting has taken root. During 1997 about half of the maintenance work was carried out by contracts after open bids. The other half was carried out by the mechanized force account brigades of the ministry.

### **Works methods**

The DMTP was officially started in September 1989. The value of plant was about 3.5 billion FCFA, supplied mostly from bilateral donors, such as Japan.

In the beginning of the 1990s it became clear that the private sector had to be involved in the production of maintenance and rehabilitation work. This also conformed to the general policy of the government, to disengage the public from road maintenance activities.

In the future, when DMTP takes on the role of policy, management and control, the public plant pools will eventually be privatized. Presently, the equipment management is going through a phase of increasing commercialization, based on negotiations with the government institutions involved.

DMTP employs about 300 persons, of which half deal with road maintenance, while the other half are plant operators and drivers. The required number of personnel is estimated to be about 200. With a view to the future privatization of activities, an evaluation of the staffing need is being carried out to reduce the amount of overstaffing and retain a minimum staff level.

The *Laboratoire National des Bâtiments et des Travaux Publics (LNBTP)* has a staff of about 30 people. It is well equipped and capable of carrying out normal soil testing and material control on road jobs. New equipment was purchased in 1997 for a sum of about US\$350,000. The LNBTP is a member of the Association of African Laboratories and takes part in bids for soil testing jobs etc. in the region. In accordance with the status of the Road Fund, the fund should allocate 2 percent of the revenues for financing of studies and geo-technical control work that the laboratory performs. The laboratory's functions include project management of studies and preparation of contract documents, documentation of knowledge about soil and material properties of the region, and review and update of manuals and specifications.

### *Axle load control*

Axle loads are controlled at the weighing station near Bangui. The payment of fines has not been enforced for some time, which has encouraged heavy overloading and consequently damaged the road network. When police tried to reintroduce road blocks and levies for overloading in 1996, they came under heavy pressure from the truckers. Regulations were subsequently not enforced or enforcement was waived under the pressure of truckers, when both the political will and the capacity were missing. The axle load situation in CAR remains highly unsatisfactory.

### **Financing**

The present Road Fund was established in 1981 with the main objective of financing road maintenance. It was modified and amended in 1991 and again in 1995 by Presidential Decree No. 95200. The Road Fund gradually developed from a "special account" in the 1960s and 1970s, maintained at the Ministry of Finance and funded through the general budget, to the legally and financially autonomous public institution created in 1981. The "special account" mechanism of the national budget failed to provide timely and adequate financing of road maintenance. All members of the present supervisory board come from the public sector. About 96 percent of the revenue comes from a levy on fuel. Therefore, the Road Fund depends on the financial health of *Centrafricaine des Pétroles (PETROCA)*, which is supposed to pay accruals into the Road Fund. And the efficiency of the Road Fund is again directly affecting the institutions responsible for road maintenance.

The direct transfers from PETROCA of the users fee contained in the fuel tax, increased in nominal terms from CFAF 1.0 billion in 1982 to CFAF 1.7 billion in 1988. In 1994 the total revenue of the fund was about US\$4.54 million. Overhead costs to cover administration of the fund were as much as 20 percent of total expenditure, which covered the following expenditure items:

	<u>US\$ million</u>
Routine maintenance by force account	0.33
Periodic maintenance by force account	2.07
Routine maintenance by contracts	0.26
Periodic maintenance by contracts	0.41
Overhead costs	0.78
TOTAL	3.85

The biggest problem now is the non-payment to the road fund by PETROCA. An accumulation of arrears is holding back funds that should have been used for road maintenance in accordance with plans agreed to with the Transport Sector Program.

The finance law of 1998 enables toll roads to be used as a means of financing road maintenance, as an addition to the Road Fund. A delegation visited neighboring countries this year to review the experiences there. The Road Fund depends on road user fees, which represents about 90 percent of its revenue. With the present irregularities of payments into the fund, comprehensive road maintenance programs are not feasible. The present mismanagement of the road fund affects the DMTP, which is not able to commission contracts as scheduled, nor manage agreements already entered into. The maintenance of paved roads has been financed from FED and from Japan. Unpaved roads have been financed from WB, the Road Fund, and from FED. Since the first Transport Sector Project, the limited resources of the Road Fund has been instrumental for most of the maintenance interventions on unpaved roads. In 1997 about 61.000 million FCFA was used for periodic maintenance on paved roads. About 9.000 million FCFA was used for routine maintenance of unpaved roads (Road Fund) and about 11.000 million FCFA on periodic maintenance.

#### **Cost recovery versus road maintenance requirements**

GTZ estimated in a study in 1996 that the asset value of the road network was about US\$1.1 billion and the conservation cost about US\$38 million per year. GTZ estimated the conservation cost of national roads only to be about US\$ 23.5 million per year. GTZ estimates that the total revenues generated by the road sector amount to about US\$18 million per annum. The consultant's estimate of maintenance requirements (not including rehabilitation) is about US\$26 million, based on the average maintenance costs used in the HDMIII model. In addition to the Road Fund user fee, several other taxes, sales taxes on spare parts, and import duties constitute the framework for cost recovery of road rehabilitation and maintenance. The smuggling of fuel from neighboring countries was a problem of cost recovery in the past, but has been considerably reduced since the devaluation of the FCFA in 1994.

#### **Road user organizations**

There are at least three road user organizations active in the sector. One is the *Union Syndicale des Conducteurs de Centrafrique en abrégé (USCC)*. It has about 1200 members, located in six different regional offices, including Bangui. Another organization is the *Groupement des Transporteurs Centrafricains en abrégé (GTC)*, with members from small and large transporters. Founded back in 1954, GTC is now facing problems because of the aging transport fleet of its members. A project including financing of 80 new vehicles and a study to reorganize the organization is being funded by France. A third road user organization is the *Syndicat des*

*Conducteurs et Receveurs de Taxi et Bus en abrégé (SCRTB)*, mainly looking after the interests of drivers and attendants of buses and taxis.

**References**

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GTZ, 1996. *Financing Road Maintenance*. Eschborn, Germany.

# Chad

## Country profile

Population:	6.4 million
Surface Area:	1,284,000 square kilometers
GDP (US\$):	1.15 billion

## Economy

Most of the land area of Chad is desert. A quarter of the area in the south of the country has annual rainfalls in excess of 800 millimeters, which provide good conditions for agriculture. Oil has been discovered in the northwest of Lake Chad and in the Doba region in the south. A road construction project is planned to improve infrastructure for exploitation, opening a new link by road to neighboring Cameroon. A new pipeline across Cameroon is also planned.

Origins of the gross domestic product for 1997 were :

<i>Agriculture</i>	40 percent
<i>Industry</i>	20 percent
<i>Services</i>	40 percent

Economic development has been one of successive promising starts stopped by serious internal and external blows. Recurring political instability and domestic strife, which erupted into civil war from 1979 to 1983, have been the most serious constraints to development. The country has also been severely hit by drought.

Chad is a vast country with only 5 people per square kilometer of land area. It is relatively well endowed with natural resources for agricultural production, especially in the south, where much of the population is concentrated. The economy is based on agriculture, which generates 40 percent of GDP and provides a livelihood for more than 80 percent of the population. Livestock and cotton constitute the most important sources of cash income for the rural population and account for three quarters of the export earnings.

## Vehicle fleet

The size of the vehicle fleet is based on data that goes back to 1994:

**Table 3.8. Chad's vehicle fleet, 1997**  
(numbers)

Vehicle Fleet Types	Numbers 1997
Cars	10,105
Light commercial vehicles	12,217
Minibuses	966
Buses (Camions)	4,079
Trucks	1,913
Tractor- semitrailers	1,526
Trailers	700
Others	
Motorcycles	21,934
Total Vehicle Fleet (Excluding motorcycles)	53,520

Source: Country Report

## Traffic

The main transport problem stems from the country's landlocked position. The main link to the outside world is by the rail connection from Ndjemena to Douala in Cameroon. Chad has the lowest density of vehicle ownership in UDEAC, with about 21 vehicles per 10,000 people. This is an increase from about 11 in 1989. The traffic on paved roads ranges from 150 to 200 vehicles per day, while on engineered earth roads the average is 50 vehicles per day. Traffic increased heavily in the beginning of 1990s, with an annual growth rate of 25 percent, in step with the improved economy and increased car ownership. Domestic freight transport by road is about 330,000 tons per year.

The traffic levels on some roads in 1997:

N'Djemena–South to Guelendang	109 vehicles per day
N'Djemena–North to Djerma	47 vehicles per day
N'Djemena to Cameroon border	34 vehicles per day

### *Traffic safety*

Statistics from recent years are not available; however, based on figures from previous years it is believed that about 150 people are killed each year in road traffic accidents.

## Road lengths and classification

Chad is a vast country. With a surface area of 1,284,000 square kilometers, the country has a total road length of about 30,000 kilometers, of which 7,000 kilometers are classified roads. It has a spatial density of roads of about 22 kilometers of roads per 1000 square kilometer, or about the same as CAR. The maintenance burden for road users is relatively high, with 911 kilometers of road for 1000 vehicles, or nearly one kilometer per each vehicle. In relation to the global economy, the road network represents 25 kilometers per one million of GDP. This translates to an annual maintenance requirement of about US\$911 for each vehicle in the country. The central government is formally responsible for maintenance of these roads and another 23,000 kilometers of tracks. Following the country's domestic problems in 1979, the road network was completely neglected and the whole transport sector is in disarray. An emergency program to restore the road network was started in 1983 with the help of the international donor community. The emergency program was followed by the so called *Programme d'Adjustement Sectoriel des Transports (PASET)* from 1988 to 1993. A second transport sector program was started in 1994. During that program, part of the road network was selected as the first priority for maintenance allocations.

By the year 2000 there will be about 650 kilometers of paved roads, 3538 kilometers of rehabilitated unpaved roads, and 479 kilometers of unpaved roads not rehabilitated.

The road network has been classified into two classes for purpose of maintenance prioritization:

### *First Priority Road Network (RRPP)*

- Paved roads 263 km
- Earth roads 2563 km

### *Second Priority Road Network (RRPS)*

- Paved roads 24 km
- Earth roads 1853 km

The priority road network is defined as the minimum length of roads that may provide adequate links between N'Djamena and major domestic centers of economic activity, and between Chad and

neighboring countries. (For the sake of comparison in the present study, both First and Second Priority Roads have been included in the category of "Main Roads").

The following roads have been constructed or rehabilitated since 1989:

*Paved roads:*

Guelendeng-N'Djemena-Djermaya-Dandi	263 km
Guelendeng-Bongor-Ere	165 km
Karal-Dandi-Guite	24 km
Total	452 km

*Earth roads:*

Total	683 km
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**Road conditions**

The road network suffered badly from many years of neglected maintenance during the late 1970s and early 1980s. The table below shows the conditions of the road network in 1997.

**Table 3.9. Road network conditions, 1997**

(kilometers/ percent)

Road Network Conditions	Paved				Unpaved				Total Km
	Tot. km	% Good	% Fair	% Poor	Tot. km	% Good	% Fair	% Poor	
Main Roads	287	61	39		4417	31	26	43	4704
Urban Roads									
Rural Roads									
Other Roads									
<b>Total km</b>	287				4417				4704

Source: Ministry of Public Works, 1998

**Institutional arrangements**

The role and functions of each authority are set out in a regulation of 1997 regarding the reorganization of the Ministry of Public Works, Transport, Environment and Urban Affairs. At the central level the Directorate of Roads is responsible for planning, programming and control of execution of road construction and maintenance. Six regional offices are charged with control of expenditure and technical quality throughout the country.

The policy to privatize operations in the road sector was accepted in 1988, with the role of the ministry focusing on regulatory functions, and a considerable reduction of staff.

The Ministry of Public Works and Transport was created in 1991 by combining the ministry of public works and the ministry of transport and civil aviation. The organization of the road sector was further defined in *Décret* number 392/97 of the President of Chad. The Director General is responsible for the Directorate of Roads and assisted by one Director General (Works) and a Director General (Construction). The functions of the main departments are as follows:

PLANNING DEPARTMENT: coordinates with other sectors and adheres to government sector policies; reviews strategies and plans to conform with macro-economic goals; prepares evaluation reports of programs for the Minister; updates sector statistics.

ROADS DEPARTMENT: responsible for: strategic planning, planning and design of roads construction and maintenance; research; long- and medium-term plans for road development and maintenance; road conditions and appropriate regulations for signaling and road safety.

TRANSPORT DEPARTMENT: formulates government policies in the transport sector in line with international laws and conventions; promotes contract capacity etc., and promotes road traffic safety at the national level.

Other departments include; the Civil Aviation Department, the Building Department, the Urban Affairs Department, the Environment Department and the External Services Department.

The LBTP, SNER and *Ecole Nationale des Travaux Publics* (ENTP) are under the MTP.

Directly under the minister is an inspector general with a mandate to control the quality and efficiency of the services. The inspector general has access to all documents and files in connection with the services, and may be assisted by personnel from other administrations.

### **Annual report**

A local consultant prepared the annual report on the road sector for 1997. It included a revue of achievements compared with budgets and plans. Some of the critical points noted were:

- lack of attention to environmental issues
- insufficient revenues to CAER
- delay in maintenance of earth roads and agricultural roads
- poor contract management.

Some of the positive notes were:

- good studies
- more contracts with local contractors signed than planned
- rehabilitation contracts completed without delay
- funds concentrated on maintenance.

The report noted that the regional offices have not yet been fully operational and have problems with discharging all their responsibilities. The problems are associated with lack of experience of the principal cadres, and the de-motivation of staff due to insufficient and erratic payments, and also due to the management's lack of attention due to pressure of work from outside.

The SNER, because of its many functions, has reportedly not totally come to grasp with its role as client of public service, although the Department has been keen to demonstrate its ability to provide better and cheaper road maintenance.

The role of the *Compte autonome d'Entretien Routier* (CAER) is emphasized in the report, because it finances work that normally would have been funded under the investment budget. The report notes that as much as 57 percent of contracts were paid to local contractors and 43 percent to international contractors. On the technical side, the maintenance staff is faced with a problem impossible to solve: the resources available are too small for sustainable results. It is also clear that the road structures are too weak to ensure lasting results of routine and periodic maintenance.

### **OFNAR and SNER**

*Office National des Routes* (OFNAR) was responsible for road maintenance in the past. Between 1984 and 1994, it went through a process of commercialization and was reorganized in 1989 as a

public establishment with a legal personality and financial autonomy, under the direction of MTP. With a view to its privatization, the personnel holding was reduced from 1,100 to 600 and restructured in 1993. OFNAR ceased its activities and the *Société Nationale d'Entretien Routier (SNER)* was created. SNER was a mixed corporation with 98 percent of its capital held by the State. OFNAR's equipment was transferred to SNER at a residual value of about US\$4 million, repayable to the state (CAER) in three years. SNER has a staff of about 414, including two expatriate professionals. In 1995, half of all routine maintenance works were allocated to SNER on a sole source basis, while bids were sought on the other half, for which SNER could not bid. SNER has already obtained several contracts for periodic maintenance work through competition. The intention is to open the company's capital to private shareholders.

### **Laboratory**

MTP operates a road laboratory, *Laboratoire National du Bâtiment et des Travaux Publics (LNBTP)*. Its three main functions are: (a) soils and materials studies for roads and bridges; (b) quality control of materials and construction; (c) help collect and disseminate general knowledge about the road network.

In the beginning of January 1993 the laboratory staff consisted of four engineers, five technicians, thirteen skilled technical staff and eight administrative staff. The laboratory has done work for a number of public and private clients, among them large international consulting firms. Since 1996 the LNBTP has been operated as a private concession. The agreement between Ministry of Works and a group of affiliated architects and engineers (ASD) runs for five years. ASD is committed to maintaining a staff qualified to carry out all the tasks of the laboratory.

### **Staffing**

#### Salaries

Engineer	US\$1000
Technician	US\$400
Qualified workers	US\$200

### **Road maintenance activities**

To help the local population with employment opportunities, workers from the location are given preference for temporary positions. Implementation of road projects under the Public Works and Capacity Building Project emphasizes labor-intensive public works. This project is being implemented by the *Agence Tchadienne d'Execution des Travaux d'Internet Public (ATETIP)*, an organization created January 5, 1995 and based on the same project management model already in place in Benin, Burkina Faso, Gambia, Mali, Mauritania, Niger, and Senegal. ATETIP is a non profit organization whose General Assembly includes representatives of NGOs in Chad.

### **Equipment**

There is presently no public plant pool in Chad.

### **Contracting**

Three local firms have pre-qualified for road maintenance: *Entreprise Tchadienne de Travaux Publics (ETTP)*, *Société Nationale d'Entretien Routier (SNER)* and *Génie Routier Tchadien (GER)*.

Most believe that the private sector in Chad has the capacity to take on a whole range of work. More than 50 contracting firms exist in the formal sector, divided into three groups: The first includes five large international firms; the second involves 14 national enterprises managed by expatriates; and the third includes some 36 national firms managed by local staff. Two local

consulting firms were established recently to work in the transport sector; *Bureau d'Etudes Africain des Travaux Publics (BEATP)* and *Ingénierie et Technique (INDETC)*. Several foreign consultants have been engaged to carry out strategic studies, financial studies and to design and supervise major work.

### **Financing**

Chad has established a Road Fund called *Compte Autonome d'Entretien Routier (CAER)*. The use of revenue from the fund is discussed in conjunction with budget proposals every year. The Director of Roads manages the Road Fund and is responsible for preparing budgets for routine and periodic maintenance, ferries, and maintenance studies. He is also responsible for commissioning and managing contracts for works executions, and preparing progress reports for approval by the Inter-ministerial Committee. The proposed budget is first reviewed by the Technical Committee, and then submitted to the Inter-ministerial Committee for final approval. The Secretary of CAER is placed directly under the Director General of Ministry of Works and Transport, and is appointed by the ministers of finance and works. An external auditor carries out annual audits of CAER accounts.

#### *Road maintenance requirements*

The level of maintenance financing depends on the performance of the CAER and on the mobilization of external sources for rehabilitation. The revenue of CAER was about 4.1 billion FCFA in 1997 and was expected to reach about 5.5 billion in 1998. The total road fund budget for 1996 included about US\$ 5.5 for road maintenance, of which about US\$ 1.1 is for routine maintenance of the 263 kilometers of paved roads.

GTZ has estimated road conservation cost to be about US\$13 million per year. The consultant's estimate of maintenance requirement (excluding rural roads) is about US\$ 10.7 million. Chad has imposed a strict priority for maintenance of roads. The road networks selected as first and second priority are considered a bare minimum. In connection to this, it should be noted that travel by car is possible in many areas without engineered roads in the dry season.

#### *Road user organizations*

There are two road user organizations in Chad. However, these organizations do not have the competence to participate in road maintenance management, which is in the hands of the public only.

### **References**

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*Country Report*

# Congo

## Country profile

<b>Population:</b>	2.6 million
<b>Surface Area:</b>	342 square kilometers
<b>GDP (US\$):</b>	1.76 billion

## Vehicle fleet

The size of the vehicle fleet is uncertain, as reliable statistics have been destroyed. The road authorities estimate that in 1997 the fleet totaled about 30,000, with the following composition:

**Table 3.10. Congo's vehicle fleet**  
(numbers)

Vehicle Type	Number (1997)
Cars	20,000
Light commercial vehicles	5,000
Minibuses	2,000
Large Buses	
Trucks	50
Tractor- semitrailers	
Trailers	
Others	
Motorcycles	
Total Vehicle Fleet (excluding motorcycles)	30,500

*Source: Office Congolaise de l'Entretien Routier (OCER), Brazzaville, 1998.*

## Traffic

A recent traffic study, carried out by French consultants in 1997, included an attempt to estimate the vehicle fleets in Brazzaville and Pointe Noir, the two main cities of Congo. The estimate was based on the number of vehicles travelling between these destinations, and was about 2,020 vehicles in Brazzaville and 825 in Pointe Noir. These figures indicate that the OCER figures for the total vehicle fleet are overestimated.

## Traffic safety

The OCER estimate that about 3,000 accidents occur on the roads of Congo each year, resulting in about 143 persons killed. Using the above estimate of 30,000 vehicles, the fatality rate is about 48 persons killed per 10,000 vehicles. The size of the vehicle fleet is probably overestimated, and hence the fatality rate even worse than 48.

## Road lengths and classification

**Table 3.11. Congo's classified road network**  
(kilometers)

Road Type	Length, km
Main Roads	8,270
Rural Roads	
Other Roads	
Urban Roads	
Total	8,270

## Road conditions

**Table 3.12. Road network conditions, 1997**  
(kilometers/ percent)

Road Network Conditions	Paved				Unpaved				Total Km
	Tot. km	% Good	% Fair	% Poor	Tot. km	% Good	% Fair	% Poor	
Main Roads	1,210	26	54	20	7,060	15	25	60	8,270
Urban Roads									
Rural Roads									
Other Roads									
<b>Total km</b>	1,210				7,060				8,270

Source: Office Congolaise de l'Entretien Routier (OCER), Brazzaville, 1998

No maintenance has been done during the last five years because of the disturbances in the country. The lengths of road listed as "main roads" in Table 3.12 represent the road network that OCER considers maintainable. In addition to these main roads, there are at least 10,000 kilometers of earth roads serving as rural access roads. The overall condition of this "secondary" network was termed "catastrophic" by the authorities interviewed.

### Staffing

OCER now has a staff of about 455, comprising 22 engineers, 33 technicians, and 400 unskilled workers.

An engineer salary in public service is about US\$250 per month, as compared to about US\$1,200 per month in the private sector for similar capabilities.

### Road maintenance activities

Because of the war, very little maintenance has been done in recent years.

### Equipment

Virtually no workable equipment exist.

### **Contracting**

A few local contractors have been established, working in closely with OCER. The government recognizes the importance of a local construction industry, and has declared its commitment to developing a cadre of competent small and medium-sized road maintenance contractors (SMEs). It has decided to rely more on local contractors for implementing maintenance contracts. However, the government realizes that it does not presently have the capacity to manage the procurement and control of such enterprises. It has therefore decided to follow the same model of contract management successfully adopted in some other African countries, such as Benin, Mauritania, Senegal, and Togo.

By Presidential Decree of April 1997, the government created a contract management agency, *l'Agence Congolaise d'Execution des Travaux d'Intérêt Public pour l'Emploi (ACETIPE)*, to manage building and public works contracts. The creation of ACETIPE includes at the same time an acceptance of a policy of road maintenance based on contracts and only minimum force account. ACETIPE has been established as a private entity on a non-profit basis. A contract delegating the responsibility and functions, was signed between the government and ACETIPE, represented by the Director, on April 25, 1998.

### **Financing**

A special account for maintenance, *Fonds Routier (FR)*, was established by Presidential Decree in 1994. It is based on a special tax on fuel, which for 1997 amounted to about US\$17 million. Forty percent of the total revenue from the special tax is allocated to the road fund. Of this, one third again is allocated directly to OCER, and the rest for rehabilitation and maintenance of roads.

### **Road Maintenance Requirements**

A total of about US\$20 million would be required per year to fully maintain the classified road network

### **References**

Mr. Phillippe NGANGA, July 1998, *Country Report for this Study*, Brazzaville, Congo

## Democratic Republic of Congo (DRC)

### Country profile

The Democratic Republic of Congo (DRC), formerly called Zaire, is the third largest country in Africa with a surface area of 2.3 million square kilometers. Its population is located around a large equatorial rain forest in the country's center, within which very few people live. Out of a population of 30 million, about 62 percent live in rural areas. With more than half of the population of the UDEAC region, DRC has a large agricultural potential, but presently a low yield. Producers of agricultural products remain isolated from potential consumers. Poor roads throughout the country limit the mobility of both labor and produce.

<b>Population:</b>	30 million
<b>Surface Area:</b>	2 345 000 square kilometres
<b>GDP (US\$):</b>	3.6 billion

### Economy:

Origins of the gross domestic product for 1997 were:

Agriculture	53 percent
Industry	21 percent
Services	26 percent

### Vehicle Fleet

The size of the vehicle fleet is uncertain. Estimated at about 180,000 in 1989 (WB), it has probably declined since then in pace with the deteriorating economy. Previous studies have indicated a close relation between economic performance and growth in vehicle fleet. For statistical comparison, a total of 150,000 vehicles were used as an estimate of vehicle fleet.

### Traffic

Currently, there is a low volume of traffic on most of the roads in the country. On rural access roads, the traffic rarely exceeds 5 to 10 vehicles per day, so, economically, it is difficult to justify new road investments.

### Road lengths and classification

The transport system is an interconnected network of rivers, railways and roads, with the dominant transport element being the Zaire River and its tributaries. This network of rivers is complemented by about 5,000 kilometers of railways. Most roads in DRC were built during the colonial period to provide local access to the rail and river networks. A few major roads provide inter-regional transport.

The road network consists of about 125,000 kilometers of roads, excluding urban roads. The main roads total about 50,000 kilometers and include national roads, main regional roads, and secondary regional roads. Main roads now carry almost all road traffic.

There are about 7,400 kilometers of urban roads under the responsibility of the Drainage and Streets Bureau. Only about 32,000 kilometers of the about 75,000 rural access roads have been

inventoried since independence. Most of these roads are narrow (2.5 to 3.5 m wide) dirt tracks in poor to very poor condition.

**Table 3.13. DRC's classified road network**  
(kilometres)

Road Type	Length, km
National Roads	20,700
Main Regional Roads	20,200
Secondary Regional Roads	9,100
Rural Roads	75,000
Urban Roads	7,400
Total	132,400

Main roads include national roads, main regional roads, and secondary regional roads, and total about 50,000 km.

### Road conditions

Recent and accurate information on road conditions do not exist. The table below represents a best guess. However, anecdotal information about extreme road conditions were abundant. Most of the rural access roads are not passable by car.

**Table 3.14. Road network conditions 1997**  
(kilometers/percent)

Road Network	Paved				Unpaved				Total (km)
	Total (km)	%Good	%Fair	%Poor	Total (km)	%Good	%Fair	%Poor	
Main roads	2500	15	30	55	47,500	20	20	60	50,000
Urban roads					7,400				7,400
Rural roads					75,000				75,000
Other roads									
Total	2,500				129,900				132,400

Source: Ministry of Public Works, 1998

### Institutional arrangements

*Office des Routes (OR)* is the main transport parastatal responsible for construction and maintenance of the main road system. The agency is operationally and financially autonomous under the authority of the Ministry of Public Transport. By the end of the 1980s, the OR had about 8,000 employees and was able to maintain about 40,000 kilometers of the priority network. Performance of the OR improved during the 1980s with financing from a number of external donors, including IDA, through the Sixth Highway Project. The OR was reorganized in 1989, and the number of personnel was reduced from 8,000 to 2,500. In 1993 The WB suspended operations in then Zaire because the country had fallen into non-accrual status and because of the deteriorating conditions in the country.

At the end of the 1980s the OR had a corps of about 300 engineers and an even greater number of technicians. In the early 1990s the enterprise went through a reorganization, with a view to increasing private sector involvement in road maintenance and expanding the network to some 190,00 kilometers.

Of course, the transport sector has been badly affected by the economic and political problems encountered during most of the last decade. Basic infrastructure has suffered from the civil war activities and from insufficient maintenance and investment.

Private investment and foreign financing of projects have virtually disappeared as a result of economic and political disturbances.

### **Staffing**

The entire management of the Office des Routes was sacked on May 12, 1998, on corruption charges.

#### Salaries

Engineer	US\$250/month
Technician	US\$ N/A

### **Road maintenance activities**

The low level and unsteady flow of resources have hindered the capacity to rehabilitate and maintain the road network. The regional authorities do not have the capacity to mobilize financial resources.

### **Equipment**

No information available.

### **Contracting**

Rehabilitation and maintenance of rural roads have traditionally been carried out by small contracting firms or by larger agro-industries rather than by force account works.

The beginning of the 1990s saw many promising developments as far as road management was concerned. Maintenance works financed from local funds enabled OR to enter into subcontracting arrangements with more than 100 local enterprises, involving more than 21,000 kilometers of roads. OR staff holding was reduced from 8,000 to 2,500 with increased productivity. Work was based on competitive bidding, which promoted more than 100 small-and medium-scale contractors involved in public works and the creation of 15,000 new jobs, absorbing some of the staff affected by the reduction of OR. Equipment management was made financially independent from OR and improved considerably. The new style management appointed showed that the level of renting equipment to SMEs and force account activities could generate enough resources for buying spare parts and maintaining equipment. The overall fleet of 98 bulldozers, 130 loaders, 192 graders, 660 trucks, etc. generated a turnover of US\$19 million in 1992, compared to virtually nothing prior to the reorganization. Works amounting to US\$187 million in 1991 and 1992 improved conditions of the country's road network. The percentage of roads in poor condition declined from 55 percent in 1990 to less than 30 percent over this two-year period on a priority network of about 23,000 kilometers. The percentage of good roads increased from 0 to 16.

## **Financing**

The government decided in 1989 to decentralize rural access roads activities. The budget allocations for each region would still be decided centrally, but the programming, procurement, payment, and monitoring of the works would be carried out under the regional governor's authority. Twice a year the regional governor would call meetings of a Regional Road Committee (CRR), consisting of zone commissioners, regional representatives of OR, the regional coordinator of SNRDA, regional representatives of technical ministries, local business, and main NGOs.

In 1997 a private group was awarded a contract for the rehabilitation of the road between Kinshasa and Matadi, which is the major link for two-thirds of Kinshasa's imports. Road tolls ranging from US\$2 to US\$25, according to weight, were imposed on this route from January 1998. It presently takes around 15 days for a truck to drive the 200 kilometers distance from Matadi to Kinshasa.

Both OR and the Agricultural and Rural Development Departments received considerable external and local financing mainly for road maintenance. The local funding came from the proceeds of a fuel tax and from the investment budget. Until 1989, OR received financing for road maintenance from an earmarked tax on fuel, which was collected by the petroleum companies and paid directly to OR (Road Fund). In 1987 SNDRA also became a beneficiary of the earmarked tax. Up to 1989 this financing mechanism met with problems because of high inflation, which resulted in an erosion of revenues. Retail prices of petroleum products were not adequately adjusted, and the petroleum companies did not transfer the road tax to OR and SNDRA. The road tax system was again overhauled by the government in 1989. A new transport surcharge was created to replace the various earmarked taxes on fuel, based on imported quantities and tax payable to the customs authority about three months after entry to the country. The proceeds would be automatically shared between the beneficiaries, with OR getting 43 percent and SNRDA 6 percent, equivalent to about US\$37 million and US\$5 million in 1990.

At the regional level there has been no sustainable system of funding for road maintenance. Regions have very limited resources and have been unable to cover all their sector priorities. This situation has caused chronic disruption in road maintenance and systematically increased the need for rehabilitation. Adequate funding of rural access roads would need an overall reform of local taxation to provide the regions with an adequate revenue base.

Good results were apparently obtained from experiments in 1993 with low-cost road construction known as "economy paving," with greatly reduced per kilometers cost of new roads.

### *Road maintenance requirements*

Estimates of full maintenance requirements have only academic interest. There are no prospects that any major part of the road network would be subjected to adequate maintenance in the foreseeable future. However, more than US\$100 million would be required per year to maintain the main roads in the country on a sustainable level, or about 3 percent GDP.

## **References**

Mr. Phillipe NGANGA, July 1998, *Country Report for this Study*, Brazzaville, Congo  
World Bank. 1995, *Sixth Highway Project. PCR*. Washington, D.C.

# Equatorial Guinea

## Country Profile

The country is made up of the island of Fernando Poo, on which the capital city Malabo is located, and the mainland territory of Rio Muni. The population is about 500,000, of which about 60 percent are urban. The four biggest towns are Malabo and Luba on the island, with 65,000 and 23,000 inhabitants, and Bata and Mbini on the mainland, with about 30,000 and 17,000 inhabitants.

<b>Population:</b>	0.4 million
<b>Surface Area:</b>	28 square kilometers
<b>GDP (US\$):</b>	152 million

## Economy

Cocoa export has been the backbone of the nation's economy since independence in 1968. In 1997 the GDP per capita was about US\$150 million.

The origins of the gross domestic product for 1997 were:

<i>Agriculture</i>	59 percent
<i>Industry</i>	12 percent
<i>Services</i>	29 percent

## Vehicle fleet

The DGTP does not maintain statistical data of vehicle fleet from year to year. The French consultant BCEOM made a survey in 1997 in connection with establishing a road fund. Estimations of vehicle fleet gave the following result:

**Table 3.15. Equatorial Guinea's vehicle fleet**  
(numbers)

Cars	586
Pick-ups	582
Trucks	92
Others	7
Total	1,267

## Traffic

N/A

## Road lengths and classification

**Table 3.16. Equatorial Guinea's classified road network**  
(kilometres)

Road Type	Length, km
National Road	1,043
Provincial Roads	221
Forest Roads	242
Agricultural Roads	963
Total	2469

## Road conditions

**Table 3.17. Road network conditions, 1997**  
(kilometers/ percent)

Road Network Conditions	Paved				Unpaved				Total Km
	Tot. km	% Good	% Fair	% Poor	Tot. km	% Good	% Fair	% Poor	
Main Roads	292	40	20	40	715	25	30	45	1,007
Urban Roads									
Rural Roads									
Other Roads					1,462				1,462
<b>Total km</b>	292				2,177				2,469

Source: Country Report

## Institutional arrangements

The institutional arrangements of the road sector are defined in a regulation from 1996. The Directorate of Public Works is responsible for maintaining roads on the island and the mainland. The directorate is managed by a small staff consisting of the director general, an administrative secretary, and a technical specialist. The technical section includes a soils and materials laboratory and an office for design and supervision. DPW is organized with one division on the island, situated in Malabo, and one division in Bata on the mainland. The Malabo division is managed by a chief engineer in charge of materials, studies, and rehabilitation and emergency work by force account brigades. The mainland division is headed by a chief engineer, in charge of : account section; soils and materials laboratory; design and supervision office; maintenance office; training school.

## Staffing

No information available.

## Road maintenance activities

Two maintenance teams are operating on the island. One team consisting of one foreman and thirteen workers is responsible for pothole repairs and cleaning shoulders on the road to the airport, and occasionally for work in Malabo when requested by the municipality. One team consisting of one foreman and 15 women workers carries out maintenance in the central area of the island. The two teams have one tractor and one lorry, and a limited amount of simple equipment.

**Equipment**

Only a few cars and a very limited fleet of equipment are available for force account works.

**Contracting**

Limited parts of the road work are carried out by contract.

**Work methods**

DGTP has a small laboratory equipped to perform simple soil and materials tests and controls, such as density and Atterberg limits, but presently without qualified personnel.

Work Methods

**Financing**

Adequate financing of full maintenance would require about US\$3.74 million per year, or about 2.5 percent of GDP.

**References**

Mr. Pierre MAGANGA, September 1998, *Country Report for this Study*, Libreville, Gabon.

# Gabon

## Country Profile

<b>Population:</b>	1.1 million
<b>Surface Area:</b>	267,668 square kilometers
<b>GDP (US\$):</b>	3.84 billion

## Economy

Gabon is located near the equator along 750 kilometers of the African coast. Gabon's economy is heavily dependent on oil export. Oil production first began in 1957 and has assumed increasing importance over time. About 73 percent of Gabon's population are living in urban areas, which is unusually high. Half of the population lives in the two major cities, Libreville, the administrative capital (420,000 inhabitants) and Port Gentil, the country's economic and business capital (79,000 inhabitants). Port Gentil is not accessible by road from Libreville, which accounts for a considerable air transport between these main economic centers of the country.

The origins of the gross domestic product for 1997 were:

Agriculture	7	percent
Industry	40	percent
Services	53	percent

## Vehicle fleet

The vehicle fleet totals about 30,000. It increased by about 2 percent per annum between 1977 and 1986, and has remained the same since then. The size of the 1997 vehicle fleet:

**Table 3.18. Gabon's vehicle fleet**  
(numbers)

Vehicle Type	Number (1997)
Cars	8,820
Light commercial vehicles	7,560
Minibuses	4,600
Large Buses	7,650
Trucks	9,000
Tractor- semitrailers	
Trailers	
Total Vehicle Fleet (Excluding motorcycles)	30,000

Source: Ministère de l'équipement, Libreville, 1995.

## Traffic safety

The most recent information on road traffic safety is from 1995, when 166 people were killed. This was an increase from the year before, when 120 people were killed on roads in Gabon. The fatality per vehicle rate of 55 persons killed per 10,000 vehicles indicates an urgent need to initiate traffic safety programs in Gabon.

## Traffic

Traffic varies according to the type of road and location, and reaches up to some 700 vehicles per day on the most trafficked roads in urban areas. The traffic distribution on the road network is:

AADT < 20	38%
AADT 20-50	17%
AADT 51 - 100	15%
AADT > 100	30%

The number of passenger kilometers on roads increased from 28,527 million in 1985 to about 54,200 million in 1990. During the same period the transport volume in terms of tons-kilometers increased from 131 million in 1985 to 1,210 million in 1990. The dramatic increase was due to the transport of manganese, which accounted for more than 60 percent of the total. The road transport accounts for 45 percent of goods transport and 64 percent of passenger traffic.

The transport system comprises the 649 kilometers long Trans-Gabonese railway, completed in 1987 and about 7,700 kilometers of roads and a domestic aviation system with some 110 airports or landing strips. The transport infrastructure is of a relatively recent date and represents a heavy investment from the government's budget, such that during the first half of 1980s, transport accounted for more than half of public investment. The investment in the railway was about US\$3.5 billion, or about two thirds of the total, which carries only about 7 percent of the passenger traffic and 17 percent of freight, in terms of passenger and goods kilometers. Roads carry about 64 percent of interurban passenger transport.

The rapid urbanization has caused a heavy demand for transport in the largest cities, like Libreville, and consequently traffic congestion and general degradation of the environment. Other urban centers tend to resemble large villages, and typically lack proper access roads and effective social and health services.

## Road lengths and classification

The road network totals about 7,700 kilometers, excluding urban roads, of which about 815 are paved, 1,300 kilometers are engineered laterite roads, and 3,300 kilometers are gravel or laterite surfaced roads. The remaining 2,400 kilometers are unclassified earth roads and tracks serving agricultural areas. Gabon has one of the lowest densities of roads in the region with 41 kilometers of roads per 1000 square kilometer. The interurban road network is divided into three classes: national, provincial, and departmental roads.

**Table 3.19. Gabon's classified road network**  
(kilometres)

Road Type	Length, km
National Roads (RN)	4037 (44%)
Provincial Roads (RP)	2254 (24%)
Departmental Roads (RD)	2959 (32%)
Total	9250

## Road conditions

The road network has received insufficient funding in recent years and has deteriorated to the point that access to many productive areas has become difficult and expensive.

**Table 3.20. Road conditions, 1997**

(kilometers/percent)

Road Network Conditions	Paved				Unpaved				Total Km
	Tot. km	% Good	% Fair	% Poor	Tot. km	% Good	% Fair	% Poor	
Main Roads	878	43	42	15	6,920	12	33	55	7,798
Urban Roads					755				755
Rural Roads					2,400				2,400
Other Roads									
<b>Total km</b>	<b>878</b>				<b>10,075</b>				<b>10,953</b>

Source: Country Report

## Institutional arrangements

Two programs were recently introduced in the road sector to improve services: The first was a three year maintenance program (PTER), and the second a program for urgent rehabilitation and improvement (PARR). The PTER was carried out from 1990 to 1993 and was co-financed by the WB, ADB, France, and the government of Gabon.

Maintenance on contracts	16,870 billion FCFA
Maintenance force account	13,060 billion FCFA
Equipment	11,510 billion FCFA
Studies	3,820 billion FCFA
Management	2,250 billion FCFA

The PTER comprises an ambitious program for rehabilitation of about 3,739 kilometers of rural roads, 408 kilometers of urban roads and 4,900 bridges with an estimated total cost of about 282 billion FCFA in several phases. The first phase is estimated to cost 132 billion FCFA over a five-year period and cover about 1,784 kilometers of rehabilitated roads.

The *Direction Générale des Travaux Publics (DGTP)* is responsible for road rehabilitation and maintenance, and relies on The Directorate of Maintenance of Roads and Aerodromes (DERA) for execution of works.

## Staffing

The total staffing of DERA in 1997 was as follows:

Regional Directors	4
Engineers	27
Technicians	229
Workers	1,489

### **Road maintenance activities**

Within DGTP, the Directorate of Transport Infrastructure (DIT) is responsible for road construction and maintenance by contract while the Directorate of for Roads and Aerodromes (DERA) is responsible for maintenance work by force account. The DERA has four regional directorates, each again divided into sixteen local sub-divisions.

### **Equipment**

The Directorate of Equipment (DOM) under the DGTP, is responsible for procurement of equipment, supply of spare parts, and major repairs of equipment. It operates a central workshop in Libreville, adequately staffed and well equipped. The road maintenance equipment is assigned to the four regional sub-divisions, which are then responsible for its operation and for minor repairs. At the end of 1997, the fleet of equipment includes about 900 units, a large portion of which are old and out of repair. The renewal cost of the fleet is estimated at about US\$80 million. A study was carried out by a Canadian consultant, Tecsuit International Ltd, for PAPSUT in 1997, to review the status of equipment management by DOM. The study found that the organization lacks qualified and motivated staff, and there is no strategy nor budget for renewal of plant. The study recommended that the size of the equipment fleet should be scaled down in step with an increasing reliance on private sector resources for maintenance work. At the same time options for commercialization or privatization of DOM should be considered.

### **Contracting**

In 1997 about 75 percent by expenditure of routine maintenance and 100 percent of periodic maintenance was carried out by contracts. A study carried out by Tecsuit International Limited in 1997 on private sector capacity, identified about ten SMEs that would be interested in bidding for road maintenance contracts. Most of the small contractors have had a limited turnover, as most of the work has been carried out by DGTP and with equipment supplied by DOM. Another common problem is a lack of qualified management staff. Some labor-based contracts have been tried with mixed results, mainly because of a lack of supervision.

There are presently five local contractors pre-qualified for road rehabilitation works, and one Chinese and one Spanish road contractor operating in the market.

### **Works methods**

In its transport sector policy, the government has decided to carry out road maintenance increasingly with small and medium-sized contractors using labor-based methods. AGETIPE has been contracted by the government to procure and manage local contractors that are free to select their own method of execution, whether labor-based or mechanized. Experience so far shows that a number of tasks have been carried out manually in all contracts, such as clearing bush and surface and sign repairs. The quality of work has been satisfactory.

### **Laboratory**

The road laboratory (LRTP) is a public entity, but financially independent and commercially managed. The laboratory carries out material tests for building and civil works for private and public clients, as well as quality control and adherence to materials specifications.

### **Financing**

#### *Road investment*

During the last decade, about 378 kilometers of new roads have been constructed and about 1,800 kilometers of main roads rehabilitated in Gabon. Financing of road investments from 1994 to 1997,

totals about US\$300 million, about 40 percent financed by the Gabon government and the rest by foreign financing.

A program for urgent rehabilitation and improvement (PARR), started in 1992. Until 1997 it financed paving of about 346 kilometers of roads. The second trench of the PARR program extends up to year 2000 and would include paving of another 537 kilometers of main roads at a cost of about US\$325 million. The whole PARR program is expected to run until year 2005, and would include rehabilitation of and improvement of 1,266 kilometers of bitumen roads for a total of about US\$752 million.

An agreement was signed in mid 1998 between the Government of Gabon and the European Development Fund (EDF) for financing the rehabilitation and upgrading to bitumen standard of 57 kilometers of the route between Libreville and the Cameroon border, at a total cost of about US\$30 million.

#### *Maintenance funding*

Since the Road Fund was abolished in 1990, the actual allocations for routine maintenance have continued to fall below the appropriations in the national budget, and far short of the real needs. During the 1985–1992 period, the total expenditure on the road network averaged approximately US\$32 million a year. New construction represented 43 percent of the total, with rehabilitation and periodic maintenance representing 37 percent and routine maintenance 20 percent.

#### *Maintenance funding requirement*

DGTP has estimated annual requirements to keep the existing road network in good repair to about US\$36 million (SAR/WB Transport Sector Project/No. 12082-MLI). The estimated amount includes a considerable portion for rehabilitation of existing roads. The consultant's estimate of required annual funding of maintenance, based on HDM III and excluding rehabilitation, was about US\$ 20.7 million; of which US\$8.7 million is for routine maintenance.

#### **References**

World Bank. 1994. *Transport Sector Project. Staff Appraisal Report*. Washington, D.C.  
ASPRO, Mr. Pierre MAGANGA, September 1998, *Country Report for this Study*, Libreville, Gabon.

# São Tomé & Príncipe

## Country profile

<b>Population:</b>	145,000
<b>Surface Area:</b>	960 square kilometers
<b>GDP (US\$):</b>	US\$42 million

### Economy:

The origins of the gross domestic product for 1996 were:

<i>Agriculture</i>	27 percent
<i>Industry</i>	21 percent
<i>Services</i>	52 percent

### Vehicle fleet

The size of the 1997 vehicle fleet is not known. A very rough estimate of 3 000 vehicles has been used in the statistics.

### Traffic

Information not yet available.

### Road lengths and classification

São Tomé & Príncipe has 300 kilometers of roads, of which 200 kilometers are paved.

### Road conditions

The paved road network of 200 kilometers, or 66 percent of the network, is generally in good condition.

### Institutional arrangements

Information not available.

### Staffing

Information not yet available.

### Road maintenance activities

Information not available.

### Equipment

Information not available.

### Contracting

Information not available.

### Works methods

Information not available.

### Financing

Information not available.