FAO Inter-regional Programme
"Food Supply and Distribution to Cities"

"Food into Cities" Revue

TRANSPORT AND INTER-MARKET SUPPLIES IN AFRICAN CITIES

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Communication delivered to the Sub-regional FAO-ISRA Seminar
"Food supply and distribution in francophone African Towns"
Dakar, 14-17 April 1997

(working paper)

DT/1997E - ? ? FAO

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Acronyms and abbreviations

BRCTU	Bureau de régulation de la circulation du transport urbain
HGV	Heavy goods vehicle
NMV	Non-motorized vehicle
LGV	Light goods vehicle

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Introduction

In all African towns specific modes of transport – mechanized and non-mechanized – have developed which play an essential role in distributing food between different markets and supplying the whole informal trading sector.

These modes of transport, which provide an ideal service for the small volumes handled and the weak financial capacity of the wholesalers and retailers, play an essential role in maintaining low-cost inter-urban redistribution.

What is known about the "artisanal" sector of urban goods transport? What is the role of non-mechanized transport and its importance in this field? These are the questions that this paper sets out to address.

After describing the modes of transport for redistributing food in various African cities – N'Djamena, Bobo-Dioulasso, Conakry and Dakar – and in the capital of Madagascar, Antananarivo, the paper examines their main features, particularly the vehicles used, the customers served, the services offered and the charges for them. It concludes with an examination on the extent to which the service they provide in supplying the towns and their inhabitants is taken into account and acknowledged.

1
Modes of transport for urban goods in Africa and Madagascar

1.1
Modes of transport in the Sahelian cities: N'Djamena and Bobo-Dioulasso

1.1.1
N'Djamena

The city of N'Djamena covers an area of some 5 500 hectares on the banks of the River Chari at its confluence with the Logone, and extends 15 km from east to west and 8.5 km from north to south. The city, with a current population of around 800 000, has 12 markets located in various areas. The principal markets are the Central market, which has about 3 300 traders, and the nearby Millet market (only 500 m away), which stands on about 9 hectares and has 5 500 traders. Together they make up a huge multipurpose commercial site, with each market playing a different but complementary role. The Central market has become the popular place for fabrics, clothing and toiletries and certain foodstuffs (meat, fruits and vegetables, with a strong predominance of European

vegetables and imported fruit). The Millet market is the capital's main general market for all staple local and imported goods as well as numerous handicraft products (pottery, matting, etc.), building materials and furniture.

These two markets operate as the largest wholesale markets for all local foodstuffs (cereals, root crops and fresh and dried vegetables) and staple food items (rice, sugar and flour). A substantial proportion of these foods comes from the re-export trade with Nigeria and Cameroon. The goods travel by barge from Kousseri (the large frontier town in Cameroon on the opposite bank of the Chari) and are unloaded at the river customs post, which is less than two kilometres from these two markets. There is a great deal of coming and going between these three poles, and between them and the secondary markets.

The transport of goods to supply the markets is carried out almost exclusively by non-motorized vehicles (NMVs); the artisanal taxis and public transport (minibuses and covered pickups) are used for the transport of retailers and their hand-loads.

Two types of non-motorized vehicles are used in the capital: the traditional rickshaws, which make up the majority of the vehicles, and two-wheeled carts. The carts can carry up to 2.5 tonnes (typically 30 sacks of rice weighing between 80 and 90 kilos each) while the rickshaws can carry between 100 and 600 kilos. Most of the rickshaw and cart operators rent their vehicles from proprietors who sometimes own several dozen vehicles.

Cart transport

Virtually all the staple foodstuffs imported through Kousseri travel by carts, which service the following routes, although the first two are the most important:

- customs to Central market and neighbouring wholesale stores in Avenue Charles de Gaulle (1 km);
- customs to Millet market (2 km);
- customs to markets at Choléra, Diguel and the New market at Diguel (4 km); the latter destination has become quite common since a new staple foodstuff storage zone has been developed;
- less frequently, customs to Dembe market (5 km); this secondary market specializes more in fruits and vegetables, and is mainly supplied from the Central market (trans-shipment).

The cart operators therefore supply all the wholesalers at the central markets and the markets in the north and northeast districts. They make five to seven

journeys a day between customs and the city centre (Central market and Millet market) and average two journeys a day to the secondary markets, mainly with rice, flour, barrels of oil, bundles of second-hand clothing, and cartons of canned food. The cart operators transport between 20 and 30 sacks a day and charge CFAF 75/sack from customs to the Central market, CFAF 100/sack to the Millet market, and CFAF 150/sack to Choléra, Diguel and Dembe.

Rickshaw transport

Rickshaws carry most of the food and manufactured products between the two main central markets, and from them to the secondary markets, the shops of the traders in the neighbourhoods and private homes. Most of their customers are market retailers and shopkeepers; private customers account for only a very small percentage.

Approximately 600 rickshaws congregate around the Central market and the Millet market where they are in great demand for trade between the markets. At the Central market they wait at both wings of the market, and at the Millet market, they gather around the Allée Centrale by the areas used for unloading and storing local cereals and root crops. Fares vary between CFAF 75 and 250 depending on weight and distance. For example, the charge for carrying a sack of onions or rice (weighing between 80 and 90 kg) between the two main town centre markets is CFAF 100.

1.1.2
Bobo-Dioulasso

The organization of urban goods transport to supply the markets is somewhat similar to the situation in N'Djamena: non-motorized transport is predominant (rickshaws and two-wheeler and four-wheeler carts) while a complementary but secondary mode of transport is the network of collective taxis.

This situation is interesting for two reasons. Firstly, the use of NMVs by the modern "formal" sector, shows the flexibility of this mode of transport and contradicts the view that it is linked solely to the traditional market sector. Secondly, competition exists within this same mode of transport between the same types of vehicles. It should be noted that rickshaws can only carry around 200 to 400 kilos, two-wheeler carts carry less than a tonne, while four-wheelers can take up to around 2.5 tonnes.

Bobo-Dioulasso, with a population of 300 000 in 1990, has 15 multipurpose markets and 8 specialized markets, none of which are more than four to five

kilometres from the Central market, which is the main redistribution centre for food and manufactured goods. The Kikasso Cira wholesale market, which is about two kilometres from the Central market, specializes in fruit and root crops, although its main function is to redistribute goods to the capital of Burkina Faso, to towns in Mali and, above all, to Niger. Fruit and root crops for local consumption are taken by cart to the sheds of the sub-wholesalers at the Central market, from where they are taken by rickshaw or cart to the neighbourhood markets.

The town centre of Bobo-Dioulasso is a kind of huge commercial and administrative complex. It is the location of virtually all the warehouses of the local produce wholesalers (mainly cereals) and importers (food and manufactured goods), most of the municipal government offices and public services, the head offices of large corporations, banks, and the hospital. There is a very large six-hectare market with over 6 000 traders selling on the roads in the neighbouring streets. This entire complex covers 150 hectares in the shape of a triangle about one kilometre deep and 1.5 kilometres wide at the base, with the former railway station at the apex, the Central market in the centre and the city hall at the base.

The warehouses and parking places for heavy goods vehicles (HGVs) occupy a substantial part of the area and extend over onto public land. Three unregulated freight centres have been set up where large trucks from Côte d'Ivoire, Mali and Togo park, while waiting for orders, after having unloaded their freight alongside the premises of the licensees and trading companies. There is also a great deal of movement between this commercial centre and the railway station, which is less than one kilometre away, and particularly between the bonded warehouses and the private warehouses linked to the rail/road freight system.

Rickshaws, and, above all, carts, carry all these goods over very short distances: from the trucks to the warehouses, and from the warehouses to the informal truck depots and the stores of the market traders, and lastly from the railway station to the shops and traders in the town centre. There are over 25 parking places for NMVs scattered throughout the area. In 1991 the two-wheeler cart operators complained bitterly about competition from the four-wheeler cart operators and their future seemed to be very bleak.

Unregulated trade in re-exported second-hand clothes and imported fabrics is a major factor in the reputation and business flair for which the Bobo traders are known. Fabrics and second-hand clothes pass through Côte d'Ivoire, are cleared at the Bobo station customs post and then re-exported to Côte d’Ivoire by the vast network of smugglers. The stores of the largest wholesaler-importers of

second-hand articles and fabrics are all lined up opposite the Central market. The traders organize the storage of the containers in the railway yard and then use carts to transport the goods to their shops. It is not uncommon to see an endless procession of carts (including many two-wheelers) making their way in single file from the station to the shops carrying tonnes of bundles of second-hand clothes from these containers, causing incredible traffic jams just at peak traffic time around the market

The regulations state quite clearly that trucks are prohibited from unloading around the market at peak traffic time in order to avoid obstructing the traffic. It was noted that although the truck drivers delivering produce to the market wholesalers are issued fines when they park opposite the market, the importers using the carts do not seem to have this problem, a good example of double standards.

1.2
Modes of transport in two main port cities: Conakry and Dakar

1.2.1
Conakry

Conakry - with a population of 1.2 million in 1990 - has about 20 multipurpose markets in addition to 12 specialized markets for building materials, construction timber, fabrics and artisanal fishing products. Because of the geographical shape of the peninsula, which is a long strip of land, there are 14 organized markets and 6 specialized markets set up along the main road, which is the principal artery out of the southern part of the territory. On average, there is a market along this road every two kilometres and the furthermost market is about 17 km from the town centre (Madina). The northern coastal road, which at the present time is partially tarred, has only three markets.

The two major flows of goods, which make up the backbone of Guinea's trading system, meet at the Madina market and the surrounding area. It is here that food supplies for Conakry arrive together with imported goods (rice and other staple foods, manufactured goods, building materials) to supply the city and the interior of the country. The Madina district is therefore the most important freight-handling centre in the country and Guinea's main storage centre. Virtually all the warehouses of the main wholesaler/importers of rice, sugar and flour are grouped along the three or four main roads to the south of the Madina market. It is here that the vehicles are loaded to supply the interior; all the shopkeepers specializing in the foodstuffs sold at the 20 or so markets that exist in Conakry purchase their supplies from these warehouses.

The Madina market is the largest for products manufactured in the town and is also the largest foodstuff wholesale and retail market. Whatever trans-shipments take place along the national highway at any of the wholesale markets at Matoto, Gbessia or Bonfi, the final destination of all the hauliers is the wholesale market (Nyenguema) at Madina. In 1986, over 10 000 traders and about 400 food wholesalers were recorded in the whole of the commercial zone.

A transport system used strictly for goods traffic carries building materials (sand, cement, blocks, etc.), and all the staple food supplies (rice, salt, sugar, flour and canned foods) for the wholesalers and the shopkeepers. This system has its own truck depots and operates around four points in the peninsula: Conakry 1, near the port; Matam Lido, close to the large centre market of Madina; Hamdalaye, on the northern coastal road and Enta on the national highway. Old Soviet-manufactured jeeps (ITCO) are used together with ZIL trucks to transport substantial loads (between one and five tonnes). This system is perfectly suited for the needs of small-scale traders and private individuals who are unable to find transport facilities suited to their needs in Conakry.

There are different types of transport for food depending on the direction in which it is transported. Non-motorized vehicles (NMVs) link the small urban ports where paddy, salt, palm oil, fish, construction timber (mangrove wood) are unloaded with Madina, and Madina with the neighbouring markets. Four-wheeler carts and rickshaws cover these very short distances of north-south or south-north traffic (between one and two kilometres).

Transport from west (Madina) to east (the various markets on the national highway) covers long distances and is carried out almost exclusively by motorized vehicles. "Alakabon" collective taxis handle most of the motorized transport of goods between the markets together with the pickups and "1 000-kg" minibuses. Most of the customers are retailers transporting their goods from Madina, or from the ports to the markets at which they trade.

Women traders prefer the 1 000-kg minibus, mainly because of the lower cost: FG 50 for the trip and FG 50 for any package, compared with the taxi fare of FG 100 for the trip and between FG 200 and 500 for a package. The minibuses, however, are less safe and because they are so old, accidents occur on a daily basis.

There is a very small narrow difference in retail prices among all the Conakry markets, while retail prices at the Madina market are much lower. The lowest wholesale and sub-wholesale prices can also be found at Madina for every

commodity. For example, retailers from Taouyah or Tanene can buy a sack of rice at Madina at a better price than they can from specialized rice traders at their own markets, and this is a source of complaint by the retailers who have to pay high transport costs.

1.2.2 Dakar

The population of Dakar is approximately two million, with one million situated in the municipality of Pikine. The main wholesale market for fresh produce in Dakar is in the municipality of Pikine near the Thiaroye station (from which the Thiaroye-Gare market gets its name). The market extends along both sides of the railway line over a distance of 970 metres, and continues for a further 250 metres along the paved road in the district bordering it to the east. The Thiaroye market is a major source of fresh produce, handling the entire vegetable crop from the main production regions of Senegal (the zones of Nyayes, Cap-Vert, Casamance, the gardens at Keur Massar or the nearby Nyayes region). It is also the market with the lowest prices for vegetables as well as manufactured goods, making it well known and important well beyond the municipal boundaries.

There are approximately 4 500 traders at the Thiaroye market, in addition to 3 300 itinerant traders who occupy the surrounding roads and the railway line. The wholesale market (commodity market) has from 700 to 1 400 wholesalers and middlemen, depending upon the season.

To the southwest of the Thiaroye market is one of the two largest timber markets in Dakar. This timber market is used almost exclusively for the purposes of celebrations (preparing food for baptisms, funerals and marriages) It is also used by the artisanal woodcarvers in the capital.

The Thiaroye market is served by various modes of transport: buses, rapid buses, official and unlicensed taxis, travelling in every direction possible, as well as the "little blue train" (Petit train bleu). Their destinations are very clearly identified. Conventional taxis, light vans, small covered pickups and the rapid buses, known as "work buses", cover long distances between Thiaroye and the markets in Dakar City (between 10 and 17 km). Horse-drawn carts are used for redistribution to the markets of the densely populated municipality of Pikine.

One particular aspect of this commercial pole is the fact that it is possible to reach the very centre of the market using the little blue train with reserved lanes, which has now become the most effective mode of transport in the Dakar region. There are more than 12 trains a day running in both directions (each train

carrying 240 passengers seated and about 1 500 standing). The train is not only used by the people living in the outskirts who commute between their home at Pikine (Keur Massar, Malika, etc.) and their workplace in Dakar, it is also the mainstay for thousands of women traders. They travel from Dakar and all stations east lying between Thiaroye and Rufisque to the Thiaroye market to sell M'Baw smoked fish and Casamance produce from Ziguinchor, which is unloaded on Tuesdays and Fridays in Dakar harbour. They also buy vegetables for resale at the city markets.

1.3

Modes of transport in Madagascar: Antananarivo

In 1991 the population of Antananarivo was about l.5 million. Because of the geography of the zones that supply the Malagasy capital, two large wholesale food markets have developed at the trans-shipment sites used by trucks and vans. The first and the most important of these, Anosibe, grew up spontaneously at a truck depot site on the plain to the west of the city; the second market, Andravoahangy, lies to the northeast in the hilly part of the capital. The Isotry market, which is located in the city centre near the railway station, is officially the only wholesale market in the capital. Since the beginning of the 1980s, however, it has lost much of its redistribution activity to the two other wholesale markets. The central market of Analakely is the main market for manufactured products, and with its weekday fair, called the Zoma, it is a commercial centre for some 9 000 traders. It does, however, handle certain green vegetables for redistrubtion.

Goods for sale at the district markets (there are 42 in the Malagasy capital) and the neighbourhood stores are transported by both motorized and non-motorized vehicles. Manufactured goods and food (cement, sugar, flour, salt and white rice), which are imported and/or distributed by the large government corporations, are transported by old dilapidated vehicles with a carrying capacity of three or four tonnes. These vehicles, which are found in special truck depots near the railway station close to the Tsiralalanane district, are used by wholesalers and also by many small grocers who pool their purchases and together hire one vehicle for deliveries to their shops. These old vehicles may be used during the day whereas heavy goods vehicles are not allowed in the city during the daytime.

The motorized vehicles used for food transport are mainly 3 hp vans. There are also a number of covered pickup trucks serving several markets that carry the peasant farmers with their produce from the peri-urban vegetable-growing areas.

The non-motorized vehicle park consists of wagons, wheelbarrows, rickshaws and four-wheel horse-drawn carriages. The wagons (four very small wheels and a board) are used both for water transport in the neighbourhoods and for food transport from the nearby vegetable-growing areas in the east as far as the Andravoahangy market. They are not found anywhere else. Manually hauled four-wheel carts are only used at the large timber market near Isotry. Horse-drawn carriages operate only on one route between the two large wholesale markets at Anosibe and Isotry.[1] They are used by food retailers in the outlying districts to the west and northwest of the capital.

The best non-motorized vehicle for transporting goods between the markets is the rickshaw. The Malagasy rickshaw rides high (the wheels are larger in diameter than African rickshaws); it can carry up to 500 kg of goods and operates within a radius of about seven kilometres. The largest rickshaw parks are by the markets at Anosibe and Analakely. There is, however, a degree of competition between the rickshaws and the 3 hp motorized vehicles, which transport between 300 and 500 kg of goods. Their prices are virtually the same, although the rickshaw seems to be holding its own. It has its own customers and its own service networks, which are not necessarily accessible to motorized vehicles. In the steep hilly parts of the city or where there are no proper roads, or where the streets are very narrow, the only form of transport for small-scale retailers and wholesalers is the rickshaw.

It should be emphasized that buses carry a considerable amount of merchandise to all the small markets located away from the city centre in the northern and eastern districts. The Analakely market is in the centre of the urban public transport network.

2
Features of urban goods transport

Table 1 lists the various modes of urban goods transport in Africa and Madagascar[2], classified in terms of the following criteria:

- modes of transport: non-motorized (NMV) and motorized vehicles;
- specialized and other goods transport (combined transport: passengers with merchandise);
- urban transport sector: collective passenger transport or goods transport (urban freight);
- type of organization: modern companies and the artisanal sector;
- modes of traction.

Table 1
Modes of urban goods transport to supply markets in African cities

Modes of urban transport	NMV		Motorized	
Urban transport sector/ Organization/mode of traction	Combined goods	Specialized	Combined goods	Specialized
Passenger transport Modern companies			 Bus Train	
Artisanal sector Vehicles			One-person taxis Collective taxis (5 to 15 seats)	
Two-wheelers			Zemidjan (moto-taxis)	
Urban freight Artisanal sector Vehicles (0.5 t- 6t)				Vans Light trucks Medium trucks 4L , 3 hp, Rapid buses, Jee Covered pickups, Saviem, etc.
Animal traction (donkey, horse) (0.3t-1.5t)	Carriages	Carts		
Individual manual traction (<0.180t) Two-wheeler (0.03t-1t) Four-wheeler (0.3t-2.4t)		Bicycles Rickshaws Carts Wagons Carts		
Walking; porterage				

Urban goods transport for the markets and the small-scale traders in the outlying districts has the following features:

- it is multimodal;
- it includes both collective and individual passenger transport, and is also served by a specific urban goods transport organization specializing in supplying markets and small-scale wholesalers;
- it has its own specific vehicles and truck depots;

- it is mainly organized by the artisanal sector.

2.1
Urban goods transport for inter-market supply and redistribution

The three main types of urban transport used are motorized transport, non-motorized vehicles (NMVs) and porterage.

It should be recalled that walking remains one of the main ways of moving around African towns. The data available on this is scarce, widely varying in quality and "varying widely depending upon the methodologies used; however all the evidence indicates that walking is practised a great deal in many African capitals".[3] Porterage covers short distances and is used by very small traders. The load carried on foot cannot exceed 30 to 50 kg for a woman, and no more than 80 kg for a man. No information is available on the extent to which porterage is actually used as a mode of transport to supply the markets. It is likely that there is widespread use of porterage in the very small towns (towns with populations under 100 000).

Urban goods are delivered by road; the example of rail transport (the little blue train) in Dakar is still an exceptional case at the present time. In the very large African citiess, however, modes of rail transport using reserved lanes will inevitably develop and be used by the market retailers.

Although boats (pirogues, etc.) play an important part in supplying some cities (e.g. Kinshasa, Cotonou, Conakry) the known cases refer exclusively to the upstream sector of the transport of products destined for the large markets, and not to redistribution in the towns.

2.2
Inter-market transport: collective passenger transport vehicles and specific vehicles

Collective passenger transport is provided only in large cities and generally by public-sector companies, while the artisanal sector dominates the market everywhere, providing between 57 and 95 percent of collective transport in most African cities, except Kinshasa where it provides 44 percent and notably Abidjan where it provides 25 percent in a 1989 estimate (Mandon-A., 1994, *op.cit*.).

Buses generally play a marginal role, or are used only in very specific situations, in terms of transporting products between markets. For example, one reason buses are used by women retail traders located in remote districts in the city of

Antananarivo is the fact that all the bus routes in the city serve the Analakely market (which is still a major centre for the supply of certain fresh products). Another reason is that special fares are continually negotiated with the drivers, on condition that the products are transported during off-peak hours (between 5 a.m. and 7 a.m).

In this regard the case of the little blue train is exceptional. The needs of the traders involved in redistributing goods between the markets are taken into account specifically in terms of the fare scales (a market ticket), timetables, and the organization of the servicing of the depots (waiting time for loading, unloading, volumes carried).

Most of the urban passenger transport is organized using vehicles belonging to the artisanal sector: the individual and collective taxis. The category of individual taxis includes the Cotonou (or Zemidjan) motorcycle-taxis that carry passengers with their loads. Because of the generally high prices charged by the individual taxis (the passenger fare plus the charge for carrying merchandise), only certain categories of traders use them for a limited quantity of goods.[4]

Collective taxis (including cars carrying five passengers, different types of small vans and minibuses with a capacity of up to 25 passengers) generally carry mixed freight on the incoming transport routes. They are used by the small-scale farmers and traders coming from the countryside or from the provincial towns with their produce to offload at the large urban supply markets. Conversely, the role of the collective taxis in transporting goods for redistribution within the town is extremely variable. It depends on a variety of parameters: the size of the town concerned; the number of passengers; the routing network and the ranking of the collective transport facilities; the organization of a specialized urban freight traffic sector; and, the general economic level.

At Conakry in 1988, at a time when incomes and living standards were extremely low, the Alakabon and the 1 000-kg minibus, which are on the lowest rung of the ladder in public transport, were the most commonly used vehicles at the time for inter-market transport. They were the only vehicles that would routinely accept women traders and their merchandise at a very low price. The inhabitants of Conakry were well aware of the high safety risks involved as well as the uncertainties of passenger stops left to the driver’s discretion.

The transport of goods by passengers on the traditional urban vehicles, conventional taxis and minibuses is necessarily subject to numerous constraints in terms of ease (volume), price, and time (the number of stops made before reaching the seller’s market in the case of collective transport).

2.3

Urban transport of goods: a specific sector of urban transport

In every city there is a specific urban transport sector that specializes in carrying goods between markets and supplying small wholesalers. They have their own specific vehicles, motorized and otherwise, as well as their own depots, most of which are frequently unregulated.

The motorized vehicles are small vans (3 CV, 4L, etc.), small trucks and pickups (covered trucks, old jeeps, etc.), light trucks (mostly three- to five-tonne capacity) and very rarely heavy trucks (seven tonnes) such as those found in Antananarivo. The typical load of the small vans is made up of different kinds of foodstuffs weighing between 300 and 500 kilos. The small trucks and pickups carry an average of one tonne and are used by the retailers who organize group transport and by the small wholesalers. Heavy trucks typically transport foodstuffs and construction materials, although it should be noted that they are rarely fully laden, and that when they do carry more than three tonnes they are usually composite orders placed by several wholesalers. These different types of vehicles are always second-hand and mostly superannuated.

The non-motorized vehicles include bicycles, two-wheel manually drawn vehicles (carts and rickshaws) and four-wheel manually drawn vehicles (carts and wagons), and lastly animal-drawn vehicles (horse- or donkey-drawn carts), and, for example in Antananarivo, a small number of horse-drawn carriages. NMVs are concentrated mostly at the markets or in their immediate vicinity. The carts may also be linked with a commercial centre, however, such as a customs post (the river customs post at N'Djamena), small ports (Conakry), a wholesaler district (Bobo-Dioulasso, Antananarivo, etc.).

Surveys have shown that bicycles carry up to 180 kg, while rickshaws and two-wheel carts carry an average of between 200 and 500 kg, reaching 600 kg in the case of some rickshaws. The four-wheeled carts carry loads of up to 1.5 tonnes. Some two-wheel carts can even take 2 tonnes, in which case (only found at N'Djamena) the cart driver has two assistants.

Both the rickshaws and the horse-drawn carriages at Antananarivo were formerly passenger vehicles (the carriage was known as “the poor man's bus”, and the rickshaw the taxi of the “peasants” arriving in town). They have gradually been adapted to meet the increasing urban freight transport demand throughout the vast informal sector of markets and small shops. In the case of the Senegalese animal-drawn cart, which carries a load of about 1.5 tonnes, the only passenger

accepted would be the owner of the merchandise being transported.

The NMVs are found in every town, regardless of size. It is not an archaic mode of transport in towns with certain traditions; it is very highly developed in large towns in Asia. It is therefore not specific to any particular stage in the urbanization process, or in the development of modes of motorized transport, but co-exists easily with motorized modes of transport, sometimes even competing with them on certain routes.

The distances, the topography of the town and the organization of the traffic system impose certain constraints on NMVs:

- NMVs are the best mode of transport for fairly short distances (between two and seven kilometres at most) after which motorized transport takes over, offering more efficient services. The example of Conakry is a perfect illustration of this complementarity along the supply and redistribution routes by NMVs (north-south routes of between 1 and 3 km) and motorized vehicles (west to east routes between 3 and 15 km).

- In Antananarivo, NMVs are more suitable for some hilly parts of the town than other modes of transport. In the areas built on the hills, rickshaws are the only means of transport that can be used over short distances. For longer journeys and on steeper roads, rickshaws and motorized vehicles compete. Charging essentially the same fare, the choice of the mode of transport will therefore mainly depend on the volume of merchandise being carried, the speed of the service required and the relations established with one or other type of transporter.

- In Dakar, animal-drawn carts are banned inside the boundaries of the municipality of Pikine (roughly coinciding with the Capa district) to prevent traffic congestion in the city centre. However, as the wholesaler district in the centre of Dakar is the ideal place for rickshaws and carts, which are used for unloading the large trucks and making deliveries to the wholesalers, enormous traffic jams take place.

Taking all modes of transport together, the majority of vehicles carry less than one tonne. The medium trucks carry less than three tonnes, generally in the form of composite orders.

The service provided by these vehicles is the "hidden face of transport" in African towns. But this is true in so many other places, and it would be useful here to refer to the problem of urban goods transport in European towns, as

described in a recent article on this subject:

> *"Urban goods transport is as invisible to commercial, technical and social law as it is concerned to public law. Even though goods delivery is very important in terms of the law (...) it must be noted that 'urban goods transport is not a juridical category of activity'. There is no precise definition of what is meant by urban transport apart from the definition of the trade of an urban transporter, since most of the tools and the regulatory requirements (entry into the trade, nomenclature of jobs, wages ...) only refer to vehicles of over 3.5 tonnes. This ceiling of 3.5 tonnes is the main criterion used to draw a number of social, technical and commercial distinctions up to which level there is no salvation -- indeed no existence at all."*

Anything under 3.5 tonnes is therefore considered to be a light goods vehicle (LGV), and although they account for most urban goods transport (60 percent of the vehicles/km), they mostly fall outside the scope of regulatory constraints. "The urban goods vehicle does not exist" (Dufour, 1996).

2.4 The number of urban goods vehicles: NMVs and motorized vehicles

Data on the numbers of these vehicles, whether gathered for specific surveys or from the government departments responsible for transport and traffic, is often kept by the local authorities. Generally the number of NMVs is underestimated, and no information exists to distinguish between urban goods vehicles and other vehicles (light goods vehicles). Here are a few figures to provide some idea of the numbers involved:

- At N'Djamena, there were 1 200 carts and rickshaws in 1991 according to the city hall authorities, but 2 400 carts and rickshaws according to the Transport Directorate.

- At Bobo-Dioulasso, according to city hall authorities, there were about 600 NMVs in 1989, but other sources put the figure much higher.

- At Bamako, in 1990 the Bureau de régulation de la circulation du transport urbain (BRCTU) recorded 2 912 NMVs of all kinds (bicycles, rickshaws, animal-drawn carts and boats) but only 2 107 in 1993 (it is not known why the figure fell). According to BRCTU and the district governorate, this figure was underestimated by 40 percent; in 1993 there were actually more than 3000 NMVs, of which barely 10 percent were bicycles.

- At Ouagadougou, in 1996 the city hall recorded 2 800 carts (four-wheelers, donkey-drawn and water-distribution carts in the neighbourhoods), of which water carts accounted for about one-half. Once again these figures are underestimated.

- At Antananarivo, the number of NMVs fell drastically between 1955 and 1972 from 2 200 to only 60. A survey of the artisanal NMV sector in 1985 found that there were about 500 at that time. In 1993 it was noted that this was a particularly flourishing sector: at the Anosibe market alone there were 300 vehicles and a rapid study of urban traffic showed that the NMVs (mainly rickshaws) accounted for about one-half of the internal traffic in the capital.

- At Dakar in 1994 there were 300 carts, according to the municipal authorities of Pikine, although this figure was acknowledged to be rather unreliable. It is not known exactly how many rickshaws and carts there are in Dakar City. It is even more difficult to estimate the number of motorized vehicles, which can be done accurately only by carrying out a specific survey.

- At Conakry in 1989 there were between 15 and 30 vehicles linked to each of the three truck depots identified. It was not possible, however, to find information on the question of regular hauliers (those who accept the rule of the organization set up by the drivers) versus the occasional hauliers, whose numbers are reportedly growing.

At Antananarivo the number of goods vehicles was very small (averaging 10 for each truck depot) and there was the same problem of identifying the regular and the occasional hauliers. Yet Antananarivo and Conakry share almost identical features in terms of living standards and incomes, and as capitals of countries which have been through a long period of government intervention in marketing and food supply. In Senegal, where the level of development of the economic circuits is quite different, at the Thiaroye wholesale market (the city of Dakar, municipality of Pikine) over one hundred regular vehicles (vans and pickups, 4Ls and 504s) were counted in 1996 at the official truck depots alone. It is not known how many 'work buses' with market season tickets there are in Dakar, but there must be a large number according to the various sources.

One can compare these figures with the number of vehicles providing collective transport. For example in Lomé (with a population of about 800 000 in 1993), where the provision of this type of transport is considered satisfactory, there are about 3 000 collective taxis. In Bamako (with the same population) the total number of vehicles in the artisanal sectors is just over 1 000, with less than 100

buses, which is insufficient even though the official data is no doubt underestimated.

As far as NMVs are concerned, Africa does not have as many as certain Asian countries.[5] A quick overview based on available data, however, shows that the NMVs frequently run into thousands in cities with populations of 600 000 to 800 000. Although accurate figures on motorized vehicles are not available, the example of just one wholesale market in Dakar shows that in a city of this size there may be several hundred. It is therefore by no means a marginal sector.

2.5 A transport service tailored to meet the needs of the informal trading sector and private individuals

These modes of transport are perfectly geared to meet the specific goods-transport needs of market retailers, small food wholesalers or private low-income earners. Although the traders make up the majority of regular customers of urban goods transport, the inhabitants of the city are also frequent users. They use it for the transport of their staple commodities (sacks of rice and cans of oil) and for all bulky and voluminous objects, particularly construction materials (a fundamental aspect of the economy of the city inhabitant town is do-it-yourself building). Truck transport, which could be provided by local companies, would be inaccessible to them because it is very costly, and as far as the traders are concerned it does not have the necessary flexibility to provide services that accurately match their specific needs.

By choosing transport by cart, rickshaw or specialized motorized vehicle, the traders are provided with several essential services and advantages:

- savings on maintenance costs (loading and unloading operations are carried out by the drivers and their helpers, whether NMVs or specialized vehicles);
- goods of several traders can be pooled together;:
- the choice of many different vehicles with different carrying capacities and costs;
- NMVs are available at the workplace and in the neighbourhoods where access may be more difficult;
- relations are on a more personal basis;

- deliveries can be organized so that the trader is free from the obligation of accompanying his or her goods; they can be delivered at a specific time in a given place (rapid bus collection routes, delivery by cart, rickshaws, etc.).

2.6
The cost to users of urban goods transport

In the case of NMVs and all motorized vehicles with a small carrying capacity (4L, 3CV, etc.), fixed prices are set at a per unit rate depending upon the typical weight of the product (a sack of rice, a 25 kg basket of vegetables, etc.). For larger trucks charges are made by the tonne. Prices obviously vary depending on distance and load volume, which makes pooling an attractive proposition. Prices can also vary – and this applies particularly to the NMVs – depending upon the time of day, competition from the "irregulars", the financial needs of the drivers (at the beginning or the end of the day), and the agreements established with the customer (season ticket holders vs. occasional customer).

Transport costs in terms of tonne/kilometre for typical loads according to the vehicle are set out in Table 2 below.

Table 2
Urban freight costs for food supply and redistribution in Africa and Madagascar

CFAF/FMG /FG/t/km

Mode of Transport	Motorized vehicles					Non-motorized vehicles				
Type of vehicle	4L 3CV Van	Pickup	Collective taxi	Truck Work bus	MGP ZIL 3T 7T	Bicycle.	Rickshaw	2-wheel 4-wheel cart	Horse-drawn cart	Carriage
Dakar	300-1 700	400-2 000	200-1 000	100- 1 000					300-2 000	
N'Djamena							500-1 500	370-1 500		
Bobo-Dioulasso							500-1 400	400-1 200		
Conakry		500-1 200	80-1 000		200-700			800-1 200		
Antananarivo	900-1200	500-1 200			90-500		500-1 000	500-900		500-700

What is interesting about these figures is not the comparison between prices in different cities (the tariffs are set out in three different currencies) but the relations that can be established within the same cities between the prices of

different modes of transport available there.

Transport charges for rickshaws and carts are virtually identical in all three Sahelian cities. The prices in terms of tonnes/kilometre for average loads of 0.2 tonnes (rickshaws) and 1 tonne (four-wheel cart) lie between CFAF 400 and 1 200 according to the length of the journey (2-5 km) at N'Djamena and Bobo-Dioulasso (before devaluation) and between CFAF 300 and 2 000 at Dakar (2-10 km).

In each of the cities examined no major differences exist between the average cost of motorized vehicles and NMVs with an equivalent carrying capacity (4L, 3CV) and the rickshaws, pickups and carts. At most there is a slight increase in the average price for the NMVs compared with the motorized vehicles (the difference has to do with the short journeys and the small quantities transported by the majority of NMVs, which are two criteria for high transport costs).

For motorized vehicles, the law of decreasing returns that is typical of the freight transport comes into its own: the prices for vehicles covering 12 to 15 km carrying between one and two tonnes are the lowest of all the different vehicles (Conakry and Antananarivo).

The prices are particularly low for small quantities carried over long distances. For examples, two cases (about 15 km each): the collective transport facilities in Conakry (the Alakabons and the 1 000-kg minibus) and the season-ticket system for the Thiaroye work buses plying the Thiaroye-Castors route at Dakar (FG 80 and CFAF 100 tonne/kilometre respectively).

In the final analysis, the choice made by the traders between different forms of transport certainly depends on cost (particularly when choosing between conventional taxis and other modes of transport). Above all, however, it depends on the quantity of the goods to be carried, the distance, the way in which the destination market is serviced by public transport, and the speed at which the delivery is to be made. The result is a fragmentation of the transport market with each type of vehicle dominating one particular market segment for one particular route, one particular type of commodity transported, or one user category.[6]

Although the goods transport service is organized to perfectly match the demand of traders and private individuals, the market retailers are faced with the daily problem of travelling between their homes and the supply markets, and between the latter and the markets where they normally sell their goods. The cost of these journeys can sometimes be high, even higher than the freight cost itself.

3
Insufficient recognition of services by the authorities: facts and input for further consideration

On the very specific sector of urban goods transport in Africa, a number of questions must be asked and various avenues explored in relation to the way these services are viewed, the policies applied to them, the degree to which their important role is taken into account, and the measures which could be implemented to improve their efficiency.

3.1
General lack of information

A general lack of knowledge exists concerning the way in which urban goods transport in African towns operates and its organization. As pointed out in section 2.3, it is not only regarding Africa that this lack of knowledge exists, and although urban goods transport is now attracting greater interest in Europe today, it is a particularly recent phenomenon.[7] A preliminary investigation must therefore be carried out to become more familiar with this sector and its constraints.

3.2
The inland revenue authorities are aware that the sector exists

The authorities know of the existence of these persons, on two counts. Firstly, most drivers pay for a licence and like all transporters they pay a large number of traffic fines. Motorized hauliers also pay various vehicle taxes, in addition to indirect fuel taxes. Secondly, the NMV licence fees collected by the municipal authorities often account for a considerable proportion of direct revenues. Furthermore, some civil servants are owners of NMVs and motorized vehicles).[8]

3.3
Urban goods transport: the role of local authorities

The urban transport policy of the local authorities (in all its forms) consists mainly of setting technical and policing measures, regulating the traffic, and imposing policies to simultaneously foster the free market while maintaining inflexibility (Mandon-A, 1994). It should be recognized that the priorities lie elsewhere. The crucial problems of urban collective transport and the congestion of town centres, owing to the concentration of wholesaler warehouses, mobilize

the upper echelons of government departments and lead to the commissioning of reports by experts on modes of transport on reserved sites, truck depots, inland ports, distribution areas, etc. These problems are so important, however, that the central government authorities must take measures and make decisions.

Issues relating to the operation of markets and food distribution fall within the scope of local policy, and today we know that the municipal authorities are sensitive to such problems. This provides an opportunity to redefine the role of the local authorities in this field, firstly by gaining a better understanding and identifying the specific needs of the urban artisanal transport sector, and then supporting its development.

There are three main ways in which this support can be given:

- acting in coordination with the parties concerned;
- taking into account the needs for specific vehicle parks and sites for transporters who supply and redistribute goods within cities; not putting it off to the actual time when markets are being redesigned. This would apply generally to the whole area of a municipality; and,
- introducing more appropriate regulations and tax measures.

3.4
NMVs as a sustainable mode of transport

In the specific case of NMVs, the most common attitude found on the part of the authorities is comparative tolerance (leading to a minimum level of regulation). This is based on their conviction that these archaic modes of transport are bound to gradually disappear as modern motorized modes of transport develop.

We feel it is important in this regard, however, to emphasize the structural role of urban freight carried by non-motorized transport. The present economic situation – increasing costs of motor-driven vehicles and fuel since devaluation, development of the informal commercial urban sector, particularly in food distribution as the main subsistence activity in the towns – not only makes their disappearance most unlikely in the near future, but improves the conditions needed to ensure a permanent future for them in Africa.[9] NMVs are therefore doubly "sustainable" in terms of both time and the current understanding of the notion of sustainability when speaking of modes of urban transport (their low cost, simplicity, durability, self-reproducibility, equity, and the fact that they are non-polluting and socially acceptable.[10]

3.5

A global approach to urban goods transport in Africa

The situation described above clearly shows that motorized and non-motorized transport are complementary and that only a multimodal approach makes it possible to account for the urban freight situation in respect of food supply and redistributon in African cities.

In the same way, the trading circuits will gradually change owing to the effect of the following factors:

- the demand of urban consumers for higher quality products;
- the development of integrated distribution networks (large and medium self-service facilities);
- new facilities, such as wholesale markets where traders can become more specialized, and where some traders can increase their turnover, etc.

Any examination of the modes of transport used for urban freight must necessarily assume a global approach, which takes into accounts the needs of modern enterprises, the artisanal sector operators and the markets. To date, the latter two have unfortunately been to some extent neglected.

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[1] "Faded red and green carriages, drawn by two emaciated horses, with the hood covered with 'sobika', are the most outdated vehicles in Antananarivo .… All they are used for is to transport the vegetable sellers and market gardeners between Anosibe and Isotry. They were supposed to disappear in 1980; the urban buses were brand new and the horse-drawn carriages were dilapidated, while rickshaws could take only one person and a few baskets. But the rickshaw prices rose, as did the fares for the light vans. The 'poor man's bus' catering for the poor people weighed down with baskets and always working alone at a tiny market has therefore cashed in handsomely on the expansion of Anosibe market. Each of the 16 carriages recorded there make four round trips a day between the large market at Anosibe and Isotry. On average they carry 10 passengers and 250 kilos of goods" (G. Pourcet, 1985).

[2] These are the cities mentioned in the first part (Bobo-Dioulasso, N'Djamena, Conakry, Dakar, Antananarivo), the cities for which we already know the inter-market modes of transport (Cotonou, Ouagadougou), and the cities on which the relevant data already exists (Bamako, Ziguinchor) from other surveys.

[3] For example, according to a recent survey, in Bamako one journey in two is carried out on foot; in Lomé the oldest data shows that one-third (32 percent) of journeys take place on foot; Ouagadougou, because of the domination of two-wheelers (bicycles and mopeds), is one of the rare exceptions to the general rule (Godard and Pochet, 1995; Garcia-Oriol, 1993; Cusset and Sirpe, 1994).

[4] All passengers may carry one piece of baggage free of charge; in the case of a trader with merchandise, a charge is made for the volume transported in addition to the passenger's fare. This is decided by the driver. The driver may also refuse to take the trader if he considers that the merchandise is too bulky.

[5] "In Bangladesh, the cycle rickshaw fleet is estimated to grow from two-thirds of a million in 1988 to over one million by 2000. More than three-fourth of Bangladesh's cycle rickshaws are in urban areas. They account for a major share of urban freight movement in many Asian, Chinese, Indian and Pakistan cities. Of all land-transportation in Bangladesh, NMVs produced 60 percent of all passenger-kilometres and 36 percent of freight tonne-kilometres in 1985. Annually, each urban cycle rickshaw accounted for 32 810 passenger miles and carried 94 tonne-miles of goods" (Godard, 1994, *op. cit*.).

[6] It is for this very reason that when there is competition between two vehicles within the same mode of transport with similar customers and loads, one of the two disappears altogether (as at Bobo-Dioulasso in the case of the two-wheel carts).

[7] Speaking of the long-term national programme "Transport de marchandises en ville lancé en France en 1994", the author points out that "this programme is principally directed at the authorities to provide them with the tools they need to act and evaluate. It is designed to provide an approach to analysing urban logistical flows as a whole, not focusing so much on the actual flows themselves but rather on the activities that generate these flows. When speaking of 'understanding the urban flows and movement of people and goods generated by the economic activity of the tow*ns*' the term 'understand' is used to show that it is not so

much a matter of beginning by studying concrete measures but rather of inventing methods to analyse and make up for the almost total lack of data and circumstantiated descriptions" (Dufour, 1996).

[8] This is a well-known situation in the case of collective transport and individual taxis, but it also applies to NMVs and specialized vehicles. Throughout the artisanal transport sector, hauliers are either lessees or proprietors. See, for example, the case of the NMVs in Bamako where a study carried out in 1995 showed that 63 percent of the sample studied leased their vehicles.

[9] It should also be recalled that NMV transport is one of the activities taken up by migrants in order to become economically integrated into the urban environment, and that the activities generated by this mode of transport (vehicle construction and maintenance) are a major source of employment.

[10] "Many cities have imposed constraints on non-motorized modes of travel, particularly cycle rickshaws, claiming these cause congestion or unfairly exploit human labour, or that they represent backwardness. Far more degraded labour conditions are sadly overlooked by these same authorities when hidden behind factory gates and in garbage dumps. The suppression of cycle rickshaws is comparable to the removal of slums and squatter settlements. Just as slum clearances destroy real housing resources for the poor, cycle rickshaw bans eliminate real transportation resources for the poor, hurting hundreds of thousands of people who frequently lack the political power to defend their mobility systems and jobs." (cited by Godard, 1994, taken from M.A. Replogle *Bicycles and cycle rickshaws in Asian cities: issues and strategies*.