

Sustainable Urban Mobility in 'Francophone' Sub-Saharan Africa

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List of acronyms and abbreviations

AGETU	<i>Agence des Transports Urbains (Abidjan)</i>
APIX	<i>Agence nationale pour la Promotion des Investissements et les Grands Travaux (Senegal)</i>
BRCTU	<i>Bureau de Régulation de la Circulation et des Transports Urbains (Bamako, Mali)</i>
BRT	bus rapid transit
CETUD	<i>Conseil Exécutif des Transports Urbains de Dakar (Senegal)</i>
CFA franc	Currency used in several countries in Western and Central Africa, currently with a fixed exchange rate to the euro: 1 euro = 655.957 CFA francs
CO	Carbon monoxide
CO ₂	Carbon dioxide
CODATU	<i>Coopération pour le développement et l'Amélioration des Transports Urbains et périurbains, an international NGO based in France</i>
FAO	Food and Agriculture Organization of the United Nations
FDTU	<i>Fonds de Développement des Transports urbains, Dakar</i>
FSSA	'Francophone' Sub-Saharan Africa
GDP	gross domestic product
HC	hydrocarbons
km	kilometre
NGO	non governmental organization
NO _x	nitrogen oxide
PM10	particulate matter, of 10 micrometers or less
SITRASS	<i>Solidarité Internationale pour le Transport et la Recherche en Afrique Sub-Saharienne, International Solidarity on Transport and Research in Sub-Saharan Africa, an international NGO based in France</i>
SOCATUR	<i>Société camerounaise de transport urbain (Douala, Cameroon)</i>
SOTRA	<i>Société des transports abidjanis (Abidjan, Côte d'Ivoire)</i>
SOTRACO	<i>Société de transport en commun de Ouagadougou</i>
SOTRAL	<i>Société des Transports de Lomé</i>
SOTRAO	<i>Société de Transport de Ouagadougou</i>
SOTUC	Société de transport urbain du Cameroun
UEMOA	<i>Union Economique et Monétaire Ouest Africaine, the West African Economic and Monetary Union</i>
US\$	United States of America dollar

1. The Crisis of Sustainability in Urban Transport

The cities of 'Francophone' Sub-Saharan Africa (FSSA)¹ are subjected to the sustainability crisis in urban transport in a context of rapid urbanization and concentration of population in capital cities. Countries can be classified according to the percentage of the urban population in the total population in 2008:²

- Less than 30 per cent: Burkina Faso, Burundi, Chad, Niger, and Rwanda.
- Between 30 per cent and 50 per cent: Benin, Central African Republic, DR Congo, Equatorial Guinea, Guinea, Guinea-Bissau, Madagascar, Mali, Mauritania, Senegal, and Togo.
- Around 50 per cent or more: Cameroon, Cape Verde, Congo, Côte d'Ivoire, Djibouti, Gabon, Réunion, and Sao Tome and Principe.

In the majority of countries this share of urban population has increased by 200 to 500 per cent between 1960 and 2010. This growth of urbanization is expected to continue.

Basic travel needs (for work, school, shopping, medical care, visits and social activities...) are not well satisfied. The difficulty of access to motorized transport modes forces many people to walk long distances and in fact to limit their mobility to their home surrounding.

The sustainability will be examined distinguishing four dimensions. The economic dimension is expressed at different levels:

- For households, difficulty to access motorized mobility because they have no resources enough.
- For public authorities, difficulty of funding the new investments for infrastructure and for fleets of public transport to meet increasing travel needs.
- For public transport companies, inability to balance their operating cost by their receipts so that they need to get subsidies, which the State or the municipality have difficulties or are reluctant to give on a clear and stable basis. The affordable fares oblige the operators to reduce their costs and therefore the quality of service.

The environmental dimension deals with the local pollution emitted by the transport modes, and also with the greenhouse gas emissions which have global consequences on climate change. The local pollution seems high in the densest areas where there is a concentration of traffic and congestion. But the low level of private cars fleets limits the global effect of polluting vehicles. The greenhouse gas emissions are limited due to the low number of vehicles or the low level of motorized mobility. But one has to be careful with the trends.

The social dimension is expressed by the low level of access to public transport for the urban poor, which is linked to the economic dimension through the pressure of transport expenses on the household budget when one or more of its members use daily motorized modes (there are some methodological considerations and debates around this kind of results but one will give only the results from surveys which have to be considered with the necessary caution).

1. The countries covered by the report are the following: Benin, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Gabon, Guinea, Guinea-Bissau, Madagascar, Mali, Mauritania, Niger, Réunion, Rwanda, Sao Tome and Principe, Senegal, Togo.

2. United Nations, 2010.

The economic dimension deals with the high transport operating costs which are not well covered by user's fares, as well as calls for increased productivity.

The institutional dimension is dominated by poor institutional integration, despite the presence of organizing authorities in Abidjan and Dakar. The decentralization process switching responsibilities from State to the municipalities is still very limited in the field of urban transport.

The report focuses on the experience of large cities³ (often capital cities) as they concentrate the maximum of difficulties and of responses to these difficulties. The large cities also register the maximum of information and analysis, on which this report is based.

Some parts are therefore difficult to review, due to limited documentation on real experiences, namely:

- the chapter on commercial goods transport;
- the chapter on integrated land use and transport planning; and
- the approach of gender and age mobility in terms of policy responses.

A main focus is given to chapters dealing with public transport and informal transport, as these are the most documented and constitute a major part of challenges of sustainable mobility in FSSA cities.

3. The main cities which will be referred to in the report are: Abidjan; Antananarivo; Bamako; Conakry; Cotonou; Dakar; Douala; Lomé; Ouagadougou; Yaoundé. According to the rare available sources of information the following cities are also considered: Bangui; Brazzaville; Bujumbura; Djibouti; Kigali; Kinshasa; N'Djamena; Niamey; Nouakchott.

2. Non-Motorized Transport

The non-motorized transport gathers all the travel modes which do not need an engine with external energy (usually oil) but which use human or animal energy. Actually that concerns in FSSA cities mainly walking and bicycling.

2.1. Brief overview of non-motorized transport modes

Walking is a very important travel mode everywhere, the registered share of which is often more than 50 per cent of urban trips when reliable data are available.⁴ A travel household survey made in 2000 in Dakar gives a share of 73 per cent of urban trips by walking. Other surveys indicate:

- 57 per cent in Bamako.
- 69 per cent in Niamey.
- 42 per cent in Ouagadougou (this relatively low share is explained by the importance of two wheeler use).

The importance of walking is reinforced by the fact that walking is used also as a complementary travel mean to access to a public transport mode.

Bicycle is rarely used in African cities: for instance less than 1 per cent of households are equipped in bicycles in Yaoundé.⁵ A noticeable exception is Ouagadougou⁶ the mobility system of which is dominated by two wheelers, motorized and not. Bicycle share is supposed to be around 15 per cent of mechanized trips, what is a very high share for this mode.

Forms of non-motorized public transport (like cycle rickshaws) are not really present in FSSA cities. Nevertheless there were cycle taxis in the 1990s in Central Africa Region: Kigali (Rwanda) (forbidden some years ago) and Bujumbura (Burundi).

Non-motorized transport is also frequently used for goods delivery: either hand carts or animal drawn carts. In Senegal this activity (horse carts) is made by young rural people during a part of the year when they are not mobilized by work in the fields: it tends to be a seasonal activity, particularly for transport of building materials (cement, sand, etc.).

2.2. Trends and conditions of non-motorized transport within the urban context

2.2.1. Walking

Despite of the comparative data insufficiency, the trend for walking seems to register a kind of stability of its importance under the influence of several factors:

- Continuous crisis of public transport limiting the easiness to use it.
- Importance of poverty limiting the use of motorized modes, which are too expensive for a daily use by many people.
- Urban growth sustained partly by rural migrations, which makes acceptable walking on long distance for cultural reasons.

The infrastructures dedicated to pedestrians are very limited. Paths along the roads are often not practical to use, people are thus obliged to walk on the roads, what is dangerous for

4. Diaz and Kane, 2002.

5. Berger, 2010.

6. Bamas, 2002b.

them. Pedestrians tend to be the first victims of accidents: it has been estimated that two third of persons killed in accidents in African cities are pedestrians⁷ (see section 2.3 below).

Walking conditions are deteriorated by many factors:

- Absence of footpaths along the roads.
- In case of footpaths in central areas, they are often occupied by small informal activities or vehicles parking.
- In Sahelian cities road sides can be covered by sand, making walking more difficult.
- The presence of solid or liquid waste on road sides is also a factor of trouble for walking.
- In the rainy season, poor drainage makes walking impractical in many areas.
- Increasing safety of pedestrians walking along ways or crossing roads, induced by the traffic intensity growth.

Figure 1. Walking difficulties during raining season in Pikine, Dakar (Senegal)



Photo: Transitec.

Figure 2. Pedestrians walking on the railway in Conakry, Guinea



Photo: Adolehoume, 2003.

7. Kumar and Barrett 2008.

The importance of walking for the urban poor is illustrated in Antananarivo⁸ by surveys in a sample of poor districts, see Table 1.

Table 1. Share of walking in mobility in some areas of Antananarivo, Madagascar

Area	Walking share (%)
Amosizato Ants 1	87.7
Mahabo	91
Mahalavona	94.7
Imamba	85
Ambodivona	94.6

Source: Deville, 2008.

2.2.2. Bicycle

In Ouagadougou bicycle was a traditional mode of transport like in other Sahelian cities (Bamako, Niamey, etc.). One could fear its regression or its disappearance when the motorization has increased in 1990s and 2000s. But one observed that the bicycle use has stayed at an important level. The users are mainly the poor, but also the scholars. Its share in the modal split was estimated to 17 per cent of mechanized trips in 1992 (the last household travel survey). But the traffic counting shows the increase of bicycle trips and probably the stability of its modal share in the beginning of the 2000s.

Table 2. Traffic counting on the major roads in Ouagadougou, Burkina Faso (two directions)

Daily number of vehicles	1996		2000		Annual rate of increase (%)
	Volume	%	Volume	%	
Avenue Yatenga					
Bicycles	9,389	30.5	12,437	35.7	7.3
Motorcycles	17,238	56.0	16,918	48.6	-0.5
Cars and others	4,144	13.5	5,450	15.7	7.1
Avenue Bassawarga					
Bicycles	9,888	19.4	12,247	22.2	5.5
Motorcycles	28,588	56.0	27,796	50.3	-0.7
Cars and others	12,538	24.6	15,167	27.5	4.9
Avenue Kadiogo					
Bicycles	10,063	20.4	8,587	16.5	-3.9
Motorcycles	28,000	56.7	28,670	55.2	0.6
Cars and others	11,350	23.0	14,681	28.3	6.6
Avenue Charles de Gaulle					
Bicycles	9,991	21.0	13,036	21.0	6.9
Motorcycles	27,107	57.0	31,343	50.4	3.7
Cars and others	10,455	22.0	17,835	28.7	14.3

8. Deville 2008.

Daily number of vehicles	1996		2000		Annual rate of increase (%)
	Volume	%	Volume	%	
Route de Fada					
Bicycles	8,867	23.1	10,122	22.8	3.4
Motorcycles	21,959	57.2	23,253	52.5	1.4
Cars and others	7,579	19.7	10,943	24.7	9.6
Total of all major roads					
Bicycles	48,198	22.2	56,429	22.7	4.2
Motorcycles	122,892	56.6	127,980	51.5	1
Cars and others	46,066	21.2	64,076	25.8	9.7

Source: *Bamas, 2002b*

In some cases (Dakar) one registers the presence of horse drawn *calleches*, which are adapted to the sandy streets in suburbs. But they have a very marginal role. No recent information has been identified about it.

More important in Dakar is the horse drawn cart used for transporting materials: building materials needed for housing building which is very dynamic. These carts are usually driven by young boys coming from rural areas. That involves risks of accident because their driving behaviour tends to not respect the other vehicles; the horse carts use is regulated and it is forbidden in Dakar centre; the trend is to make them disappear in the urban area.

2.2.3. Conditions and trends of non-motorized transport infrastructure in urban areas

Usually there are no dedicated infrastructures for bicycles; the only known case is Ouagadougou, where dedicated lanes have been built along the main axes deservng the central area (see Table 3).

Table 3. Bicycle lanes in Ouagadougou, Burkina Faso

Avenue	Implementation period	Length (km)
Charles de Gaulle	1984–1989	4.5
Yatenga	1982–1985	3
Che Guevara	1986–1987	1.5
Bassavarga	1987–1988	6.3
Road of Kaya	1990–1992	5

Source: *Bamas, 2002a*.

These lanes are also used by some motorcycles. From a safety point of view these ways are useful but they are faced to the danger introduced by rapid motorcycles driven on it. The problem of roads crossings remains, which would need some specific measures for bicycles. The public policy of building bicycle lanes in the 1980s seems to have been abandoned, as the authorities do not want to make more promotion to bicycle and two wheelers, but declare to prefer to focus on public transport.

While sidewalks are present in central areas they are rare in many peripheral areas. In some areas one would need some basic infrastructure to improve the pedestrians' conditions: for instance foot bridges crossing ravines could avoid to pedestrians a long detour (example of Conakry illustrated by Figure 3).

Figure 3. Scholars obliged to walk on a water pipe to cross a ravine in Conakry, Senegal



Photo: Adolehoume 2003.

Figure 4. Boulevard du 30 Juin, Kinshasa, DR Congo: 2x4 ways



Photo: Afrique Rédaction, 2010.

New road investments implemented in urban areas tend not to take in account sufficiently their impacts on pedestrians. Building footbridges to cross highways (or railway) is the solution found but their design can often be criticized as they are not very convenient to use; in many cases one can observe pedestrians crossing these highways everywhere at ground level without protection from traffic.

The absence of 'pedestrian crossing islands' in large avenues is also a well known factor of danger for pedestrians, which is not taken in account enough by traffic and road engineers. A meaningful example is given by a wide avenue in Kinshasa (see Figure 4): Boulevard du 30

juin (2x4 ways) which is very dangerous for pedestrians:⁹ which justifies an awareness campaign of pedestrians. But roads designers and planners should be also made aware of the lack of safety involved by such an infrastructure.

2.3. Impacts and challenges of non-motorized transport in urban areas

From a sustainability point of view walking is positive for short distance trips because it is very cheap, it does not consume external energy and does not emit greenhouse gases. But walking can have social negative effects for medium and long distance trips (more than around, 1–2km, what corresponds to a limit of 15 to 30 minutes) because of its hardness and time consumption.

Walking is faced by challenges of safety and practicability in urban areas. According to available data on accidents, pedestrians are involved in 10–11 per cent of accidents registered in Cotonou and Ouagadougou (both cities dominated by two wheelers). But a majority of accidents are only with material damages. Actually the share of pedestrians in killed persons in Ouagadougou is estimated to 32 per cent,¹⁰ the most frequent being two wheeler users. In cities where the use of two wheeler is lower, pedestrians appear to be the first victims of accidents. For instance (old) data on Niamey Hospital activity reveal that more than 50 per cent of treated injured persons were pedestrians.¹¹

The challenge will be also to keep a high rate of walking in mobility when the income level will be upgraded in the future.

Bicycle use is very efficient in terms of energy and time for trips under around 5km. But the challenges it has to cope with are numerous in African cities:

- Lack of safety in present traffic conditions: it is dangerous to use bike on urban roads where many vehicles are driven without care for other users; particularly the minibus drivers are incited to have a dangerous driving behaviour as their income depends directly on the passengers they catch.
- Hardness due to heat or rain
- Negative social image: this factor was identified as the most important obstacle according to a SITRASS study made in the 1990s, the conclusions of which still look relevant.¹² People do not want to be viewed as poor as they think bicycle is a mode for the poor. This bad image is typically linked to urban living as the opposite is observed in rural areas where the bicycle use is reserved to not poor and considered favourably.

The non-motorized transport modes used for goods on the roads involve some specific shortcomings: congestion and lack of safety because these vehicles are very slow. In case of animal drawn vehicles, the drivers coming from rural areas have a very dangerous (and even illegal) driving behaviour.

9. It is reported that 510 pedestrians were killed here in 2009, but the data would have to be checked (Afrique Rédaction, 2010).

10. Adolehoume, 2002.

11. Hoekman et al, 1996.

12. Cusset et al, 1995.

3. Public Transport

Public transport designates the transport accessible to the public whatever the modes and the infrastructure (road, rail, water, etc.). In this report it will deal only with the institutional transport, sometimes also called scheduled service transport as the informal transport will be treated in the following chapter.

A specific case is the private collective transport made by employers to pick up their employees: although it is not a public transport it is a collective transport and has to be considered: it will be integrated in the present chapter. No specific information was available on emergency vehicles which are not presented in this report.

3.1. Brief overview of public transport importance

The main mode of public transport is the bus operated by a company, in principle within a contract with the relevant authority, often the State (Ministry of Transport). There is one (or several) bus company in the majority of major FSSA cities but their role is generally weak in the modal share, typically under 10 per cent with the exception of Abidjan (less than 20 per cent) (see Table 4).¹³ Cities without a bus company in 2008 include: Antananarivo, Bangui, Brazzaville, Cotonou, Kigali, Ndjamena, and Nouakchott.

Table 4. The main identified bus companies in 2008

City	Bus company	Fleet	Passengers
Abidjan	SOTRA (1960)	539 buses	20% of all public transport
Bamako	Bani Transport	50 buses	
	Diarra transport	25 buses	
	Banimonotie	10 buses	
Bujumbura	Otraco	10 buses, 30 minibuses	10% of all public transport
Conakry	Transport Future	12 buses	
	Soguitrans (2007)	100 buses?	
Dakar	Dakar Dem Dik (2000)	400 buses	
Douala	SOCATUR (2001)	70 buses	10% of motorized trips ^a
Kinshasa	Stuc	127 operating buses (out of a total of 180)	
Libreville	Sogatra (1997)	15 operating buses (out of a total of 94)	
Niamey	Sotruni (2007)	20 buses	
Ouagadougou	SOTRACO (2003)	30 operating buses (out of a total of 43)	
Yaoundé	'Le bus' (2005)	50 buses	

a. Other estimates are lower: around 7 per cent (SITRASS, 2004b).

Source: *Trans Africa Consortium, 2008.*

Buses operated by companies are most often supported by international cooperation agencies (donation or loan at reduced rate). They are either new buses (previously from Europe, more and more from India and China) or second hand buses (often from France or Italy).

13. See also Table 9 in Chapter 4.

Urban train services are not usually present in FSSA cities, although there are some exceptions: an urban rail service is operated in Dakar and in Kinshasa in bad operation conditions: they transport few passengers daily (about 10,000–12,000).

In some specific cases one registers also waterbuses: in Abidjan they are operated by the bus company SOTRA to serve some areas around the lagoon, offering important time savings by comparison to the bus routes.

3.2. Trends and conditions of public transport in urban areas

A historical perspective is necessary to understand the present weakness of bus companies. The majority of public bus companies were operated in 1990s under a mixed public-private status (*Société d'économie mixte*) with some efficiency. But they have collapsed as they could not adapt to the new economical constraints coming from the economic structural adjustment policies:

- STPN in Pointe Noire (Congo).
- SOTRAC in Dakar (Senegal).
- SOGETRAG in Conakry (Guinea).
- SOTRAZ in Kinshasa (DR Congo).
- SOTUC in Douala and Yaoundé (Cameroon).

That meant the end of a model of semi public sector which was too dependant of subsidies and where the State was too present and impeded an autonomous management.

There is one exception to this disappearance of bus companies, namely SOTRA in Abidjan. The key of its survival comes probably from its efficiency and the diversification of its activities (maintenance and assembling of vehicles) but also from the support from the Ivoirian State with important financial contributions illustrated in Table 5, despite frequent delayed payments threatening the cash management. This contribution, covering mainly a compensation of reduced fares, represented an estimated share of 30 per cent of total receipts in 1998.¹⁴ This share has probably increased in the 2000s.

Table 5. Financial contribution from the national government to SOTRA (Abidjan, Côte d'Ivoire)

	Million CFA francs					
	2000	2001	2002	2003	2004	2005
Compensation of fare insufficiency	3,600	3,600	3,600	3,600	3,600	3,600
Subsidized groups (gratuity included)	13,660	15,930	24,653	21,880	22,800	21,900
Total	17,260	19,530	28,253	25,480	26,400	25,500

Source: Zoro-Fofana, 2007.

Other old public bus companies are still in operation, although at a marginal scale and in very precarious conditions: example of Kinshasa with City Train, a company created in 1989, which transport 25,000 passengers daily thanks to a fleet of 100 buses. But the company is financially vulnerable because 24 per cent of passengers do not pay the fare, having a free access permit (mainly the police and military members), without taking account of fraud.¹⁵

14. Duprez 2002.

15. Woto, 2009.

New bus companies have been created at the end of the 1990s and the 2000s in many cities. But they did not find their right status and they do not have a large share of the public transport market, which is still dominated by the informal transport (see Chapter 4). Such bus companies are observed in many cities:

- Bamako (Mali): many new small companies in 2000s under concession contracts after the disappearance of two companies (Tababus and Bamabus).
- Bujumbura (Burundi): OTRACO, very subsidized.
- Conakry (Guinea): SEGUITRANS created in 2008 (Guinean State has 49 per cent) besides 'Transport Future' created around 2000.
- Dakar (Senegal): Dakar Dem Dik, created in 2000 replacing the previous SOTRAC.
- Douala (Cameroon): SOCATUR, created in 2001.
- Libreville (Gabon): SOGATRA, virtually in bankrupt.
- Lomé (Togo): SOTRAL created in 2007.
- Niamey (Niger): SOTRUNY after privatization of previous SNTN.
- Ouagadougou (Burkina Faso): SOTRACO created in 2005.
- Yaoundé (Cameroon): 'Le Bus', created in 2005 but seems have collapsed.

The experiences of Dakar Dem Dik (Dakar), SOCATUR (Douala) SOTRACO (Ouagadougou), SOTRAL (Lomé) are examined below. There are not yet experiences with bus rapid transit projects.

Dakar Dem Dik, the bus operator in Dakar, was created in 2001 as a private company. The capital is actually shared between the government (76.6 per cent) and private Senegalese investors. The aim of the Senegalese state was to leave as soon as possible when the financial situation would be sustainable and able to attract private investors, but the story is different.

The fleet has evolved by steps: around 100 second hand buses to start in 2001, 60 new Volvo buses in 2005 (obtained through bilateral assistance from Sweden). 349 new Tata buses in 2006 (bilateral assistance from India) the delivery of which was staggered on a few years.

Dakar Dem Dik benefits from subsidies (payments delayed for procedural reasons) but their amount is not publicly accessible. The operating performances indicated in Table 6 are not good: in average less than 200 km run by bus daily, less than 600 passengers by bus daily (not more than the new minibuses in operation, despite of the difference of capacity).

Table 6. Operation data of Dakar Dem Dik, Dakar, Senegal

Year	Buses in operation	Annual passenger volume (millions)	Daily passengers by bus	Km/bus/day
2001	95	5.4	190	N/A
2002	125	18.5	495	N/A
2003	79	11.8	500	N/A
2004	54	8.1	500	241
2005	180	27.6	510	180
2006	288	46.9	540	191
2007	288	50.6	585	179
2008	280	49.6	590	190

Source: Kumar and Diou, 2010.

SOCATUR in Douala is an example of a private company created and operated without any subsidy neither taxes reduction nor exoneration, after the collapse of previous SOTUC which operated both in Douala and Yaoundé. Its initial fleet was of 109 second hand buses. This fleet has declined during the 2000s. Actually the share of SOCATUR in the public transport market has stayed at a very low level (around 2 per cent of mechanized trips).

A tax exoneration is claimed by SOCATUR aiming to propose lower fares: the simulation in the Table 7 shows that the basic fare covering the expenses could be reduced by 25 per cent (from 240 CFA francs to 180 CFA francs) if the taxes exoneration is obtained.

Table 7. Structure of SOCATUR operating costs (Cameroon)

Expense for one passenger	Without tax exoneration (Unit: CFA franc, 2006)	With taxes exoneration (Unit: CFA franc, 2006)
Fuel	67.5	54
Salaries	37.5	37.5
VAT (tax on added value)	24	0
Spare parts	22.5	22.5
Tax on societies	1.65	1.65
Amortization	72	51
Other	15	15
Balanced ticket price	240.15	181.65

Source: Wiolland and Sahabana, 2009

Figure 5. The bus terminal in the centre (Bia) at Lomé, Togo



Photo: Godard. 2009.

Box 1. Lomé: SOTRAL experience (Togo)

The project of a new bus company was launched in 2001 through a decentralized cooperation between Lomé and Lyon (France) with the help of CODATU.^a SOTRAL is a private bus company the capital of which the city of Lomé has 36.8 per cent (in kind contributions: depots, office, and the buses donated by SYTRAL (*Syndicat des Transports de l'Agglomération Lyonnaise*, the Lyon transport

authority), the remaining part brought by private bodies. In fact the project has formally merged with buses in operation only in September 2008.

Seven years of negotiations and administrative procedures have been necessary:

- End of 2003: cooperation agreement involving the dispatch of 11 buses from SYTRAL.
- October 2005: establishment of the public liability company SOTRAL.
- November 2006: new cooperation agreement for dispatching 15 new (second hand) buses and spare parts.
- 2006: training of staff in Lyon and in Abidjan.
- September 2007: inauguration of experimental Line 1.
- September 2008: effective starting operation of Line 1.

The results are modest^b with an average of 1267 daily passengers in 2009.

Source: a. CODATU 2010, pp 51–56; b. Eiffia, 2010.

Box 2. Ouagadougou: SOTRACO and previous experiences (Burkina Faso)

SOTRACO was created in 2003 as a mixed economy society associating the city Council of Ouagadougou (15 per cent) and several private investors (85 per cent). Public authorities provide the depot, the administrative building and the fleet of 30 new buses (loan without interest from Belgium which is a quasi gift) the ownership status of which was not clear.

Actually SOTRACO comes after negative experiences of previous bus companies which collapsed:

- X9 Regie (1984–1996), a public bus company which supported its urban activity by cross subsidizing it with interurban services benefits. But it needed also public support and subsidies, and has been dismantled after the intervention of the World Bank which wanted its privatization.
- SOTRAO (1996–2002), a mixed economy company associating the State (25 per cent) and one private investor (Burkina *moto*). This company has never been able to cover its operating costs by the receipts. The financial difficulties induced the delayed payment of taxes and default of maintenance, the reduction of buses in operation and finally the collapse of the company.

SOTRACO has faced various difficulties similar to the previous ones.

Source: Tindano, 2008.

Table 8. SOTRACO operating data (Burkina Faso)

	2004	2005	2006
Bus fleet	35	49	50
Buses in operation	27	33	34
Passengers (millions)	7,966	10,281	5,991
Commercial receipts (million CFA francs)	1,003	N/A	721
Operation subsidy (million CFA francs)	2	N/A	254.5
Other receipts (advertising, etc.) (million CFA francs)	68	N/A	27.5
Total receipts (million CFA francs)	1,073	1,121	1,003
Operating cost	1,842	1,907	1,709
Ratio receipts/expenses	58.3%	58.8%	58.7%

Source: Tindano, 2008.

Many reasons explain the difficulties to get a viable bus supply, despite of any international support:

- The weakness of status is illustrated by Lomé case where no agreement was signed between the City Council and SOTRAL, due to the incomplete decentralization process which gives the City no financial means to develop the transport sector.
- The structural deficit of operation observed in Ouagadougou and Lomé is due to the gap between the affordable fares and the operating costs. In Lomé, the initial fare of 250 CFA francs has been reduced to 200 CFA francs in January 2009 but the 'theoretical' fare required to cover operating cost is 292 CFA francs: the gap is evident, leading to an operating deficit of 22 million CFA francs (2008–2009), one third of receipts.
- The bad operational and commercial performances are due to many factors like the deteriorated state of the roads, the insufficient equipment of the depot and its location (Lomé), the competition of other modes (motorcycle taxis in Lomé), public service obligations without the corresponding resources, the insufficiency of reactivity on the market, management defaults, low commercial speed in congested roads (Dakar), low productivity of employees, attempt to serve the whole urban area without having enough buses (Dakar).

3.2.1. Bus users profile

Bus users are mainly civil servants and scholars, which is explained by the reduced fares they enjoy (Abidjan and Dakar). But the importance of scholars in the bus patronage brings difficulties the operators have to cope with and what they try to avoid: very low level of direct receipts coming from these users who get reduced fares; financial compensations for reduced fares usually paid late by the State; restless behaviour of young scholars who disturb the other users.

3.2.2. Rail services

In Dakar the urban train PTB (called *Petit Train Bleu*, then *Petit Train de Banlieue*) is operated since 1988 and its infrastructure and equipment are modernized very progressively (see Figure 6). But its role remains very minor in terms of modal share (2 per cent of motorized trips in 2000, less than 1 per cent in 2009). Actually the actions for its modernization inside PAMU (Urban Mobility Improvement Programme, *Programme d'Amélioration de la Mobilité Urbaine*) included the status reform (transfer of track provision and maintenance to Transrail, a new autonomous body for operation), the track improvement, building fences along the track (compensated by new footbridges). But all these actions have been delayed and were not finished in 2010. The number of daily passengers dropped down from 20,000 to 12,000.¹⁶

In Kinshasa an urban train is operated by the *Office National des Transports* (ONATRA) in very bad conditions. Only one third of passengers pay the fares,¹⁷ the majority of free ticket users being ONATRA staff or their family.

Some urban train projects have been identified but revealed to be difficult to implement due to the funding constraint and the economic and political uncertainty: The case of Abidjan exemplifies this difficulty.

16. Kumar and Diou, 2010.

17. Woto, 2009.

Figure 6. The urban train in Dakar (Senegal)



Photo: Transitec/Urbaplan.

In Conakry the tracks which could have been used for an urban train service (very adapted to the linear form of the city) have been dismantled in order to give space to the urban highway. The suburban railway line for passengers ceased operations in the 1990s.¹⁸ An attempt to restart the operation in 2000 lasted only a few months, due to technical problems, low level service and lack of passengers.

3.2.3. Private collective transport

Very few information is available on this kind of transport which is organized by companies (for instance banks), or by administrations, schools and universities. Estimates were made in Abidjan for the year 1998:¹⁹

- Around 100,000 to 120,000 passengers daily;
- 8 to 10 per cent of them are made by SOTRA through contracted special services;
- 4 per cent of motorized trips; and
- Around 3000 vehicles

This practice is very apparent in various cities where the public transport is insufficient and not reliable, because the employers worry on the arrival of their employees at time. The same is observed for private schools.

3.2.4. Public transport infrastructure in urban areas

Very few public transport dedicated infrastructures are present in African cities: some rail infrastructures and some interchange stations between urban and interurban road transport routes.

New projects are emerging very progressively, either rail or bus lanes. But no metro or tramway has been yet implemented in the FSSA cities.

18. Systra, 2006.

19. Certu, 2002.

The public transport service is very dependant on the roads state which is often bad, although improving.

3.3. Impacts and challenges of public transport in urban areas

The impacts of the failure of public transport are both the development of the parallel supply of informal transport and an insufficient satisfaction of travel needs of urban populations. The absence of structuring mass transport is also a supplementary obstacle to structure the urban development.

The challenges are huge, they can be summarized by the need to develop a public transport supply which meets a meaningful share of travel needs. That concerns first the bus companies which do not play now the role they should play in a vision of sustainable cities. One needs to improve the efficiency of these companies, and to identify the right status (in terms of relationships with public authorities) which would permit them to be viable and sustainable.

In addition, the challenge is also to find new projects ensuring mass transport at a reduced cost: without being a panacea, bus rapid transit solutions have to be analysed, and implemented only if favourable conditions are present. Whatever the case, priority measures for buses have to be introduced in traffic management schemes.

A specific challenge deals with the preservation of railway services in urban areas when such infrastructure exists. Even if the immediate feasibility of urban train services appears to be negative, the possibility of such mass transport solutions in the future when the context will be more favourable should be preserved.

More specific challenges can be summarized as:

- Old buses are often polluting and not energy efficient.
- The second hand vehicles have to be considered as a step in a strategy of development but have to be complemented by the purchase of new vehicles.²⁰
- Safety problems related to bus operation, in particular appropriate training for drivers.

20. Arguments are given by Trans Africa Consortium 2010, pp 16–17.

4. Informal Motorized Transport

According to UN-Habitat these privately operated, small-scale services are varyingly referred to as ‘paratransit’, ‘low-cost transport’, ‘intermediate technologies’, and ‘third-world transport’. In French, the word ‘*artisanat*’ has been proposed and is now often used. The term adopted in this study is ‘informal transport’. That reflects the idea that this sector is not or little organized by the public authorities and it operates with constant transgression of some rules even if they respect a part of them. Another characteristic is that they offer by nature an unscheduled service in addition to the public transport operated by institutional firms.

4.1. Brief overview of informal transport kinds

The informal motorized transport will be examined in distinguishing three kinds of vehicles which are used: motorcycle, private car (for shared taxis), minibus the capacity of which can vary from 12–15 seats (microbus) to 18–25 seats (minibus strictly) and 30–45 seats (midibus). Modal share data show clearly that the informal transport is the main mode of transport in FSSA (see Table 9).

Table 9. Share of public transport forms in travel in ‘Francophone’ Sub-Saharan Africa in 2000

City	Share of public transport (per cent)						Total public transport
	Institutional transport	Informal/ <i>artisans</i> (small size operators)				Total informal	
		Motor-cycle Taxi	Metered Taxi	Shared Taxi	Minibus		
Abidjan	32	–	18	21	29	68	100
Bamako (1993)	10	–	-	-	90	90	100
Conakry	3	–	–	52	45	97	100
Cotonou	2	90	2	-	6	98	100
Dakar	5	–	10	15	70	95	100
Douala	2	30	–	60	8	98	100
Lomé	–	55	–	35	10	100	100
Niamey	19	–	–	81	–	–	100
Ouagadougou	25	–	–	75	–	75	100
Yaoundé (1993)	–	–	5	95	–	100	100

Source: Godard, 2006.

Minibuses are generally the most important vehicle and they are present in each city, at the exception of Cameroon, where they have been forbidden in order to avoid competition with SOTUC, the bus company. When SOTUC disappeared in 1994, the regulation excluding minibuses was kept until in the 2000s. The same exclusion scheme of minibuses is still present in Ouagadougou.

Shared taxis are present in the majority of cities: the most famous case is *woros woros* in Abidjan, which are adapted to deservng the neighbours inside the districts. One observes also often the presence of illegal taxis (*clandestine*) in many cities but it is difficult to estimate their importance as by definition their activity is not registered.

Motorcycle taxis are very present in some FSSA cities, particularly:

- Cotonou (Benin): *zemidjans* (60,000).
- Lomé (Togo): *zemidjans* (about 30,000).
- Douala (Cameroon): *ben skins* (30,000).

Motorcycle taxis are however absent in Sahelian cities where motorcycles are frequently used as an individual mode of transport, particularly in Ouagadougou and Bamako.

4.2. Trends and conditions of informal urban transport

4.2.1. Minibuses

The minibus (this generic term is used for various vehicles sizes) operated on an informal basis according to UN-Habitat terminology are very often the main mode of public transport. One observed a rising trend of this share in the cities which benefited from a bus company in the 1980s and 1990s before their crisis. (Abidjan, Dakar, Douala, Kinshasa, Yaoundé), but reliable data are missing.

In Dakar,²¹ the minibuses are very dominant as they represent 67 per cent of motorized trips in 2000. Two kinds of vehicle are operated:

- *Car rapide SG2* (40 per cent): old Saviem, 23 seats.
- *Ndiaga Ndiaye* (27 per cent): Mercedes, 30–35 seats.

Each vehicle is operated by a driver who has to give daily the owner a fixed amount of money, usually in the range of 15,000–18,000 CFA francs (US\$28– US\$34). He keeps and shares with the controller the surplus of receipt.

Many informal activities are linked to the transport operation and contribute to the employment of numerous workers (a total of around 30,000 workers was estimated in the 1990s):

- *Coxeurs* or *touts*: people who try to attract potential passengers at stations.
- *Changeurs*: people who provide small change for the operators of the informal vehicle operators at stations (normally at a fee of 10 per cent).
- Cleaning, maintenance and repair of vehicles.
- Rebuilding of new vehicles.

These informal transport modes are well inserted in the social urban reality of FSSA cities even if population can criticize the aggressive driver behaviour and the lack of safety or other service deficiencies. Their operational status is legal, as the vehicles are licensed. Usually the owners have to be registered and to pay a tax every year (or every six months) for each operated vehicle. One exception is Dakar where the license tax is paid once. But another characteristic of this sector is that a meaningful share of vehicles does not respect all the rules they have to fulfil (technical control not well implemented, insurance default; one license can sometimes be used for several vehicles).²²

In the majority of cities there are unions which introduce some organization in the sector. They are mainly routes unions, managed by drivers groups, which organize the departure of vehicle at the terminal stations. The driver has to pay a contribution to the union for its registration (usually yearly) and for each vehicle departure. The driver also has to pay the tout

21. Godard, 2007.

22. Observations confirmed by surveys on Abidjan case: SITRASS, 2000.

Figure 7. Minibus *car rapide* in Dakar, Senegal

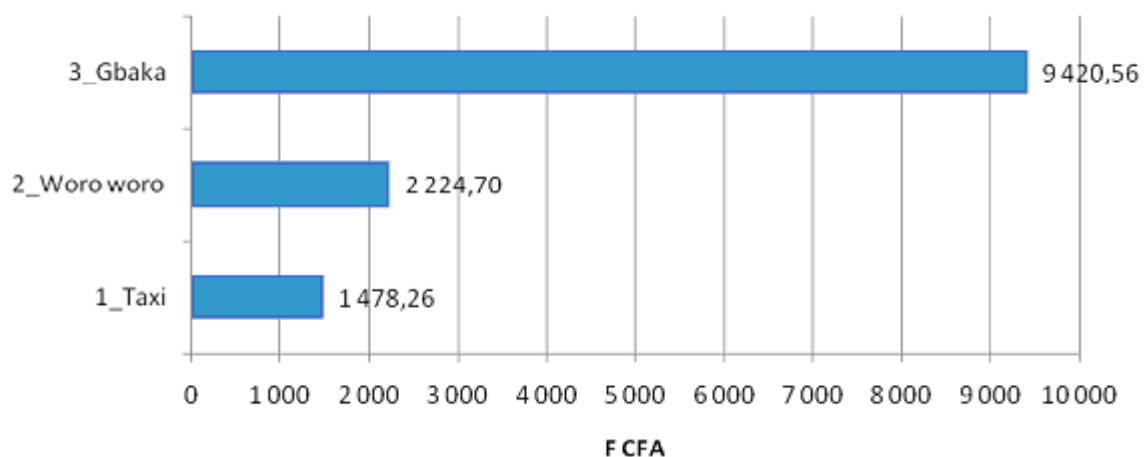


Photo: Godard, 2008.

who helps to catch and thus to fill the vehicle with passengers. But in practice, there can be problems of violence and rackets with young people who impose their presence to get money. In some cities, such as Abidjan, all these payments are criticized as they are too important and look like a racket from unions.²³

The informal transport is submitted to racket practices from the police in many cities. The estimations made in Abidjan show huge amounts paid to the police (see Figure 8).²⁴ But this practice is a source of violence when a control of a *gbaka* or a *woro woro* is aggressive: deaths (drivers or passengers) induced by these controls are periodically mentioned in newspapers.

Figure 8. Daily amount of payments to the police (racket) in Abidjan, Côte d'Ivoire



Source: Bamba 2009.

23. Kassi, 2007,

24. Bamba, 2009,

In Dakar, the payments to the police by the drivers have been estimated to 450,000 CFA francs (US\$900) yearly, or 5 per cent of the total operating cost.²⁵ This problem was the main cause of a strike (two days) of drivers in Dakar in January 2005 opposed to the reform of road regulation (*code de la route*). The drivers feared increasing cost of the informal fines they would have to pay after the reform as the official penalties were increased in case of infraction. The power of the unions is periodically demonstrated so that the authorities hesitate to apply strong decisions concerning the urban transport in Dakar.

4.2.2. The shared taxis

The general FSSA trend of shared taxis seems to be their consolidation in a multimodal scheme where buses and minibuses are present. In Abidjan²⁶ *woros woros* seem adapted to serving the local neighbourhoods, i.e. those that cannot be served by SOTRA buses nor by minibuses (*gbakas*). The licenses are, formally speaking, given only for internal services and not for inter-districts routes, but this rule is not always applied and some districts have delivered licenses for inter-districts routes. These shared taxis are a very popular means of transport for short trips (51 per cent of positive opinions, against 32 per cent for *gbakas* and for buses) they have consolidated their influence, even if the safety problem is criticized by users as it is suggested by Table 10 (nevertheless less than for *gbakas*).

Table 10. User criticisms on the transport means in Abidjan, Côte d'Ivoire

	Late (%)	Unreliable (%)	Bus state (%)	Safety (%)	Total (%)
Bus SOTRA	35	32	17	15	100
Minibus (<i>gbaka</i>)	2	2	26	70	100
Shared taxi (<i>woro woro</i>)	1	4	52	42	100

Source: Zoro-Fofana, 2007.

4.2.3. Motorcycle taxis

Motorcycle taxis were absent in 1990s in the majority of FSSA cities, but the remaining crisis of public transport and the bad conditions of roads in peripheral areas are factors leading to the extension of motorcycle taxi services in many cities. Motorcycle taxis are present in the following cities:²⁷

- Bangui (Central African Republic) since 2005.
- Bujumbura (Burundi).
- Kigali (Rwanda).
- Kinshasa (DR Congo) since 2007.
- N'Djamena (Chad).
- Yaoundé (Cameroon).

25. Godard, 2007.

26. Zoro, 2007 pp 135–140.

27. Trans Africa Consortium, 2008.

The main factors of motorcycle taxis' success have been identified as:

- crisis of public transport supply obliging to find an alternative;
- rapidity and door to door service, which are elements of quality of service even if other elements are negative (comfort and safety); and
- affordable fares due to low prices of vehicle and gasoline (proximity of Nigeria for Cotonou and Lomé, and new cheap Chinese motorbikes imports).

In Cotonou the regulation of motorcycle taxis (*zemidjans*) is expressed by various municipal or prefectural orders:²⁸

- drivers are obliged to wear a yellow blouse;
- registration at the municipal office;
- registration number has to be printed on the blouse;
- driving licence necessary for the driver;
- insurance certificate;
- helmet wearing is obligatory; and
- monthly operating tax of 400 CFA francs (US\$0.85), since 2003 (initially 600 CFA francs), to be paid at the municipal office.

The payment of the motorcycle taxis taxes is not well applied for practical reasons: time wasting, bureaucratic impossibility to manage the collection of so numerous taxes (around 60,000 or more motorcycle taxis in Cotonou).

4.3. Impacts and challenges of informal urban transport

The main advantage of informal transport is that it offers an adaptable transport service, meeting the needs of most population groups .

From a financial point of view it permits, in principle, a private funding of transport supply and does not make pressure on public finances through subsidies, with exceptions when authorities bring some support to favour the purchase of new vehicles respecting safety and environment norms. At the contrary, it feeds public finances through the taxes for vehicles licences and other taxes. The main contribution to the State resources of the informal transport comes from the fuel taxes paid daily (at the exception of smuggled fuel in countries around Nigeria).

One advantage of this kind of transport, in the context of unemployment in these cities, is that it provides employment to many people, particularly to young people who would otherwise be unemployed. The extreme situation is given by motorcycle taxis as the ratio is one driver for one passenger: some estimates give more than 60,000 workers in Cotonou (a city with just under 1 million inhabitants²⁹). Beyond its transport contribution, the informal transport plays a role of social integration and of social protection net.

But the disadvantages are also numerous, particularly:

- The lack of safety, attributable to the vehicles characteristics (bad maintenance of brakes, tires, etc.) and to driving conditions (long daily working period, aggressive driving behaviour for picking up a maximum of passengers, etc.).

28. PDM, 2007.

29. United Nations, 2010.

- The pollution. For instance in case of motorcycle taxis a high level of pollution comes from the use of two stroke engines and of an oil (lubricant) excess in the fuel.
- Congestion on the main roads where the most profitable routes are concentrated, attracting too many informal transport vehicles.
- Cost for users when they are obliged to use two or three vehicles for one trip, as drivers tend to cut the routes in smaller ones, especially in peak periods.
- Sometimes a bad quality of service (long waiting time in off-peak periods: rule of vehicle departure in a terminal only when the vehicle is loaded enough).
- Stopping everywhere on streets for picking up new passengers: it is a factor of congestion and reduced safety.
- The rule of departure in terminal which gives an equal chance to each vehicle without consideration of its quality level (*tour de role*).
- Too many low capacity vehicles in dense areas reinforce congestion and pollution problems.

Data from Abidjan illustrate the involvement of informal transport in accidents.³⁰ The minibuses *gbakas* are involved in around 10 per cent of all accidents, but their share in deaths and injuries is higher (14 per cent and 18 per cent) (see Table 11). The shared taxis are also very involved in accidents: around 25 per cent of accidents. In Yopougon (Côte d'Ivoire) they represent around 90 per cent of accidents and almost all the deaths in these accidents. Nevertheless one should need to refer to their share in traffic or in trips to appraise the comparative insecurity of modes.

Table 11. Accidents involving minibus *gbakas* in Abidjan, Côte d'Ivoire (1999–2002)

Year	Accidents			Deaths			Injuries		
	Total Abidjan	<i>Gbakas</i>		Total Abidjan	<i>Gbakas</i>		Total Abidjan	<i>Gbakas</i>	
		Number	%		Number	%		Number	%
1999	2,413	261	10.8	171	21	12.3	3,983	830	20.8
2000	2,966	318	10.7	155	27	17.4	4,138	733	17.6
2001	3,351	340	10.1	191	25	13.1	5,243	877	16.7
2002	3,269	371	11.3	154	25	16.2	5,111	907	17.6

Source: Kassi, 2007.

30. Oser, AGETU, 2005 in Kassi, 2007.

5. Private Motorized Transport

This chapter examines the role of private cars and of motorcycles.

5.1. Brief overview of private motorized transport importance

Private motorized transport is defined as all motorized transport means designed and used from an individual purpose. Several persons can be transported together inside one vehicle on the basis of personal relationships.

Car ownership is very low in most FSSA countries by international comparison. The available estimates reveal rates around 10 cars per 1000 inhabitants in many countries: for example rates of 16 in Benin, and 15 in Senegal. In some countries rates are very low at around 1 or 2 cars per 1000 inhabitants: for example rates of 0.3 in the Central African Republic, 1.6 in Togo, 2.2 in Rwanda (see Table 12).

Table 12. Passengers cars per 1000 inhabitants in 'Francophone' Sub-Saharan African countries

Country	2002	2007
Benin	13	16.54
Burkina Faso	N/A	6.57
Burundi	N/A	1.82
Cameroon	10	N/A
Cape Verde	N/A	67.40
Central African Republic	1	0.28
Comoros	N/A	30.63
Congo	8	14.87
Côte d'Ivoire	7	N/A
Guinea-Bissau	N/A	26.80
Mali	N/A	7.05
Niger	3	N/A
Rwanda	N/A	2.19
Sao Tome and Principe	N/A	1.93
Senegal	N/A	15.15
Togo	N/A	1.61

Source: World Bank, 2010.

But private cars fleets are concentrated in the cities, and the capital cities gather a large part of the national fleet in probably all countries. The estimates are that 77 per cent of the Ivorian fleet is located in the Abidjan region,³¹ 78 per cent of Senegalese fleet in the Dakar region.³² Therefore car ownership in these cities is higher, even though still at a low level: a very recent estimate for Yaoundé (Cameroon) gives a car ownership rate of 20 cars per 1000 inhabitants.³³

31. Certu, 2002.

32. Gueye et al, 2009.

33. Berger, 2010.

Private car represents a low share of urban trips in the modal split: in Abidjan, the most motorized city in FSSA in the 1990s; its share was estimated to be about 8–10 per cent of total trips in 1998, or less than 20 per cent of mechanized trips. In Dakar this share was 11 per cent of mechanized trips in 1997.³⁴ In other less motorized cities this share is lower.

One observes a significant use of motorcycle as a private mode in Sahelian cities (Bamako, Ouagadougou, Niamey) and in coastal cities (Cotonou, Lomé). Ouagadougou is the most famous African city for its use of private motorcycles (more than 50 per cent of mechanized trips). In other cities this use is negligible: only 2.3 per cent of households are equipped with motorcycles in Yaoundé.³⁵

5.2. Trends and conditions of private motorized urban transport

The trend is a significant increase of car fleets in cities, but the rate of households car ownership seems to have been stable at a low level as the urban population is increasing rapidly at a rate similar to that of the car fleet. Another factor in the increasing number of cars is the fact that many cars are owned by administrations, enterprises or NGOs, although precise data are missing to monitor this phenomenon.

In terms of vehicles fleet evolution, Côte d'Ivoire was one of the most dynamic countries in the 1980s and 1990s. But the rate of increase has slowed down in the 2000s as revealed by Table 13, due to the political and economical crisis. Finally the number of vehicles was multiplied by almost 4 in 15 years (1993–2007). Similar trends of increase for the whole period 1990–2010 seem to characterize the majority of countries which have liberalized the import of vehicles.

Table 13. Evolution of vehicles fleet in Côte d'Ivoire

Year	Car fleet	Annual rate of increase (%)
1993	121,833	
1994	140,022	13
1995	158,203	20
1996	189,868	20
1997	227,075	20
1998	256,883	13
1999	292,429	14
2000	311,460	7
2001	331,711	7
2002	350,842	6
2003	376,307	7
2004	407,998	8
2005	428,133	5
2006	447,458	5
2007	474,873	6

Source: Bamba, 2009.

34. Kumar and Diou, 2010.

35. Berger, 2010.

Figure 9. Overloading of a motorcycle in Lomé, Togo



Photo: Guezere, 2008.

The determinants of motorization in FSSA are classical: the income level can be clearly considered as the most important factor for private car ownership. The urban sprawl and associated lifestyles do not seem to be the major factors explaining motorization in FSSA countries because the urban sprawl concerns mainly the urban poor obliged to find housing far from the city centre or in landlocked areas.

One important factor to understand the car market and its dynamics is the second hand vehicles import policy: in the 1990s there have been import liberalization policies – imposed by the World Bank and the International Monetary Fund (IMF) – in the African countries. It made it easier and cheaper to buy a car (or a minibus) and many households had access to private cars, through the buying of a second hand vehicle. The market for new vehicles was totally depressed in this period and was reserved to some specific buyers (administrations, firms, NGOs).

The import of second hand vehicles has increased the age problem of car fleets. In average the age of vehicles was estimated to 11 years in Côte d'Ivoire in 1998.³⁶ Some countries have corrected the negative effects of the total liberalization of imports in the 2000s, by introducing an age limit on such imports (Senegal).

The technical control of vehicles is in principle obligatory in every country in the UEMOA region, as it was confirmed by a recent directive in September 2009.³⁷ It is also considered to be a means of improving the characteristics of the fleet and an attempt of eliminating too old poorly maintained and dangerous vehicles. But the experience reveals that the disposal of old vehicles is not very efficient in many countries.

36. Certu, 2002.

37. UEMOA, 2009.

One interesting case is Abidjan with Sicta, a private firm mandated (concession contract) to implement the technical control imposed by law.³⁸ There has been an improvement of technical control procedure, yet many vehicles remain without any technical control:

- 72 per cent of fleet is estimated to have been submitted to technical control, 28 per cent have escaped it.
- 28 per cent of vehicles at their first visit do not satisfy the criterions to get the certificate of technical control. But there are no means to take them out of circulation.

Data on motorcycle ownership by city are difficult to get. But data on motorcycle usage express the importance of this mode in some cities.

Motorcycle ownership and use seem very developed in some cities: in the case of Sahelian cities: in Bamako, Niamey, Ouagadougou it is used only for private use and not for taxi. But in coastal cities (Cotonou, Douala, Lomé, etc.) motorbikes can be used either for private trips or for taxi service. The motorcycle is considered as a substitute to the private car for people who cannot afford to purchase a car. This means that motorcycle users tend to become car users when their income level increases: these users risk being lost for the public transport services.

For motorbikes, the influence of income plays its role but other specific factors appear in some cities: Ouagadougou is known as a city with many motorbikes even though its people have low incomes. Old data³⁹ illustrate this point: in 1992, the rate was 150 motorbikes per 100 households, 72 per cent of households had more than one motorcycle. It was due to a tradition of two wheeler use, but also to the presence in Burkina Faso of an industry of building motorbikes with an efficient commercial mechanism (loans to employees with reimbursement directly taken on wages). The availability of cheap Chinese motorbikes in the 2000s has removed this favourable factor in Ouagadougou and in many other cities.

5.2.1. Conditions and trends of infrastructure for private motorized transport in urban areas

Thanks to international funders, highways and roads are progressively built in urban areas. But the speed of construction is not rapid enough to adapt the infrastructure to the new travel needs coming from the urban growth.

5.3. Impacts and challenges of motorization

Although motorization is low, the negative impacts of motorized transport are very present in FSSA countries: congestion, pollution, and accidents.⁴⁰ But these negative externalities cannot be attributed only to private cars and motorcycles as other kinds of vehicles are very present in the traffic and are responsible also of negative impacts: minibuses, taxis, and trucks.

These negative impacts are reinforced by the great age of cars fleets, so that one challenge is to modernize progressively, with vehicles conforming to norms of pollution and safety.

There is no auto dependency in a strict meaning because private cars are very in minority in the modal split: the major part of urban population never uses a car. But often the taxi can

38. Bamba, 2009.

39. Cusset et al, 1995.

40. See analysis and data in chapters 9 and 10.

play an important role as a substitute, particularly in case of emergency. Nevertheless, the positive image of private car for social reasons introduces an ideological car dependency which is of course very represented by the higher-income groups.

The main challenges for the future are the capacity to manage the unavoidable increase of vehicles on urban roads networks, through the regulation and its enforcement to get less polluting and safe vehicles. A component of any policy deals with the introduction of parking management policies, which are currently not well developed. More generally, the challenge is to limit the growth of motorization (household car equipment) by introducing efficient public transport.

Another important challenge deals with motorcycles, the use of which tends to develop very rapidly. This transport mode is very efficient from an individually point of view, but at a cost for the community (safety, pollution, and energy): a cautious policy has to be applied to regulate its use and to limit it in dense urban areas.

6. Commercial Goods Transport

Commercial goods transport is not well documented in FSSA countries. Thus, only a few selective elements are given in this chapter.

6.1. Brief overview

Two kinds of commercial goods transport issues can be distinguished:

- Commercial goods transport directly generated by the current urban life, and particularly food in the markets. This transport is a component of the activity in the city, where one can distinguish the import of goods from outside the city and the intra-urban transport for the final distribution of goods in the urban space.
- Transit transport of goods linked to international trade: that concerns particularly movements linked to the port activity when the city is located on a coast (Abidjan, Conakry, Dakar, Douala, Lomé, etc. But also the inland cities can have to manage goods transit traffic.

In the case of ports, the transport of goods generated by the port activity is the most important component, mobilizing high capacity trucks movements.

6.2. Trends and conditions in commercial goods transport within urban areas

Concerning the transit transport involving truck movements, the cases of Cotonou and Lomé reveal the difficulties to have an integrated approach to urban management.

In Lomé⁴¹ the absence of a bypass road around the city obliges the trucks leaving the port area to go through the city in direction of North, which is sometimes a cause of trouble in case of a break-down or accident. The parking of trucks is also a problem not well solved when they have to wait for administrative procedures with the customs (as the borders with Benin and Ghana are very close).

In the case of port activity, there needs to be coordination between the City Council, the Ministry of Transport and the Port Authority. But this institutional cooperation is difficult to get. In order to get a better coordination, the Cotonou municipal authorities have pledged to be a member of the Port Authority Board, but unsuccessfully.⁴²

One specific aspect deals with the import of vehicles, particularly private cars, due to the high demand for cars. That has induced the development of ports activities specialized in the vehicles import, with dedicated areas for parking vehicles before customs procedures. Lomé and Cotonou have a high activity of this kind, which can involve some traffic difficulties as the port is located close to the city centre. The ports of Abidjan, Conakry, Douala, Pointe Noire (Congo) also have the vehicles imports in their field of activity.

Concerning the intra-urban transport of goods, it is very linked to informal activities of retailing: many small informal trading activities are a backbone of the urban life in FSSA cities. These activities are made in majority by women who need to organize the transport of goods they buy in specialized markets and sell in specific places like the city centre or in their dwelling surrounding. They often use taxis for this purpose, bargaining the fare for each trip. One observes also some practices of women grouping to get a taxi and share the price of the trip.

41. Seddoh, 2002.

42. Yeou, 2002.

In Abidjan⁴³ specific surveys on a sample of 600 saleswomen reveal the mode they use for their activity (see Table 14): The most important is the metered taxi (45 per cent). The bus company SOTRA covers only 16 per cent: 12 per cent with buses and 4 per cent with minibuses specialized in luggage transport and deservng the markets.

Table 14. Transport mode used by saleswomen in Abidjan, Côte d'Ivoire

Mode used	%
Bus SOTRA	12
Minibus 'luggage' SOTRA	4
Truck	10
Minibus (<i>Gbaka</i>)	19
Metered taxi	45
Shared taxi (<i>woro woro</i>)	5
Others	5
Total	100

Source: Zoro-Fofana, 2007

An analysis of goods transport was proposed on FSSA cities some years ago inside a FAO initiative.⁴⁴

One observes the importance of non-motorized transport to supply the markets in some cities like N'Djamena, where carts and rickshaws are mobilized to transport the food products unloaded from barges on the Chari River to the central market or the Millet market. Such non-motorized vehicles are also used in Antanarivo where the rickshaws are very present to transport goods between markets, but they are in competition with motorized vehicles. They keep an advantage in the hilly areas without asphalted roads.

In other cities like Conakry, one observes also a complementarity between motorized and non-motorized vehicles: shared taxis, minibuses and light vans or trucks are used to transport goods between the central market of Madina, the secondary wholesale markets, and the retail markets. A similar scheme based mainly on motorized vehicles is observed in Dakar where the most important fresh food market is located at Thiaroye along the railway (when a train is arriving at the station the traders leave the track for a short while before reinstalling their products on the track after the train departure). This market is served by various motorized modes (taxis, minibuses, even the urban train). Minibuses are mobilized to carry many things towards small retail markets disseminated in the city.

No major cost differences were registered between motorized and non-motorized vehicles, but it is clear that the efficiency of trucks increases with the load and the distance when the non-motorized transport is efficient and cheap for short distances and small quantities.

6.3. Impacts and challenges of commercial goods transport in urban areas

Trucks movements inside the urban areas involve many negative impacts which requires management and regulation: difficult insertion in traffic, too large vehicles in some narrow streets; safety risks with other users, particularly pedestrians and motorcycle users.

43. Zoro ,2007, p 253.,

44. Wilhem, 1997.

Figure 10. Truck with container is parking in Dakar centre (Plateau) (Senegal)



Photo: Godard, 2010.

Parking of trucks is another important challenge in the surroundings of the ports because trucks are forced to wait for loading during a couple of days and sometimes one or two weeks, or more. Illegal but tolerated parking practices along some roads close to the port area reduce the capacity available for other traffic and lead to more congestion.

An important challenge would deal with the high cost of goods transport inside the urban area, and particularly the cost of food transport as it conditions much the cost of life: food is usually the main expense in household budgets with a share of more 50 percent for the poorest groups.

One observation made many years ago,⁴⁵ revealed a very high increase of food prices from the field where the product is harvested, the wholesale markets where they are sold to retailers and the small markets where households access by walking to get daily the food they need. It is also linked to the trade structure, but the internal transport of goods (mainly food) appears costly in African cities, as retailers frequently use taxis for transporting their products.

45. Unpublished work by the author in Brazzaville in the 1980s.

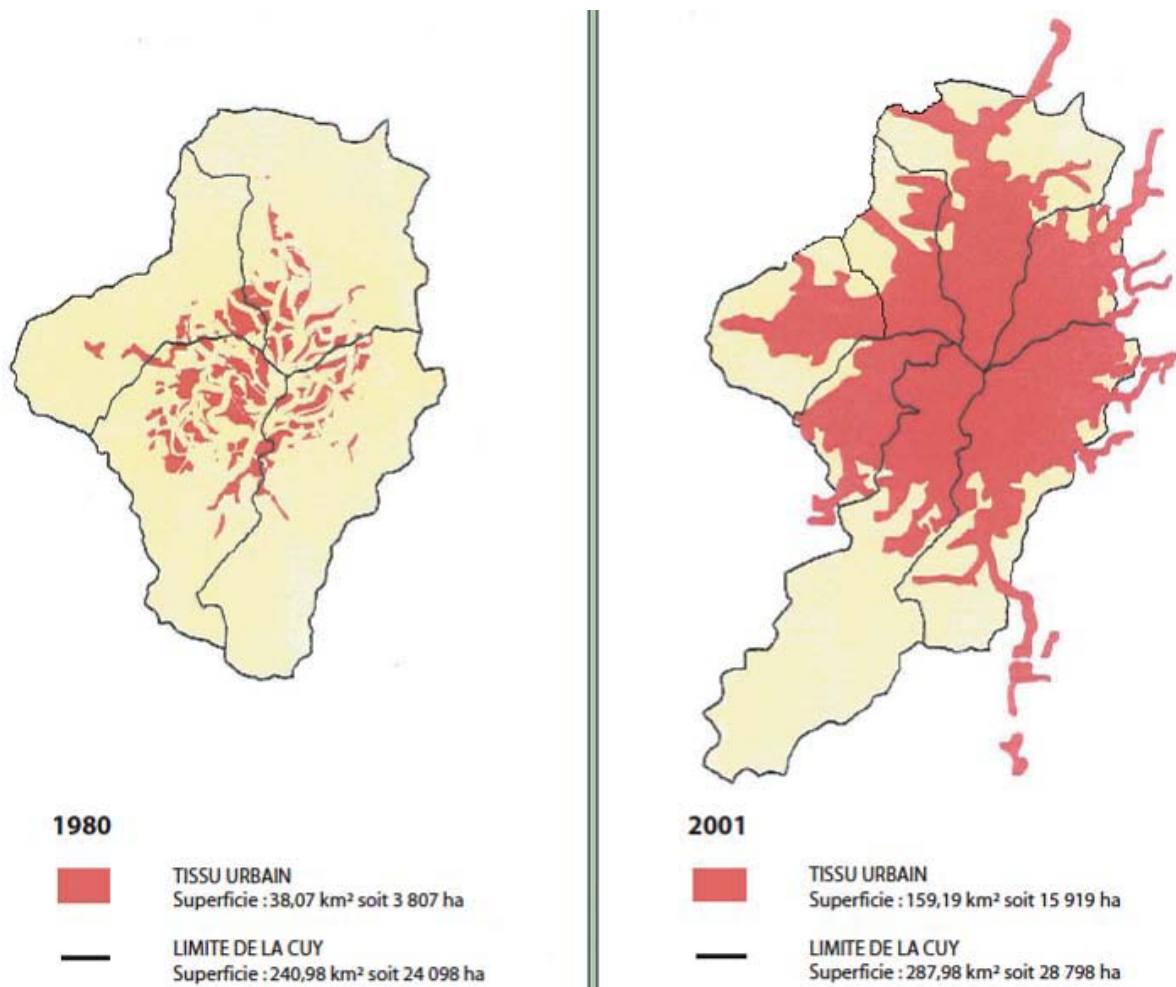
7. Land-Use and Transport Planning

Land-use and transport planning is an important and difficult matter as the status of urban planning is very uncertain and rough. This chapter examine mainly the case of Dakar.

7.1. Brief overview

The urban sprawl linked to a rapid urban growth which is observed in all the cities can be exemplified by the case of Yaoundé (see map in Figure 11):

Figure 11. The evolution of urbanization in Yaoundé, Cameroon



Source: *Communauté Urbaine De Yaoundé: Yaoundé 2020, Plan Directeur d'Urbanisme*, Augea International-Iris Conseil-Arcauplan, 2008, cited in Berger, 2010.

The urban structure of Dakar illustrates the unsustainable travel structure, which is too much focused on the historic centre called Plateau. Dakar is composed mainly of three poles:

- Dakar city (42.2 per cent of population and also the large majority of services and employment).
- Pikine-Guediawaye (45.3 per cent of population) located about 10km from Dakar centre. It is sometimes considered as a twin city.
- Rufisque (12.5 per cent of population) located about 25km from Dakar Plateau.

This organization implies that trips are focused on Dakar centre, leading to congestion and long trips from the periphery to the centre.

New activities poles have merged at the periphery of Dakar centre (Plateau):

- industrial zone *Sodida*, benefiting from the proximity of the port;
- *Triangle Sud*, and *Point E*, welcoming administration and services;
- Rufisque Road, the main road axe of exit from Dakar (before the new highway);
- Guediawaye; and
- Diamniado considered as a new town, near Rufisque.

To cope with this urban growth, urban master plans are usually designed and in parallel transport plans are sometimes proposed. A new kind of transport plan has been introduced in FSSA cities in the 2000s, inspired by the French experience: urban mobility plans (PDU, *Plan de Déplacements Urbains*) which deal with all travel modes, walking, individual modes, and collective transport. The aim is precisely to give each mode the conditions and the limits for its efficient use, and to state the priorities.

Few FSSA cities have actually implemented such plans, but many cities come progressively to the idea to design and to implement them.

The case of Dakar is meaningful as planning is present: An urban development plan (PDU, *Plan de développement urbain*) and an urban mobility plan (PDUD, *Plan de Déplacements Urbains de Dakar*) have been elaborated or updated in the 2000s. But the implementation of plans is threatened by many difficulties.

7.2. Conditions and trends of integrated urban land-use and transport planning

In the case of Dakar, the new trends of urbanization are not well coordinated with mass transport projects.

The Public Transport Master Plan elaborated in 1998 considered the existing railway line as the backbone of the public transport network on the basis of an urban development in peripheral cities of Rufisque and Bargny. But the real dynamics of urbanization were not along this line but further to the north in areas not served by the railway.⁴⁶

The extension of metropolization process is making the city of Thies (about 300,000 inhabitants), located 70km from Dakar, progressively integrated in a vast metropolitan area.⁴⁷ Difficulties to find affordable housing in Dakar has encouraged some households to live in Thies – which is well equipped with infrastructures and urban services – although they work in Dakar. That involves very long trips of at least one hour but often two hours during peak period (3 to 4 hours daily). Trips are made by minibus or by shared taxi or even by hitch-hiking.

In line with the updated urban plan a new city has been designed in Diamniadio (40km from Dakar) at the initiative of the Senegalese President in order to structure the urban development in the periphery of Dakar. Its location between Dakar and Thies gives it the possibility to be a junction point of transport networks (railway line, national roads and a future toll highway). Being originally a rural area Diamniadio was established as an administrative district in 2002. The project is to develop both housing economic activities, particularly industry activities and services: and a new university is planned. A terminal port

46. Godard, 2002a.

47. Diaw, 2009.

is planned to alleviate the overloaded port of Dakar. But the implementation of the development projects is subject to financial constraints and international negotiations for getting loans, so that they are partly postponed. In short this new town attempt is based first on the new toll highway which will give it a good accessibility and not on the railway line even if it is present.

Another question of planning is the enforcement of urban planning and particularly for transport infrastructures (land in reserve and to keep inbuilt for future transport infrastructure). This question is worrying because informal (and sometimes formal) dwellings are built illegally (sometimes authorized in contravention to urban plans) on road or railway reserves. That leads to future difficulties and costs to build such new infrastructures.

An interesting example illustrates what can be done for a good integration management of a new transport project in the built environment: The Dakar Thies toll highway (partly World Bank funded) is under construction after studies and cautious procedures for managing the houses expropriations and preserving the accessibility of the crossed areas.⁴⁸ The toll highway Dakar to Diamniadio (and then to Thies) was decided by president Wade and managed by APIX (*Agence nationale pour la Promotion des Investissements et les Grands Travaux*). It is a public-private partnership project.

The investment is estimated at 380 billion CFA francs (US\$530 million), the first urban links have been funded by the Senegalese State and the following links funded by a loan from many funders including the World Bank (US\$105 million) and the Agence Française de Développement (AFD). These funders have focused their involvement on the mitigation of negative urban impacts of this major infrastructure.

- Area of new settlement in Tivaouane Peulh to welcome the displaced populations (estimated to around 3000 households, 20,000 inhabitants) following expropriations related to the construction of the highway. It includes provision of public services and the displacement of a waste management unit in Mbeuheuss.
- Restructuring the area of *Pikine irrégulier sud* (around 250,000 inhabitants).
- In complement new road accesses to the highway in Dakar.

Detailed surveys and analysis of local accessibility have been implemented to design the adapted road development inside the impacted areas (accessibility approach instead of traffic flows management, hierarchy of road networks).

The displaced populations are, however, opposed to the proposed amount of compensation by APIX. They claim 22,000 CFA francs per square metre compared to the 17,000 CFA francs proposed in the case of housing informal tenure (in case of formal tenure, people will get 40,000 CFA francs per square metre).⁴⁹ This conflict illustrates the permanent difficulty of land regulation (most households have built illegally on reserved places) involves delays and expanding costs in infrastructure projects.

The example of Conakry⁵⁰ also illustrates the lack of implementation of integrated plans when they exist. The city has developed along the three main transport axes in a linear scheme as it is built on a peninsula. The Administrations are concentrated in the extremity of this peninsula, and the port also, what involves congestion and difficulties of access. The urban master plan, designed in 1989, presented some options:

- a grid of roads to link the main urban areas;

48. Chenal et al, 2009.

49. Demonstration 10 October 2010 related by Najib Sagna in <http://fr.allafrica.com/stories/201010041631.html>.

50. Systra, 2006.

- the implementation of multifunction centres in the middle of the city, to balance the historic centre located at the extreme point of the peninsula which is difficult to serve; and
- a mass transport system with a possible dedicated bus lane replacing the available railway line.

However, few administrative activities have actually been transferred from the historic centre to new activities poles.⁵¹ The mass transport project has not been implemented because of the absence of political willingness and the collapse of Sogetrag, the bus company which would have supported this project.

7.3. Challenges of integrated urban land-use and transport planning

The trend towards urban sprawl involves well known transport difficulties and negative impacts, which make the travel patterns unsustainable: increasing length of trips, deteriorated accessibility, high cost of public transport services in peripheral areas, etc. This trend can be channelled towards more structured urban schemes through planning efforts.

The first challenge is therefore to combine urban planning and transport planning in order to design strategic options. As the culture of mass transport is not yet present enough in the FSSA cities it is important to introduce it in planning efforts in order to make mass transport one component of such urban planning. The second challenge is to give the means to implement the options, and particularly to identify the financial means of mass transport investments.

The scarcity of information on linking land-use and transport planning in FSSA cities reinforces the need for exchanges and cooperation between transport and urban planners in the region.

51. For political and strategic reasons the President was reluctant to transfer administration in areas which would be more vulnerable to social and political riots.

8. Social Sustainability of Urban Transport

The travel conditions of the urban poor are examined in detail in this chapter which covers also some elements on the gender dimension and the worrying safety problems in urban transport.

8.1. Overview of social sustainability issues in urban transport

The mobility figures are based on basic indicators:

- Travel rate (motorized and non-motorized distinction): average number of daily trips per person;
- travel time: average trip time;
- travel time budget: total daily time spent in trips per person; and
- modal share.

Data examined below (see Tables 15–17) are drawn from a SITRASS study on poverty and mobility in Conakry and Douala.⁵²

Table 15. Overall travel characteristics of the poor in Conakry (Guinea), 2003

Group	Sedentarity rate* (%)	Travel rate**	Travel time budget (minutes)		
			Walking	Mechanized	Total
Student	8	4.0	48	27	75
Employed woman	10	3.9	50	29	79
Unemployed woman	21	3.0	33	25	58
Employed man	5	4.3	53	70	124
Unemployed man	23	3.4	34	34	68

* The 'sedentarity rate' is the proportion of people who did not travel during the surveyed day.

** The 'travel rate' is the average number of daily trips per person.

Source: SITRASS, 2004a, SITRASS, 2004b.

Table 16. Daily travel rates for the poor and non poor in Conakry (Guinea) and Douala (Cameroon), 2003

City	Conakry		Douala	
	Poor	Non-poor	Poor	Non-poor
Overall travel rate	3.8	3.9	4.4	4.8
Men	4.1	4.2	4.7	4.8
Women	3.5	3.6	4.0	4.3
Percentage walking	78	61	77	52
Percentage walking trips of more than 30 minutes	11	9	13	4
Motorized travel rate	0.8	1.2	1.0	1.9
Men	1.0	1.4	1.2	2.1
Women	0.7	1.0	0.8	1.5

Source: Godard, 2011.

52. SITRASS, 2004a; SITRASS, 2004b; Godard, 2011.

Table 17. Average travel time budget in Conakry (Guinea) and Douala (Cameroon), 2003

City		Average trip time (minutes)		Daily travel time budget (minutes)		
		Walking	Mechanized	Walking	Mechanized	Total
Conakry	Non-Poor	18	40	42	61	103
	Poor	15	44	44	36	80
Douala	Non-Poor	11	33	28	77	105
	Poor	14	37	46	37	84

Source: SITRASS, 2004a; SITRASS, 2004b.

These indicators reveal large differences of the mobility profiles according to gender and to age: women have a lower mobility rate than men (but difference is not so high) and walking is very dominant in their modal share.

The high cost of public transport fares for the household budget illustrated in Table 18 shows that they are not affordable for the urban poor. This is why the walking share is generally so important. That expresses a kind of vicious circle where the poor have a difficult access to jobs which are far from home. But the active people who get incomes enough to escape from their poverty condition are often obliged to spend much time for their trips, motorized and non-motorized ones.

Table 18. Share of transport expenditure in budget of poor households in Conakry (Guinea), 2003

Urban area of dwelling	Annual household income (US\$) ^a	Annual transport expenditure (US\$)	Share of household income spent on public transport (%)
Centre	960	152	15.9
First periphery	780	151	19.4
Second periphery	716	144	20.2
Third periphery	898	184	20.4
Accessible areas	900	154	17.0
Isolated areas	768	158	20.5

a. Revenues and expenses are converted from Guinean francs to US\$ on the basis of the official rate of 2000 Guinean francs per US\$ in January 2004 (parallel market change rate was approximately 2400 Guinean francs per US\$).

Source: SITRASS, 2004a.

Travel time budget are high but in the majority of cities they seem acceptable on average. Nevertheless the question of excessive travel time budget is accurate for a minority of employed people who are obliged to get a job very far from home.

In the case of Antanarivo, the daily use of a minibus *taxibe* would involve a high pressure on budget which makes it unaffordable for all the members in the majority of households (as illustrated by Table 19).⁵³ As a result, the *taxibe* minibus is mainly used by the working population, yet only 14 per cent of surveyed workers responded that they use the *taxibe* daily, while 18 per cent responded that they use it frequently.

53. Deville, 2008.

Table 19. Cost of a *taxibe* daily use by one person in Antananarivo poor areas (Madagascar)

Area	Inhabitants	Monthly resources (Ar)		Weight in monthly budget (%)	
		Individual	Household	Individual	Household
Anosizato Ants 1	9,325	20,455	61,365	64.5	21.5
Ambodivona	23,378	22,703	76,054	58	17.5
Imamba	(together)	28,730	121,788	46	11
Mahabo	2,994	26,922	94,226	49	14
Mahalavolona	4,829	38,742	142,885	34	9

Note US\$1 = 1700 Ar (Malagasy ariary).

Source: Deville, 2008.

8.1.1. Global conditions, trends and challenges with respect to the gendered dimensions of urban transport

Travel surveys confirm that the mobility profile of women is different compared to the men. The level of mobility tends to be lower but not so much. The main difference is the higher share of walking, which means a low level of motorized mobility.

Many women are involved as food traders in the markets, which involve trips to buy on a central market and to sell on a retail market. In Abidjan⁵⁴ these women use mainly the metered taxi (45 per cent), the minibus *gbaka* (18 per cent) and the bus SOTRA (12 per cent). Very few use the specialized *taxi baggage* operated by the bus company SOTRA designed for their needs.

8.1.2. Situation of people with reduced mobility

In a context generally not favourable to pedestrians, walking is more difficult for people with reduced mobility (blind, disabled, etc.). Their travel strategies and the obstacles to manage have been analysed in surveys and focus groups studies in Lomé, the main conclusions of which is that:⁵⁵

- The footpath which should be a secure space for pedestrians is often occupied by other users: traders' activities, vehicle parking, etc.
- Blind people need to distinguish footpaths and roads through the difference of their pavements and the existence of light bordures.
- The urban furniture like road-signs located on footpaths is a source of potential chocks.
- People with reduced mobility require safe itineraries, which have to be offered. This can be facilitated by traffic calming measures.

8.1.3. Trends and challenges of urban transport safety and security

Data on urban safety are not very reliable in urban areas. There are many reasons for this: cost reasons because people involved in an accident often have to pay the police for getting a statement of the accident; administrative reasons, the police has no time or no means to

54. Zoro, 2007.

55. Ahoomey-Zunu, 2009.

complete correctly the files in the appropriate format; social reasons, as sometimes people do not want to declare a death (do not want to make money from a death through insurance).

Accidents tends to be increasing with traffic growth. According to many analysts roads infrastructures are not well designed to preserve safety and to ensure the cohabitation of various transport modes with different speeds and driving characteristics. Safety problems have also increased in FSSA cities with relatively high densities of bicycles and motorcycles, as these modes are vulnerable in traffic conditions.

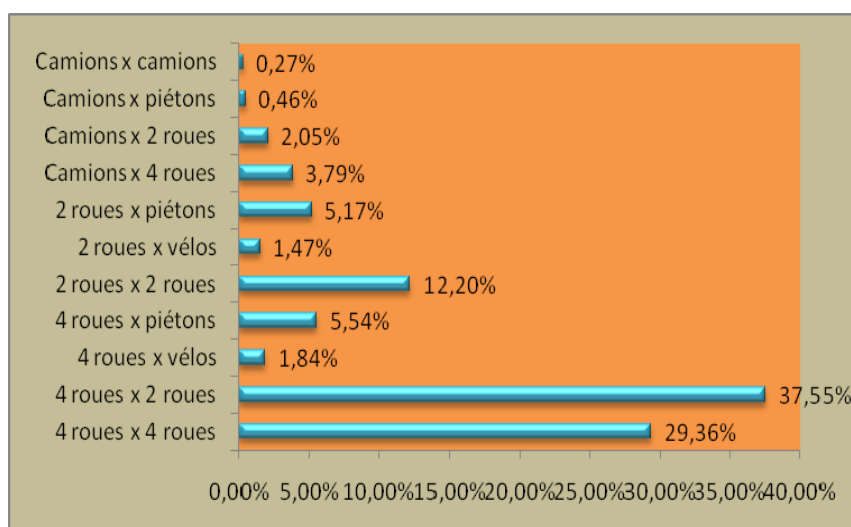
Table 20 and Figure 12 on Lomé,⁵⁶ as well as data on Ouagadougou,⁵⁷ illustrate the private car involvement in accidents (75 per cent in Lomé, 65 per cent in Ouagadougou), beyond its share in mobility. One observes also the important involvement of two wheelers in accidents in these cities.

Table 20. Registered accidents by Lomé Police Dept, Togo

Kind of accidents	Year				
	2001	2002	2003	2004	2005
Number of accidents with death	68	86	67	77	62
Number of deaths	75	88	72	92	82
Number of accidents with injury	382	425	401	468	461
Number of injuries	627	534	579	588	602
Number of accidents with light injury	793	1,045	1,014	819	812
Number of accidents with heavy injury	1,622	2,061	2,013	2,001	1,999
Number of accidents with material damage	1,872	2,012	2,200	1,580	1,365
Total registered accidents	3,115	3,568	3,682	2,944	2,700

Source: Lomé Police Department, in Guezere, 2009.

Figure 12. Typology of accidents in Lomé according to the involved transport modes (Togo)



Source: Guezere, 2009.

56. Guezere, 2009.

57. Table in Annex, Bamas, 2010.

Public transport vehicles (and particularly informal sector vehicles) are often involved in accidents, which has led to protests against their lack of safety. But their exposure to accidents is proportional to their presence in the traffic.⁵⁸

8.2. Policy responses for social aspects

8.2.1. Policy responses with respect to urban transport accessibility and affordability

The action programmes promoted by the United Nations (UN-Habitat, UNDP) and international funders in general and the World Bank in particular, have promoted national strategies for reducing poverty introduced at the beginning of the 21st century in African countries. But the urban transport component was weak or inexistent in these programmes.⁵⁹

The classical response of authorities to the affordability problem has for many years been to refuse to accept fare increases required to cover the increasing operating cost (vehicles, spare parts, fuel, etc.). But this has contributed to the decline of public transport firms.

The authorities tend to focus on the bus supply, forgetting that the urban poor have no real access to it. In some cases (e.g Antananarivo⁶⁰) the poverty-focused programmes have been abandoned and have been replaced by economic growth programme supposed to benefit all. Measures of subsidizing the transport operators in Madagascar have been designed in 2008 in order to compensate the increase of fuel prices and to keep stable fares. These measures, which have been presented as poverty-focused, have benefited the minibus (*taxibe*) users, who are from the middle class, but they have not really affected the urban poor who do not normally use the *taxibe*.

Actions for pedestrians are sometimes undertaken: the Urban Mobility Improvement Programme (PAMU) in Dakar included the improvement of footpaths in some areas and also some footbridges on the railway line, the crossing of which was forbidden and made impossible by fences. In Antananarivo similar actions facilitating pedestrians' movement were implemented but focused on the central area and were primarily enjoyed by the middle class.

8.2.2. Policy responses to urban transport safety and security

The actions aiming at a better transport safety deal with police controls on roads, technical control of vehicles, and specific actions of information, awareness campaign and training.

The real role of police for enforcement, and its effectiveness, is under debate as too much police corruption is present in the majority of FSSA countries. Security problems can sometimes come also from the police controls of the informal sector vehicles: several strikes of minibus drivers in Abidjan were induced by police controls which turned out badly with killed drivers and injured passengers.⁶¹ A traffic police unit in Ouagadougou was created in 1995 by the government of Burkina Faso, installed under the direct responsibility of the Mayor. It is considered as a very positive experience.⁶²

The technical control of vehicles is one measure used by authorities of many countries to reduce accidents (and pollution). But many vehicles, particularly from the informal transport

58. As mentioned in Chapter 4.

59. Godard, 2010.

60. Deville, 2008.

61. Kassi, 2007, p 123.

62. PDM, 2007.

Figure 13. Accident between a car and a motorcycle in Lomé, Togo



Photo: Guezere, 2008.

sector, elude this ‘obligatory’ control and much remains to do in order to achieve the goals. In Abidjan the technical visit, which is well organized by Sicta,⁶³ is not applied by all transporters. But an improvement of the rate of visits has been registered by AGETU:⁶⁴

- 24 per cent for minibus in 2004, 40 per cent in 2009;
- 10 per cent for shared taxis *woros woros* in 2004, 20 per cent in 2009; and
- 30 per cent for metered taxis in 2004, 54 per cent in 2009.

Training and information activities targeting drivers is another response. Such training programmes have been implemented with minibus and taxi drivers in Dakar by CETUD, the organizing authority. It was a component of the reform tentative of the informal transport.

Dedicated lanes for two wheelers have been attempted in a couple of cities: Ouagadougou and Cotonou. But this policy seems to have been abandoned in the last years, probably because the lanes were used by bicycles but also by motorcycles in unsafe conditions.

8.3. Challenges for future policy development

The main challenge is to promote a transport supply which can be accessible and affordable for the majority of urban dwellers. That supposes productivity efforts in the whole sector of collective transport. That involves a better organization combining the multiplicity of operators with a more important role to give to public transport on the main corridors and a better professionalization of informal transport concentrated on secondary axes and local servicing. A specific challenge is the design and the management of reduced fares dedicated to vulnerable groups.

63. See chapter 5.

64. AGETU, 2010.

The construction of roads in the newly urbanized areas is also necessary to improve the accessibility of these areas, but these roads have to be inserted in hierarchic schemes and adapted to the priority needs.

Another challenge is to recognize the importance of improving walking conditions everywhere, in central and peripheral areas. That requires dialogue with associations in districts, to train the roads technicians inside municipal services and to modify the vision of roads engineers in charge of designing the new roads investments, as they tend to ignore the importance of pedestrians impacted by these new infrastructures.

9. Urban Transport and the Environment

The environment dimension is not yet well handled in FSSA cities but some efforts are initiated in some cities the experience of which will be examined below.

9.1. Overview of urban transport impacts referred to environment sustainability

The first variable to consider for environment is the energy consumption in urban transport. The other components which are involved by fuel combustion are the emissions of local pollutants and of greenhouse gases.

9.1.1. Dependence of urban transport on non-renewable fuels

Minibuses, buses and the majority of taxis use diesel fuel. Bio-fuels have not yet been introduced at scale, although attempts have been made in some countries (Mali, Madagascar, Senegal, etc.) to introduce jatropha oil as a bio-fuel.

The energy efficiency of each mode is difficult to state as it depends on many parameters and particularly on the occupation rate of vehicle (number of passengers in average inside the vehicle) which is usually not well known. Table 21 presents data from Abidjan:

Table 21. Energy consumption and pollutant emissions by passenger in Abidjan, Côte d'Ivoire

	Individual modes (gram/trip)			Collective modes (gram/trip)		
	Private car	Metered taxi	Motorbike	Bus SOTRA	Minibus	Shared taxi
CO	84.1	40.3	240.5	3.5	8.6	26.7
HC	12.7	6.0	36.8	1.1	5.3	3.8
NOx	27.4	14.3	0.8	10.3	9.2	6.7
Lead	0.4	0.2	0.1	0.0	0.0	0.1
PM10	1.9	1.2	0.0	0.5	1.0	0.9
CO ₂	2,773	1,169	702	420	368	540
Fuel	877	371	221	133	117	171

Source: Certu, 2002

As the Table 21 indicates, the collective modes are the most energy efficient. But, contrary to what is normally thought, the minibuses are more efficient (about 10 per cent) than the buses, primarily due to a better vehicle occupancy rate. The shared taxis consumption is about 30 per cent higher than that of the buses. This reinforces the statement that one has to improve the bus occupancy rates, by concentrating them on high demand routes, in a complementarity scheme with minibuses and shared taxis operating in less demand areas.

The dependence of public transport to fuel prices is huge. Despite of the problem of data reliance and homogeneity, many surveys show a high share of fuel in operating costs, for buses and even more for informal minibuses or shared taxis (see Table 22).

Table 22. Estimates of fuel share in operating costs in selected cities (depreciation not included)

City	Taxi (%)	Minibus (%)	Bus (%)
Abidjan		40	
Conakry	64	72	81
Dakar	–	60	35
Lomé			42

Sources: SITRASS 2000 (Abidjan); Systra 2006 (Conakry); Kumar and Diou, 2010 (Dakar); Eiffia, 2010 (Lomé).

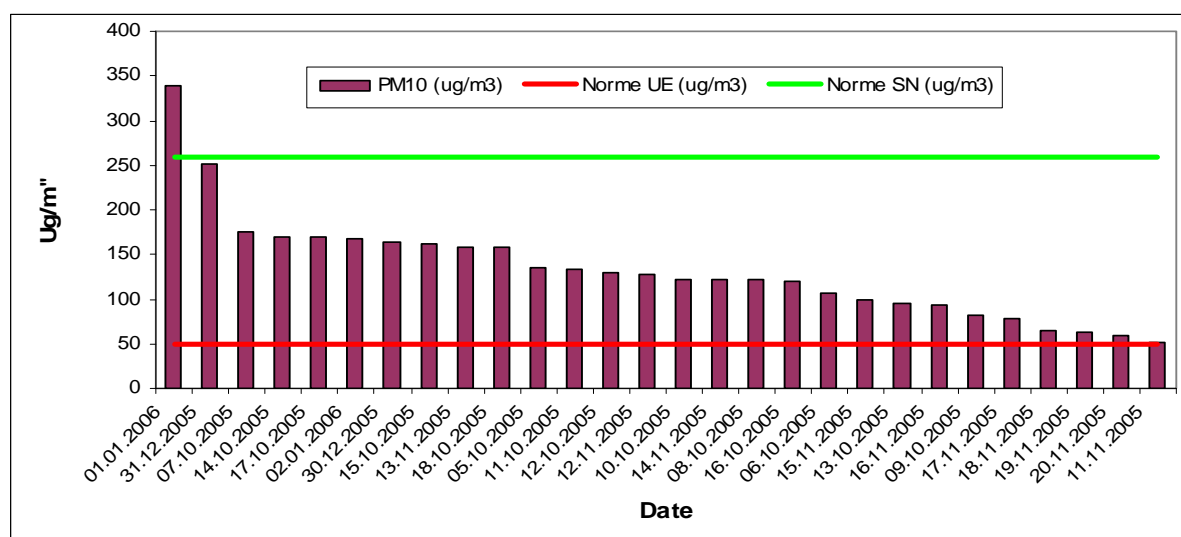
The well known political importance of fuel prices increases is illustrated by the case of Douala where the increase of fuel prices in February 2008 led to strikes and riots initiated by the taxi operators. A small increase of fuel price (3 per cent, 16 CFA francs) implied a loss of 200 CFA francs daily for the taxi operators, corresponding to a loss of 20 per cent of their daily income, as they could not increase their fares due to fear of users reactions.⁶⁵

9.1.2. Impacts on local pollution

Estimates on the emissions of pollutants in central areas of some FSSA cities are beyond the authorized thresholds defined by international standards, particularly during traffic peak hours. In Dakar, a measurement campaign of pollutants has been implemented with passive captors on a sample of 110 places of the agglomeration.⁶⁶ Figure 14 provides some selected results. The PM10 pollution is mostly below the Senegalese norm but much higher than the European Union norm.

The map in Figure 15 illustrates the concentration of pollutants in areas characterized by heavy traffic (particularly in Dakar centre), and the diffusion effect in the urban space. The

Figure 14. Distribution of PM10 concentrations in Dakar (Carnot Street) in 2005 by date (Senegal)

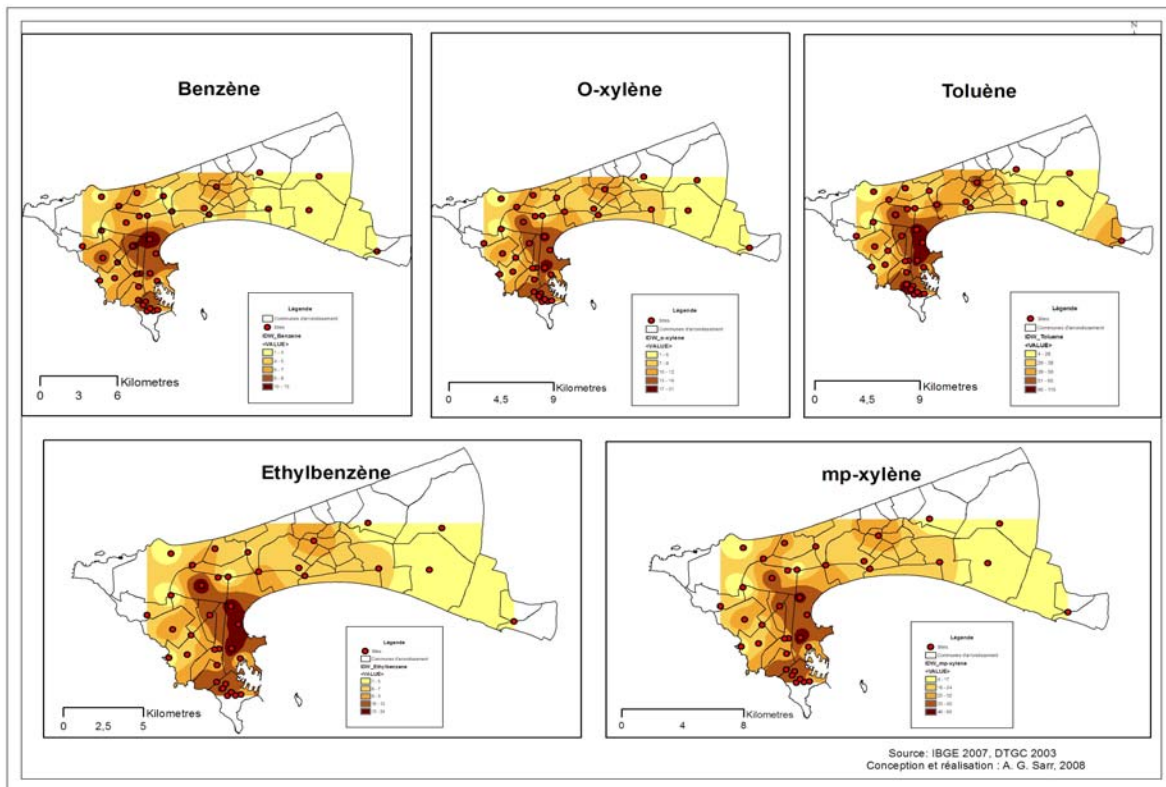


Source: Gueye et al, 2009.

65. Wiolland, Sahabana, 2009.

66. Gueye et al, 2009.

Figure 15. Dispersion of pollutants in Dakar in June 2007 (Senegal)



Source: Gueye et al, 2009.

levels of pollutant concentration are not considered as worrying for the city at large, but they are worrying in some specific locations.

The pollution problem appears most worrying in the cities dominated by motorcycles (Cotonou, Ouagadougou) which emit much CO and HC pollutants because the rate of lubricant in the gasoline is too high and the two strokes engines are not well adjusted for a good combustion.⁶⁷ In cities dominated by informal transport the concentration of diesel vehicles induces high emissions of particulates (PM10) and nitrogen oxides (No_x).

Yet, the cost of pollution impacts on health seems to have been overestimated in the past by comparison of safety costs in some studies supported by the World Bank, for instance in Dakar where its cost was announced to represent 2.7 per cent of Senegalese gross domestic product (GDP) on a very discussable calculation basis.⁶⁸

9.1.3. Impacts on climate change

The level of carbon emissions (greenhouse gases) is very low in FSSA cities by international comparison but caution needs to be kept because the trends (increase of motorized mobility) could induce high increase in those emissions if no policy deals with. Estimates indicate that the CO₂ emissions of Dakar and Abidjan in 1998 were as follows:⁶⁹

- 400,000 tonnes per year in Dakar.
- 950,000 tonnes per year in Abidjan.

67. Godard, 2002b.

68. Data were drawn from the situation in Jakarta (Indonesia) and transferred without caution to the population of Dakar although the economic context (income level) was different and the pollution impact less important (Godard, 2002b).

69. Godard, 2002b.

In Abidjan the urban ‘disfunction’ costs⁷⁰ were also appraised with margin of data: that gives an idea of the comparative importance of each main external costs induced by the urban mobility (see Table 23).

Table 23. Disfunction indirect yearly costs of urban transport in Abidjan (Côte d’Ivoire) in 1998

	Damages cost (billions CFA francs)	Weight in total costs (%)
Local pollution	34–61	34
Greenhouse gases	4–8	4
Noise	2–3	2
Sub total environment costs	40–72	40
Congestion	23–35	21
Internal ‘disfunctioning’ public transport	17–28	16
Sub-total network ‘disfunctioning’	40–63	37
Accidents	27–37	23
Total	107–172	100

Source: Duprez, 2002.

9.2. Environment policy responses

The knowledge of pollution and its consequences is weak but it is increasing thanks to measurement tools installed progressively in large cities (Dakar example). The first step of action is to equip progressively in measurement tools and analysis disposals.

Concerning the vehicles emissions, efforts are made to implement the technical control which is obligatory in many countries. One of the controlled elements is the emission of key pollutants. But the efficiency of these controls is doubtful as many obstacles have to be overcome, including corruption.⁷¹

Another response is of course a reorientation of public transport towards the most environmentally efficient: buses more than minibuses, new less polluting vehicles replacing old vehicles, higher capacity minibuses replacing the small ones. Nevertheless the trend does not seem to be very in favour of environmentally friendly buses in FSSA cities: second hand buses and cheap new buses do not satisfy the high norms of pollution.

The ideas of new rail or tramway projects are present in many cities (Bamako, Cotonou, Ouagadougou, etc.) but serious feasibility studies are few and no project has been yet launched.

9.2.1. Existing policy responses with respect to private motorized urban transport

The main response brought by the authorities has been to limit second hand imports by excluding too old vehicles in some countries. Some attempts have also been made to introduce parking fees in central areas at the initiative of municipalities (Cotonou, Dakar, etc.).

70. The original source uses the French term *dysfonctionnement*. That covers both the external costs (pollution, accidents, noise) and the internal costs coming from bad operating performances (congestion involving losses of time).

71. Sicta, 2010.

Inside the traffic rationalization approach a very interesting initiative has to be noticed in Bamako:⁷² the introduction of the one way scheme on one of the two bridges (Pont des Martyrs) on the Niger River, reversible according to the time period. The two bridges are the only traffic axes linking north and south sides of the river on which the city is situated (historic city in the north but expanding urbanization mainly in the south). The new scheme of traffic management on the second bridge was introduced in 2000. It consists of the one way scheme from south to north where are the working places during the morning peak period 7am-9am, and the opposite during the afternoon (3.30pm-5pm) with the one way scheme from north to south. This has given a supplementary capacity that technicians consider as equivalent to a third bridge. But increasing motorization and traffic has led to the construction of a third bridge (inaugurated in 2010) in Bamako, while plans are under-way for a future fourth bridge.

On the other hand, non-motorized transport is not yet promoted by policy makers. Pedestrians benefit from some facilities, while bicycles are not favoured at all, primarily because of cultural obstacles).

There are not yet specific responses directly identified to adapt the mobility system to the impacts of climate change.

9.3. Challenges for future policy development

The main challenge is to design environment friendly transport solutions which are affordable for the community and the cost of which does not exclude the urban poor from having access to collective transport, public or informal. More specific challenges are:

- A progressive renewal of vehicles fleets to ensure better conformity with environmental norms, which also implies more effective controls.
- Introducing programmes to replace two strokes engines with four strokes engines in two wheelers based in cities, in order to limit the pollution produced by two wheelers.
- A better traffic management to limit traffic congestion, which is increasing with increasing numbers of private cars and informal transport vehicles.
- Reinforcing the mass transport services on the main axes of urban agglomerations by introducing them priority measures.
- Making the population, the transport operators (and particularly the drivers) and the authorities more aware of the environmental impacts of the urban transport sector.
- Developing the introduction of measurement tools to obtain a better knowledge on the real pollution levels registered in various areas of the cities.
- Managing, through a permanent dialogue, the difficult matter of fuel prices.

72. PDM, 2007.

10. The Economics of Sustainable Urban Transport

This chapter examines the attempts to get a better economic and financial profile of transport operators, by focusing on the innovative Dakar experience of minibus fleet renewal.

10.1. Overview of urban transport factors referred to economic sustainability

The public transport productivity is related to its costs and therefore the applied fares. That is why it is important to consider the factors of this productivity and to aim at sustainable solutions. The key factors of this economic sustainability are:

- energy cost;
- bus acquisition and maintenance costs (spare parts are often a key factor); and
- employees productivity.

However, traffic congestion has to be considered as well, as an important factor which reduces this productivity. The shortage of asphalted roads and failing road maintenance mechanisms in peripheral areas are other reasons of low productivity for buses. The bad state of roads limits the access of public transport vehicles: i.e. buses cannot easily access many areas, and leave the market to minibuses or even more so to shared taxis and motorcycle taxis.

Also the bad management of these roads (and of crossings) limits their traffic capacity, which leads to additional costs for the community.

Accidents are another important costs for the community, which have to be considered when decisions are taken to prioritize the public expenses. Data from Abidjan⁷³ reveal that the general cost of accidents was 27–37 billions CFA francs (around US 65 million) in 1998. That corresponds to the equivalent production of 32,000 workers during one year. Another estimate on the case of motorcycle taxis accidents in Lomé⁷⁴ indicates that the annual cost of such accidents was to 137 million CFA francs (around US\$0.3 million) in 2002.

Another important economic and social dimension is the employment offered by informal transport which contributes to the social integration in a context of structural unemployment (see Table 24). One vehicle may involve one direct employment (motorcycle taxi driver) or four employments (minibus: two teams of one driver and one controller).

Table 24. Estimates of informal employment in some African cities

	Abidjan 1998	Conakry 2004	Cotonou 2000	Dakar 2000	Douala 2004
Motorcycle taxis fleet	–	–	60,000	–	22,000
Taxis fleet	13,200	5,000–6,000	N/A	12,000	6,000–7,000
Minibus fleet	2,700	1,200–1,500	N/A	4,000	300–400
Direct employments	37,000	20,000	60,000	28,000	43,000

Source: Godard, 2011.

73. Duprez 2002.

74. Guezere, 2009.

10.2. Evidence of policy responses

10.2.1. Existing policy responses to public transport

One main response is the attempt to create or to consolidate a new bus company. SOTRAL in Lomé exemplifies the difficulties involved. SOCATUR in Douala is an example of a new agreement between the private operator and the municipality in order to make possible its extension.⁷⁵

In Lomé (1.7 million inhabitants in 2011⁷⁶) SOTRAL was created at the initiative of the municipality after many years of negotiations and a trial and error approach, thanks to a second hand bus donation from Lyon (France) inside a decentralized cooperation.⁷⁷ The project started in 2002, but SOTRAL was really created in 2007 and the operation of buses started in September 2008 with 10 buses operated on a first line. A feasibility study was made in 2009–2010 aiming at the extension of the network: the potential customer base was estimated as sufficient but SOTRAL would need investments (a new depot, a central station for interchanges).

The experience revealed the discrepancy between the production costs (despite of the ‘gratuity’ of buses and spare parts for the bus company) and the income from the fares. The institutional weakness of the municipality created problems, and it was necessary to clarify the status of the company and its contract with the authorities.

Another possible response deals with the facilities given to buses in traffic. During the 1980s there had been a dedicated bus lane in Abidjan, but difficulties of enforcement led to failure. A similar failure was observed in Dakar in the 1990s with badly designed bus lanes.

A BRT (bus rapid transit) scheme is now examined in Dakar. Initial studies were made in 2003 but CETUD was reluctant to be engaged in this kind of project. The project was reviewed again in the new urban mobility programme negotiated with the World Bank in 2010.

Some decision makers are more attracted by new modern transport technologies in considering the feasibility of tramway projects. In Bamako for example, there is proposed tramway project which is strongly supported by the President of Mali, and benefits from the help of a decentralized cooperation with the French City of Strasbourg⁷⁸ which has financed the feasibility study. The project would be implemented by Translohr, a firm who develops a technology of tramway on tires. Two lines are proposed, the first line would be North–South and would have to cross Niger River on the bridge ‘Pont des Martyrs’. But financing is not yet finalized to cover the investment costs of around €300 million.

Tramway project plans are present in several cities: such a project was launched in 2004 in Antananarivo thanks to a gift from Zurich (Switzerland) but it has not been finalized. The idea had also been considered by the Mayor of Dakar some years ago, but another project has been presented in 2005 by the President of Senegal consisting of a ‘tramway/train’ between Dakar and Thies. The Mayor of Ouagadougou⁷⁹ has also called for modernization of his city. But the challenge is huge in these cities as their authorities already experience difficulties in providing sustainable bus services.

75. See also chapter 11.

76. United Nations, 2010.

77. See also Chapter 3.

78. Hertzog, 2010.

79. Simon Campaoré, intervention in the Round Table of Authorities at UATP conference, Dakar, October 2010.

10.2.2. Existing policy responses to informal motorized transport

The responses of the authorities in FSSA cities tend to correspond to the following sequence:

- negation or underestimation of this phenomenon;
- fighting this mode of transport, which is not authorized nor organized by the public authorities;
- tolerating this mode which meets an important part of travel needs in the city;
- attempting to organize its operation, to improve the adapted road infrastructure, to improve the vehicles; and
- in parallel, introducing mass transport systems to limit the expansion of informal transport. But the competition is not easy for formal public transport, thus the question of 'elimination' of informal transport is sometimes again advocated.

The main lesson is that public authorities have been late to consider the importance of informal transport (many international experts are probably also responsible for this negligence) and to engage actions to increase its efficiency in contributing to urban travel needs, while at the same time limiting the negative impacts of informal transport.

10.2.3. Dakar experience: the minibus fleet renewal programme

The willingness of public authorities to formalize informal minibus activities is well illustrated by the Dakar experience.⁸⁰ It consists of a fleet renewal programme, funded by the World Bank and managed by CETUD, the organizing authority. Various measures are inserted in this programme:

- Required grouping of operators in economic interest groups, collectively responsible for loan repayment: 14 economic interest groups were created, 9 were involved in the renewal programme (245 operators in total).
- Creation of specialized financial structures: AFTU (Urban Transport Financing Group, *Agence de Financement des Transports Urbains*, Dakar); FGM (Mutual Guarantee Fund, *Fonds de Garantie Mutuelle*, Dakar); Mec-Trans (*Mutuelle d'Epargne et de Crédit des Transporteurs de la Région de Dakar*, a transport operators micro-credit organization).
- Scrapping of old vehicles, to be replaced with new ones.
- Concession agreement given to economic interest groups on 18 routes defined by CETUD.
- Personal contribution of 25 per cent of the vehicle price by the operator (leasing scheme).
- Introduction of tickets paid by users, replacing the previous cash payment to controllers.
- Remuneration of drivers and controllers on the basis of wages, replacing the previous scheme where they paid themselves directly from the fare receipts.

A fleet of 505 Tata vehicles has been produced (assembled) by the new Senbus industrial firm located in Thies after a specification process and an international call for tender. The new minibuses (unit price of 22 million CFA francs, i.e. US\$50,000) have been delivered in three tranches from December 2005 to mid-2008.

80. Kumar and Diou 2010.

Figure 16. A new Tata minibus in Dakar (Senegal)



Photo: Godard 2010.

A second phase was launched in 2010 with a revolving financial scheme involving Chinese minibuses (also built by Senbus in Thies).

The evaluation of the programme made by the World Bank states positive results:

- very good rate of reimbursement with only few delays;
- faster and more reliable service offered to users because of the rationalization of vehicles movements on routes;
- fixed fares for users who escape from the previous uncertainty;
- improved profitability for the owners.

These positive results arise more from the better organization of operations than from the introduction of new vehicles itself. The financial sustainability of this programme seems good, but it should be noted that there are hidden subsidies, such as:

- The compensation payment (around US\$5000) for the old discarded vehicles represents much more than their real value.
- Concessional financing (rate of 6 per cent by the International Development Association (IDA) to FDTU, rate of 8 per cent of FDTU to economic interest groups).
- Administration cost of the programme funded by the World Bank.

Other considerations have to be made on the limits of the experience:⁸¹

- A first lesson of this positive experience is that it needed a long time of negotiations and adjustments between the funder (the World Bank), the Senegalese authorities, and the minibus operators. The first announcement of such a project was made in 1992, the programme was launched thanks to the CETUD creation in 1997⁸² for an implementation only in 2007–2008.

81. Author point of view.

82. See Chapter 11.

- Another apparently successful negotiation has been held between the owners' unions and drivers' unions in introducing the formalization of drivers revenues through wages: the previous system (still applied to other minibuses *cars rapides*) was based on the implicit rule where drivers keep the part of receipt beyond the amount they have to give the owner. This is a major innovation in the context of informal transport, the application of which has nevertheless to be checked in detail.
- This successful programme concerns 505 vehicles i.e. less than 20 per cent of the fleet in operation in Dakar (around 2000 to 3000 minibuses).
- If this programme has to be extended (what seems very necessary for consistency reasons) it will have to cope with additional obstacles to meet a financial sustainability.
- The best and profitable routes have been assigned to the vehicles of the first phase. Other routes are likely to produce less revenue by vehicle.
- The owners' risks expressed by their personal contribution (5.5 million CFA francs) have been limited through the loans made by Mec-Trans which got itself a loan from a State bank: the risks were thus transferred to the Senegalese State.
- The suppression of hidden subsidies will limit the profitability of the vehicles owners.
- There are some trends of increasing costs (the Senbus vehicle price would increase to around 28 million CFA francs instead of 22 million CFA francs in the first phase; gasoline prices are increasing), which will be not easily covered by fare increases.

10.2.4. Other policy experiences addressing informal transport

Another more limited example is from Nouakchott⁸³ where the public authorities decided to normalise the taxi industry and to enforce the regulations introduced in 2008 after a dialogue process and an information campaign, through which the registration of vehicles was made obligatory in July 2010. In order to obtain a licence, each vehicle had to be painted in yellow with a blue line to be easily identified. The aim was to avoid the presence of clandestine transport providers, particularly for safety and quality of service reasons. But the implementation was already failing in October 2010, as only less than 30 vehicles were actually registered.

10.2.5. Existing policy responses with respect to commercial goods transport

There are attempts to organize trucks movements in many FSSA cities: either schedules of authorized activities, or dedicated roads and exclusion from other roads, particularly in central areas. Policy responses to manage the trucks movements in urban areas are usually:

- Trucks circulation time restrictions;
- Trucks circulation areas restrictions; and/or
- Trucks parking measures.

The main restrictions introduced in many cities are time restrictions (decided by the State) obliging trucks to operate during the night (before 5am): such restrictions were observed in Bamako, Cotonou, Lomé, and Ouagadougou.⁸⁴

There are also some traffic restrictions for trucks in some areas, streets or axes. For example in Ouagadougou, articulated trucks are forbidden inside the city so that they are

83. Lam, 2010.

84. Bamas, 2002a; Seddoh 2002; Yeou 2002.

obliged to make transfer of goods in specialized logistic centres along the peripheral boulevard.

In some cases traffic plans are elaborated for trucks movement (access and exit from the port) with some dedicated infrastructures (roads, bridges) but their implementation has been constrained by budget limitations (examples of Abidjan, Conakry).

In Cotonou, the policy has been to build around year 2000 two parks dedicated to trucks near to activity areas: one trade centre and the international market Dantokpa. Parking spaces are built by the State and transferred then to the City which has contracted a private firm to manage it through a concession contract. The receipt for the city was 21 million CFA francs in 2002.

There is a trend to forbid or to limit non-motorized transport of goods in the central areas as they contribute to traffic congestion (example of Dakar where animal drawn carts are forbidden in the central area) but the limits are not always clear and the enforcement is not easy.

10.2.6. Policy responses for financing urban transport

There are no recent responses on the matter of financing urban transport in FSSA cities: receipts from users (fares) are completed by financial compensations through reduced fares for some categories of passengers (students, civil servants, etc.) and more rarely by subsidies from the State. Some innovative experiences have to be noticed: in Abidjan, SOTRA was successful in 2007 in introducing bonds on the financial market (UEMOA region) in order to finance its investments.⁸⁵ SOTRA has also separated its industrial (assembling and heavy maintenance of buses) and training activities in two other distinct firms.

The main and sometimes single source of financing remains the fares, which the operators want periodically to increase. But this approach may be not efficient, as the elasticity of patronage to fares can be high (and negative of course), which tends to cancel out the expected advantages, as illustrated by the recent experiences in Ouagadougou and Lomé.

In Ouagadougou bus ticket fares were first fixed by the newly created SOTRACO in 2003 at 200 CFA francs.⁸⁶ But the low level of patronage obliged SOTRACO to reduce the fare drastically to 100 CFA francs in January 2004. In order to solve the problem of structural deficit, it was then decided to increase the fare to 150 CFA francs in January 2006. This however, led to a passenger decline of 41 per cent, eliminating the expected improvement of the financial situation.

The same dilemma was experienced by the previous SOTRAO in 1997 when it decided (in agreement with public authorities) to increase the ticket fare from 100 CFA francs to 150 CFA francs. The result was a 40 per cent decrease in the number of passengers.

In Lomé SOTRAL increased fares in 2009. The elasticity of passengers to fares, was estimated to -3.4. That means a 10 percent increase of fare results in a 34 percent decrease of passengers. That is why SOTRAL was finally obliged to diminish the fares to get again more passengers.⁸⁷

85. Trans Africa Consortium, 2008.

86. Tindano, 2008, pp127–129.

87. Effia, 2010.

10.3. Challenges for future policy development

In every large FSSA city, public authorities express a desire to launch or to develop public transport companies, but they are faced to difficulties to find sustainable solutions. Besides the funding constraint, there are:

- The need to get skilled employees and management staff.
- The unfair competition from the informal transport, if it is not well regulated and enforced.
- Conflicts with unions when a company was operating for a long period (example of Dakar, with SOTRAC then *Dakar Dem Dik*).
- Specific difficulties to obtain buses that are adapted to the climatic conditions (heat, humidity) and to the roads state (potholes, etc.).
- Need to clarify a contract between the relevant public authority and a potential company. This takes much time and needs a service inside the municipality and/or the State to manage the negotiations.

The fares policy is usually defined by public authorities, which try to maintain affordable low fares to make public transport accessible to the majority of people. But this policy impedes the development of transport supply. The need of operators to cover their operating costs (including the amortization of vehicles) has led many public authorities to accept high increases of fares.

The real constraint on fares is the level of resources the potential passengers can allocate to public transport. The sensibility of reactions to high fare increases should encourage the authorities to implement more frequent but low increases in fares. There is also a need to reform and modernize the fares collected in introducing passes. However, this may not be socially sustainable, as the poorest have no means to pay such fares in advance, and would thus be excluded from such measures.

Accessibility to employment is another major challenge for the cities. The bad of public transport is a major obstacle to access a job. Actually transport failures may disturb the working schedules respect, inducing also the absenteeism of employees. That is why some specialized transport services are organized by employers.

Second hand vehicles imports have been a factor of expanding the informal transport fleets and to decrease their operating costs. This has concerned also the bus companies which have been equipped by imported old buses, before a new generation of cheap buses are introduced by manufacturers from India or from China.

Fuel expenses are a major cost element in the operating costs: one observes a high level of fuel prices in the majority of FSSA countries, coming from their taxation policy, at the exception of Madagascar and Benin: in Benin because of the proximity of Nigeria from where cheap fuel is being smuggled. The pressure of fuel costs on the operators constitutes a permanent challenge for the future.

11. Urban Transport Institutions and Governance

This chapter is focused mainly on the innovative experiences of urban transport organizing authorities implemented in Dakar and in Abidjan.

11.1. Overview of urban transport impacts referred to institutional dimension of sustainability

Poor coordination between the numerous institutions involved in urban transport lead to problems in developing unified and integrated urban transport policies. Many ministries are involved through actions which sometimes prove to be contradictory. The main ministries are:

- Ministry of transport (for regulation and management of the sector, delivering the licenses, supervising the public transport firms).
- Ministry of finance (for allocating resources and financing investment projects, subsidizing the public transport, or controlling fares, negotiation with international funders).
- Ministry of trade (for vehicle import regulation and taxation).
- Ministry of environment (which, in Benin is more involved on urban transport than the Ministry of transport).
- Ministry of the interior (for police control).
- Ministry of international cooperation (for negotiating international support to urban transport projects, loans or gifts).
- Prime Minister and State President, who are sometimes very involved in projects.

Another observation deals with the insufficiency of the decentralization process in the field of urban transport which stays very controlled by the states and not enough by local authorities.⁸⁸ In countries like Senegal or Burkina Faso, urban transport is not included in the sectors concerned by the decentralization process.

11.2. Overview of policy responses on institutions and governance

In this institutional context the creation of transport authorities has been the main response, with an effective implementation in Abidjan and Dakar, the experiences of which are presented below.

11.2.1. AGETU experience in Abidjan

In Abidjan, AGETU was created in 2000 as a State Society.⁸⁹ The board is composed of:

- 7 members representing the State, including 3 from the local authorities (districts).
- 5 members representing the private sector, including 2 from informal transport.

The main missions given to AGETU are:

- definition of urban transport networks;
- delivery the licences to the operators;
- approval of public transport fares;

88. PDM, 2007.

89. AGETU, 2010.

- managing calls for tender for new urban transport services;
- programming of new investments; and
- monitoring the application of concession to the bus company SOTRA.

A main task given to AGETU is to manage the minibuses and shared taxi licences and receipts. But from the outset, there has been a conflict with municipalities (districts) of which metro Abidjan is composed, which were reluctant to transfer the funds obtained from the fees and taxes levied on shared taxis illustrated by Table 26. The opposition of the districts comes also from the critic that AGETU is State controlled, in contradiction with the decentralization process. This conflict is not yet solved, partly due to the political crisis in the country.

The AGETU budget for the year 2009 expected resources of 1,187 million CFA francs (see Table 25) but the registered receipts (subsidies not included) were only 759 million CFA francs due to the high share of invalid licenses indicated in Table 27.

Table 25. AGETU budget for year 2009, Abidjan, Côte d'Ivoire

	Provisional budget (million CFA francs)	Implementation (million CFA francs)	% implementation
Registration tax	145	278	191
License tax	975	415	42
Concession duty	60	64	107
Administrative receipts	0	0.9	0
Sub-total	1,187	759	64
Subsidy	179	441	246
Total resources	1,366	1,201	88

Source: AGETU, 2010

Table 26. Evolution of AGETU resources, Abidjan, Côte d'Ivoire

Year	AGETU receipts (millions CFA francs)	Districts receipts from license taxes (millions CFA francs)
2001	55	–
2002	100	–
2003	59	–
2004	65	–
2005	1,184	632
2006	1,238	471
2007	1,218	95
2008	1,044	488
2009	759	584

Source: AGETU, 2010

Table 27. Number of registered vehicles by AGETU, Abidjan, Côte d'Ivoire

	Minibus gbakas	Shared taxis (intra-district)	Shared taxis (5–9 seats)	Metered taxis	Other	total
Owners	2,924	3,878	192	6,757	257	14,008
Registered vehicles	5,584	5,617	241	17,355	457	29,254
<i>Valid licenses</i>	<i>3,171</i>	<i>29</i>	<i>61</i>	<i>8,806</i>	<i>252</i>	<i>1, 319</i>
<i>Not valid licenses</i>	<i>2,413</i>	<i>5,588</i>	<i>180</i>	<i>8,549</i>	<i>205</i>	<i>16,935</i>
Rate of valid licenses (per cent)	57%	0%	33%	51%	55%	42%

Note: The owners are incited to be registered because it is a condition to satisfy the technical control by Sicta.

Source: AGETU, 2010

In 2009 there were about 3000 inter-district shared taxis in operation. These taxis are illegal as the shared taxis *woros woros* are only allowed only for internal routes inside each District. These shared taxis pay the following taxes and fees:

- 30,000 to 65,000 CFA francs to the unions managing terminals;
- 28,000 CFA francs to the Districts where are located the route terminals (parking tax); and
- 67,500 CFA francs to the Abidjan District (cross over tax).

In order to solve the conflict, a new agreement was reached in 2009 with the following formula for sharing the licence receipts managed by AGETU:

- 38 per cent for AGETU;
- 52 per cent for local authorities (districts); and
- 10 per cent for DGI (*Direction Générale des Impôts*, Ministry of Finance).

But the opposition of the districts remained, thereby drastically limiting the AGETU resources. As a result, AGETU was forced to limit its activity: the urban mobility plan has (again) been postponed; and a monitoring of SOTRA services through surveys was not implemented.

Potentially AGETU would also have to manage the supervision of the bus company SOTRA, but it does not seem yet to have the political power to do it.

The projects announced by AGETU in 2010 deal with:

- renewal of the fleet : 3000 minibuses and 25,000 urban taxis potentially involved; and
- implementation of the urban train project, which has been frozen since 2002 because the political instability.⁹⁰

A first step of the fleet renewal programme was launched in 2009 with the creation of an economic interest group named Djiguissou involving 5000 taxis and 2000 minibuses, the provision of which is negotiated with a Chinese company. A funding structure has been created to support the fleet renewal: FDTR (Road Transport Development Fund) which is financed by 10 per cent of the yearly special tax on matriculated vehicles (*vignette*). The expected annual resources from this are estimated at 1.2 billion CFA francs.

90. Unfortunately this political instability has been again very activated at the occasion of the elections for the new President in December 2010, turning into a civil war.

11.2.2. CETUD experience in Dakar

The main part of the institutional reform in Dakar was the creation of CETUD (Executive Council of Urban Transport in Dakar) in 1997 after many years of discussion under a surprising status of a public organization of a professional nature. It fundamentally aims at:

- resolving the problem of dispersion of jurisdiction between the various central and local institutions concerned by urban transport in Dakar; and
- organizing a better coordination for definition and decisions on urban transport policy, with the vital participation of the local authorities.

According to the President of CETUD, CETUD carries out the following responsibilities, on behalf of the State, the local authorities of the Dakar region, and the professionals of the sector:⁹¹

- Decide which routes to be served, the corresponding authorization quotas for public transport, and their technical operating terms.
- Prepare ‘call for tender’ documents, sign agreements with the registered transporters, and control implementation of contracts.
- Propose tariff policies to the appropriate authorities.
- Identify the constraints of the public service and determine the relative financial compensation.
- Develop criteria for admission to the profession of public transporters.
- Implement studies and initiatives for training, information, and promotion for urban public transport.
- Coordinate between the different types of public transport; and in particular, arbitrate the division of profits in the case of tariff integration.
- Develop and support the creation of shares and investment programs to improve infrastructure, traffic, and road safety services.
- Improve the condition and quality of the transport fleet to contribute to the fight against pollution generated by motorized transport.

The status of CETUD is different of AGETU because it does not manage the licences which are the responsibility of various institutions according the kind of transport mode:

- the local authorities (communes) for the shared taxis (called *taxis de banlieue*, previously *taxis clandos*);
- the Dakar Region Governor for individual taxis;
- the Ministry of Transport for minibuses; and
- the Ministry of Transport and the Ministry of Finance for the bus company with which the agreement has to be signed through CETUD.

CETUD has in fact no formal power to manage the public transport system, but acts by delegation from the ministries of Transport and Finance. It signed the concession agreements with minibus operators (economic interest group), but it has no enforcement power to apply the monopoly given to operators.⁹²

CETUD has been supported by funds from World Bank urban transport projects. In parallel to CETUD a financial structure has been created aiming to finance CETUD current

91. Thiam, 2003.

92. Kumar and Diou 2010.

budget and actions in the sector: FDTU (*Fonds de Développement des Transports urbains*) enjoys a yearly contribution of 400 million CFA francs from the State. The statutory contributions of other parts (operators, local authorities, etc.) have, however, never been paid because they claim that they have no resources for this.

But CETUD competence is also limited by the initiatives of the President of Senegal who wanted to suppress it in 2000 and then has pushed in parallel many projects in urban mobility (creation of the bus company *Dakar Dem Dik*, tramway project between Dakar and Thies, relocation of the rail central station outside the centre, etc.) without dialogue with CETUD.

11.2.3. Other institutional responses

In Ouagadougou the same preliminary steps have been launched towards an urban transport authority: first a seminar in 1993; creation of a committee; decisional seminar in 1997. But the creation was frozen until 2002 when a secretary was nominated to finalise the project of CETUO (*Conseil Exécutif des Transports Urbains de Ouagadougou*). But opposition from the Ministry of Finance stopped the project. The transfer of power was not accepted, neither the operational cost of such a new structure. Nevertheless, autonomous financial sources had been identified, for example fees on parking receipts because there are numerous paid parks informally managed, especially for two wheelers.

In Douala, the difficulties experimented by SOCATUR to supply a sustainable bus service have led the authorities to create a partnership between the bus company and the Urban Community of Douala (*Communauté Urbaine de Douala*, CUD) in the framework of the Government instructions in favour of public-private partnership promotion. An agreement was signed in December 2007:

- the previous private investor keep 67 per cent of capital;
- CUD takes 15 per cent of capital;
- the districts of Douala share the remaining 18 per cent of capital; and
- the Board is chaired by CUD.

This agreement aims at giving more financial resources to SOCATUR and possibly fiscal reductions. The project consists mainly of getting a new fleet of 520 buses and a rehabilitation of equipments. The fare is expected to be reduced to 150 CFA francs thanks to a better productivity. 1500 new jobs would be created through this new scheme.

In Bamako, BRCTU (*Bureau de Régulation de la Circulation et des Transports Urbains*) is a decentralized administrative unit under the responsibility of the District of Bamako.⁹³ It has in charge the preparation and the implementation of traffic plans, and also the relationships with the public transport operators, mainly the minibuses operators grouped in unions, but also the bus companies. BCRTU provides licences to the operators and receives the taxes from these operators (operating tax and parking tax).

11.3. Challenges for future policy development

The institutional factors observed in the FSSA cities include the lack of means (financial, human) at disposal of cities, a poor co-ordination between concerned government bodies, insufficient transparency, and insufficient political will to cope with the difficulties.

93. PDM, 2007.

One important aspect is the relationships between the State and the municipalities: decentralization is not yet very developed, with various degrees according to the countries. That fact is a heavy constraint for a better governance of urban transport. But the solution is not a rapid transfer of responsibilities unless local authorities have sufficient resources to manage urban transport. Thus, this reform has to be implemented progressively.

The creation of organizing (or regulating) authorities remains the main challenge for the future in the majority of FSSA cities. There is no unique scheme for such authorities. Each country has to find its own scheme depending on a multitude of local factors. Probably one needs also to distinguish the case of the capital city where strategic and political security dimensions are present and the case of 'secondary' cities where the institutional framework may be easier to handle.

12. Towards Sustainable Urban Transport

12.1. Non-motorized urban transport

Walking is absolutely essential in the mobility patterns of FSSA cities, yet the conditions of pedestrians are not well addressed. The risk is that they continue not to be a priority although relatively inexpensive measures can improve their conditions. Progress could be obtained through decentralized actions which suppose a set of actions: dialogue with concerned populations, reinforcement of technical services in local authorities, and even a decentralized management at the level of districts or sub-districts; awareness campaigns and training of road engineers.

Bicycles are not much used in FSSA cities, with the exception of some Sahelian cities (particularly Ouagadougou). Nevertheless some attempts are made to favour their use, first for a leisure purpose. It is necessary to continue actions to enable its possible use in the future when the image of this mode will be more positive: i.e through promotion, safe bicycle routes, parking facilities, etc.

12.1.1. Public urban transport

The public transport sector has been in a crisis for two decades. Its role has become very low in almost every city. One lesson from the experiences of the new bus companies created in the 2000s is that in the present context, the private bus companies cannot be operated without subsidies or financial compensations as they are subjected to various constraints of public service, the cost of which is not covered by the fare receipts.

But the key to success will be to improve the productivity. The implementation of dedicated bus lanes, and other measures improving the commercial speed, could be a solution to decrease operating costs, which would then reduce the need of subsidies. The BRT scheme imported from Latin America does not work well because it has to be adapted to the context of FSSA cities. Nevertheless it seems necessary to introduce priority measures for buses on the main road axes. That supposes the reinforcement of technical services inside local authorities.

12.1.2. Informal motorized urban transport

Despite its negative externalities, the informal transport will continue to play a major role in meeting the travel needs in FSSA cities. This role will be progressively reduced if the public transport supply increase. The policy is not to fight the informal transport aiming at eliminating it, but rather to professionalize the operators and to make them entering into a larger organization based on a complementarity scheme with public transport.

The Dakar experience gives useful lessons. Many minibus operators have entered into an organizational scheme proposed by the organizing authority (CETUD) with positive results where each part is winning. But the negotiation process needed much time.

Other cities are planning similar experiences of minibus fleet renewal with financial facilities negotiated in a scheme of grouping the operators for services defined at minimum by the public authority.

But this experience reveals also limitations: the most profitable segments (routes) have been covered by the reform but one needs to extend it to the whole set of minibuses in the agglomeration. There will probably be a need to design a kind of compensation between more and less profitable routes, obliging the public authority to be more active.

Controls and enforcement are the counterpart of any policy addressing informal transport. The practice is insufficient everywhere and is disturbed by a generalized corruption in many cases. This challenge will have to be tackled but it also depends on societal factors outside the transport sector. Police training and the creation of specialized police units have to be considered among other possible action.

12.1.3. Private motorized urban transport

The relative number of cars in FSSA cities is low, for economic reasons, thus car fleets are expected to increase with future increases in incomes. This trend could be slowed down only by significant improvements of collective transport supply.

The cities will have to introduce more and more traffic management measures (parking management included) to cope with traffic congestion, and to give collective transport vehicles the priority in roads use.

Increased urbanization combined with increases in car use forces cities to implement large investments in roads in the new peripheral areas but also sometimes in central areas which were underequipped. Their design has to take into account much more the multiplicity of modes sharing these roads: various collective modes, two wheelers, trucks, etc. Special attention has to be given to pedestrians impacted by large infrastructures. It is not right to consider only footbridges to permit them to cross, there are solutions to better integrate such roads in then urban environment. It is also highly recommended to avoid too high capacity roads in urban areas (2x4 ways or more) which have major negative impacts (social and other) on the areas they pass through.

12.1.4. Commercial goods transport

The efficient organization of goods transport movement within the urban areas is very important from an economic point of view, both for international trade (cities with a port activity particularly) or for the internal consumption (food on markets particularly). Nevertheless, it is frequently neglected in the urban transport policies and not well integrated in the urban transport planning.

The first recommendation is to improve the knowledge on urban logistics. The second one is to better integrate this dimension in urban mobility approaches and in traffic management, which requires adapted coordination structures.

12.1.5. Environmental sustainability of urban transport

The environmental impacts of motorized transport remain limited by their low share in trips. They are nevertheless worrying in dense areas and the trend is the increase of pollutants emissions, which justifies strong actions to avoid further deterioration.

Traffic management interventions are necessary to limit the congestion and the concentration of pollutants. The development of collective transport is another answer, which has to be reinforced by this environmental dimension. But, simultaneously actions on vehicles and engines are necessary in order to eliminate the most polluting ones, under the social constraint of operators' incomes.

A special attention should be given to motorcycles (for private use or as taxis) which involve accident risks and pollution in the present practices. The solution does not seem to be to try to eliminate them, but rather to train the drivers and to achieve better enforcement of traffic and other rules. It will be necessary progressively to introduce less polluting

motorbikes (but the introduction of electric motorbikes is out of scope, due to recurrent problems with the electricity supply, probably for many years to come).

Monitoring actions of pollutants concentration which have been initiated in some cities have to be reinforced and widened to all large cities.

12.1.6. Economic sustainability of urban transport

As the fuel component is important in operating costs, and as its price is expected to increase, energy productivity measures have to be found and implemented in the whole urban transport system. More generally, productivity has to be achieved, both for public transport and for informal transport, in a scheme of complementarity.

The authorities will have to manage the progressive transfer from less efficient modes to the most efficient, taking in account the occupancy rate of vehicles; which, again, requires a hierarchical view of collective transport.

The sector will have to mobilize the new communication means (mobile, internet, etc.) in order to get a better internal management and to be more responsive in adapting the supply to the demand.

The mobilization of financial facilities seems unavoidable in order to support the huge increase of urban travel needs, and to get a higher quality of transport supply, either public transport or informal transport. Thus, adapted mechanisms have to be found, based on explicit rules and on the control of quality of service and of operators' duties.

12.1.7. Social sustainability of urban transport

No specific solutions are evident but interventions in favour of travel modes used by the urban poor have to be introduced. Walking and cycling facilities have to be preserved and developed.

The authorities also have to negotiate with informal operators to avoid the practice of 'cutting the lines' forcing users to pay twice or more the normal fare of a trip. An efficient service, provided by a bus company should be supplied, at an affordable fare, on the main transport axes of the agglomeration (priority cannot be given to bus routes inside the districts for economic sustainability reasons).

12.1.8. Urban transport institutions and governance

Despite limited experiences, an extension of organizing/regulating authorities seems required in FSSA cities, although local particularities should always be considered. Every city has to find its own scheme which has to cover the whole collective transport system (organization, management of contracts and licenses of operators, planning, etc.). If possible, its activities could be extended to other aspects of the urban mobility system but one has to be cautious on the risks of a too big structure.

It is also important to give time to the implementation of the institutional reform (which also depends on the level of decentralization) in order to get progressively more efficient authorities: it could be useful to define realistic steps in the reform. Before the formal creation of such authorities a preliminary step is the creation of a coordination committee grouping the main concerned institutions for exchanging information on their actions and discussing the consistency of their main projects in reference to the urban transport policy.

12.1.9. Integrated land-use and transport planning

The transport system and informal transport in particular contribute to urban sprawl.

The solutions which can be proposed are based on multi-pole schemes where non-motorized transport could retain an important role. In such schemes, the authorities have to be careful to promoting mass transit lines linking the poles centres.

In this view the planning of interchange stations, in dialogue with the operators but also in consistency with urban planning, is a node of a strategic approach.

Whatever the case, a strategic approach of incremental planning has to be encouraged instead of a too rigid and inefficient approach. This involves continuous monitoring and adaptation processes which would integrate more explicitly land-use and transport planning.

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