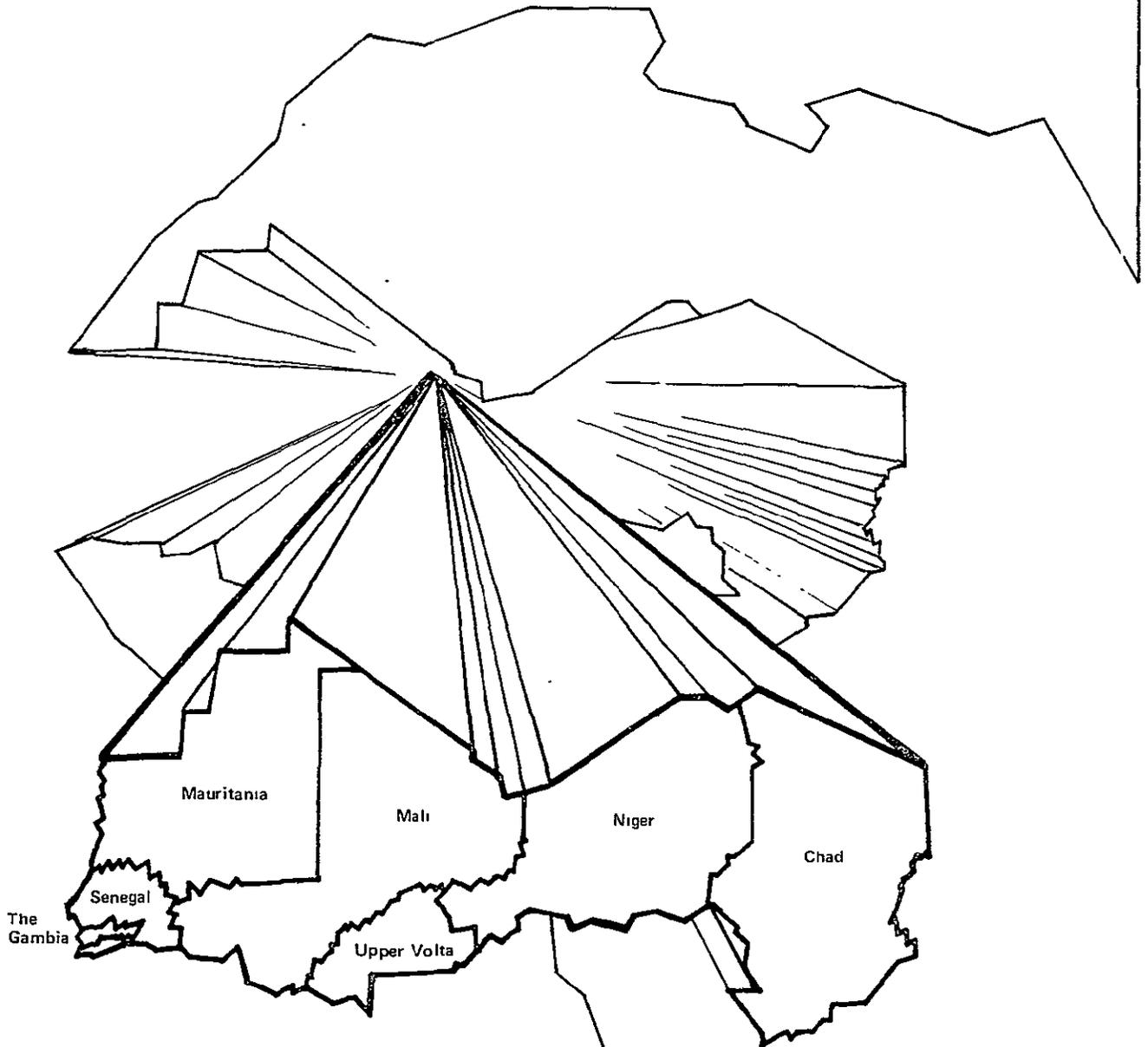


A Sahel Transportation Survey

A Regional Profile



April 1979

Office of Foreign Disaster Assistance
Agency for International Development
Washington, D.C. 20523

A SAHEL TRANSPORTATION SURVEY

A Regional Profile

prepared for

The Office of U. S. Foreign Disaster Assistance
Bureau for Private and Development Cooperation
Agency for International Development
Department of State
Washington, D. C. 20523

by

Evaluation Technologies, Inc.
Arlington, Virginia
under contract AID-otr-C-1553

This Sahel Transportation Survey is designed as a supplement to the series of country profiles developed in support of the planning, analysis and relief operations of the Office of U.S. Foreign Disaster Assistance (OFDA). Though primarily derived from recent CILSS, AID, DOT and World Bank data sources, it also incorporates data from the OFDA Country Profiles of the Sahelian states. Content, scope and sources are still in the process of evolving and will be revised as more complete data on this changing region become available.

We invite your comments and corrections. Address these and other queries to OFDA, AID, as given above.

April 1979

OFDA COUNTRY PROFILES: APRIL 1981

AFRICA

Cape Verde
Chad
Djibouti
East Africa Regional Profile
Ethiopia
Mali
Mauritania
Niger
Sahel Transportation Survey
Senegal
Somalia
Uganda
Upper Volta
Zaire

ASIA

Bangladesh
Burma
India
Indonesia
Malaysia
Nepal
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Philippines

CARIBBEAN

CARICOM Regional Profile
Dominican Republic
Haiti

LATIN AMERICA

Bolivia
Chile
Ecuador
El Salvador
Guatemala
Honduras
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NEAR EAST

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TO:

COUNTRY PROFILE USER Dear _____

Please use this form to note any changes, additions, corrections or suggestions you think would update and improve this country profile. Since our aim is to make these profiles as relevant as possible, your critique is essential and very much wanted. Return comments to Lucy Drobot, OFDA Country Profiles, Room 1262A.

NAME/OFFICE: _____ PHONE: _____ Date: _____

TOPIC

COMMENTS

TOPIC	COMMENTS

Introduction

The information contained in this survey has been abstracted from the following two studies: 1) The Role of AID in the Development of Sahel Transportation Infrastructure, a preliminary draft report by the US Department of Transportation dated September 1978. 2) Road Maintenance Diagnostic Study for the Sahel, commissioned by the Permanent Interstate Committee for Drought Relief in the Sahel (CILSS), and Club du Sahel, sponsored by AID, and carried out by Louis Berger International, Inc., dated July 1977.

Both studies were commissioned not only to examine the vital role of transportation in the Sahel but to assess the serious and chronic transport problems such as continued road deterioration and high transport costs that plague all Sahelian countries. The general conclusions of both groups about Sahel transportation are less pertinent to this survey than the specific findings and constraints of each study. The latter have been summarized below.

Berger Study

Despite expansion of transport activity since the 1972 drought, 4 major reasons exist for serious road deterioration and high transport costs in all Sahel countries: 1) Severe limitations on local and foreign resources allocated to road maintenance. In real terms, budgetary resources have stagnated since 1972 and, in some cases, were significantly lower; as operating budgets decline, personnel costs consume a greater share of outlays to the detriment of other priority areas (fuel, spare parts, materials, etc.) resulting in a sharp decline in human and equipment productivity. 2) Misplaced emphasis on construction rather than maintenance. 3) Lack of qualified personnel. 4) Lack of management systems. An additional reason mentioned is the enormous pressure exerted on understaffed, underfinanced, and underequipped maintenance organizations to assume greater responsibility beyond their present means, resulting in extremely low morale/incentive levels for all personnel and maintenance officials.

The Berger Study also emphasized two major constraints to its survey:

- a) data availability and quality -- study was restricted to existing secondary sources (except for personal interviews) and was hampered by all of the following: lack of information on road network; rehabilitation/maintenance operations poorly

documented; unit cost data varied widely; extremely inadequate economic analysis; equipment/workshop data varied in quality and extent; extreme difficulty in evaluating allocation of financial resources.

- b) time availability -- only six months to produce a draft of the Final Report, and less than two months to prepare an interim report.

DOT Study

A sector by sector assessment:

- Roads: in terms of tonnages and passengers moved, road transport is the dominant mode in the Sahel. However, the 80,000 km of roads and tracks are largely deteriorated while road maintenance remains an acute problem.
- Railroads: a total of 2,800 km of principal railroad lines. Of the eight Sahel countries, only Mali, Mauritania, Senegal, and Upper Volta have railroads. Reliance on truck connections with railways of other countries is important in Upper Volta, Chad, and Niger.
- Waterways: approximately 2,500 km of navigable waterways; populations and farming activity tend to be concentrated near rivers. Presently, freight and passenger traffic by inland waterways extremely limited, although potentially a major transport mode.
- Aviation: in terms of passenger and cargo movement, aviation the least important transport mode in the Sahel; 21 commercial aircraft and 118 airfields operative in domestic feeder activities.

DOT also emphasized two major constraints to its survey:

- a) report is a "best effort" in a 6-week search and review of documents and literature available in the US.
- b) limited time to prepare report precluded official DOT clearance; study is a preliminary draft working paper without DOT endorsement.

Road Network of the Sahel Region: 1978
(In Km)

	<u>Cape Verde</u>	<u>Chad</u>
Paved Road	---	253
Gravel Road	313	671
	(cobbled)	
Earth Road All-Weather	162	374
Earth Road Dry-Weather	---	620
Tracks	283	5,351
Total	758	*7,269
Percent of Total	1%	9%
Km of Road Per 100 sq km	19	2.4
	<u>Gambia</u>	<u>Mali</u>
Paved Road	304	1,663
Gravel Road	528	---
Earth Road All-Weather	1,696	1,704
	(Feeder)	
Earth Road Dry-Weather	432	3,101
Tracks	---	7,577
Total	2,960	14,045
Percent of Total	3%	17%
Km of Road Per 100 sq km	26	1
	<u>Mauritania</u>	<u>Niger</u>
Paved Road	615	1,761
Gravel Road	---	---
Earth Road All-Weather	433	2,140
Earth Road Dry-Weather	2,066	821
Tracks	3,976	13,655
Total	7,090	18,377
Percent of Total	8%	23%
Km of Road Per 100 sq km	1.5	7

	<u>Senegal</u>	<u>Upper Volta</u>
Paved Road	2,536	857
Gravel Road	---	---
Earth Road All-Weather	426	1,205
Earth Road Dry-Weather	5,023	2,864
Tracks	5,265	11,536
Total	13,250	16,462
Percent of Total	16%	20%
Km of Road Per 100 sq km	7	6

All Sahel Countries
(In Km)

Paved Road	8,546
Gravel Road	1,199
Earth Road All-Weather	7,978
Earth Road Dry-Weather	14,927
Tracks	47,360
Total	80,010

* There is an additional 24,000 km of non-classified, non-maintained tracks.

Sahel Road Maintenance/Construction
Some Salient Factors -- 1978

Cape Verde

Heaviest Rainfall:	July-October
Availability of Un- skilled Labor:	Unskilled labor available
Government Capabilities:	Lack of spare parts for equipment.
Private Contractors:	No contractors in country

Chad

Heaviest Rainfall:	June-October
Minimum Wage Rates:	Non-agr., 21.00 CFA (1968); agr., 18.50 CFA (1968)
Problems:	Limited budget; low morale and poor training.

Gambia (See Senegal)

Mali

Heaviest Rainfall:	Rainy season 4-5 months, June-Sept.
Government Capabilities:	Lack of spare parts for equipment.
Private Contractors:	Usually for new construction.
Problems:	Inadequate maintenance budgets: underutilized equipment and staff; inappropriate maintenance policies.

Mauritania

Heaviest Rainfall:	June-September.
Availability of Un- skilled Labor:	High illiteracy rate among mainte- nance personnel. Trained person- nel leave.
Government Capabilities:	Equipment utilization is very low. Does not measure truck weights. Weak organization and management. Poor equipment.
Minimum Wage Rates:	Non-agr., 37.00 CFA (1969); agr., 35.00 CFA (1969).

Niger

Heaviest Rainfall:	June-September
Government Capabilities:	Centralized supply too concentra- ted. Insufficient 2nd workshops.
Problems:	Lack of and poor condition of equipment. Also lack of funds, skill training, mechanics, and spare parts.

Senegal

Heaviest Rainfall:	3-5 month wet season, June-October.
Government Capabilities:	Not enough maintenance; personnel need training.
Private Contractors:	Private contractors do 43% of main- tenance.
Minimum Wage Rates:	Non-agr. 50.60 CFA; agr. 43.85 CFA.

Upper Volta

Heaviest Rainfall: July-October
 Government Capabilities: Financial limitations. Lack of qualified personnel. Tool and equipment shortage.
 Minimum Wage Rates: Non-agr., 23 CFA; agr., 27.00 CFA.

Selected Data for Sahelian Railroads

	<u>Mali</u>	<u>Senegal</u>	<u>Ivory Coast/ Upper Volta</u>	<u>Cameroon</u>
Freight:				
Tons (thousands)	356	1,886	717	1,100
Ton-km (millions)	156	359	442	326
Passengers:				
Number (thousands)	492	1,882	3,006	1,725
Pass.-km (millions)	103	193	945	193
Physical Characteristics:				
Km of Track	642	1,034	517	1,133
Mainline Locomotives	17	36	47)	
Shunter Locomotives	8	28	29)	45
Rail Cars (Self-Propelled)	2	11	25	11
Passenger Cars	8	124	137	94
Freight Cars	334	887	1,319	1,416
Personnel:				
Staff	2,052	3,209	4,821	3,699
Ton-km/Staff Person	76,000	112,000	92,000	88,000
Pass.-km/Staff Person	50,000	60,000	196,000	52,000
Staff Efficiency ^{1/}	125,000	165,000	288,000	134,000
Technical Assistants ^{2/}	14	28	71	112
Cost Distribution:				
Staff	33	63	51	46 ^{4/}
Fuel	9	6	8	4/
Other Materials	17	17	15	
Depreciation	18	8	13	21
Other ^{3/}	24	6	14	33
Cost Per Unit Output				
(cents)	2.2	2.8	2.5	2.7

Notes: Freight data for 1975, except Senegal (1974/1975); Cameroon (1972/1973). Passenger data 1975 except Senegal (1974/75); Cameroon 1972/73). Physical Characteristic data as of 1975 except Senegal (1977); Cameroon (1972/73). Personnel data as of 1975, except Cameroon (1972/73). Cost data 1975, except Cameroon (1972/73); Senegal (1974/75).

- 1/ Defined as (Ton-km + Pass.-km) per staff member. (As reported in World Bank Reports).
- 2/ Numbers in Table are percentage of total cost.
- 3/ Unit Output defined as Ton-km + Pass-km.
- 4/ Included in "other costs."

Principal Rail Lines, Sahel Countries

<u>Country</u>	<u>From/To</u>	<u>Length</u> <u>(km)</u>	<u>Principal Commodities</u> <u>in thou. tons</u>	<u>Passenger</u> <u>Data</u>
Mauritania	Nouadhibou/ F'Derik	650	Iron Ore 11.1 tons (74); small amount of freight	Limited amount

Remarks: Iron ore shipments estimated/assumed to equal mine production. Port connection: Nouadhibou.

<u>Country</u>	<u>From/To</u>	<u>Length</u> <u>(km)</u>	<u>Principal Commodities</u> <u>in thou. tons</u>	<u>Passenger</u> <u>Data</u>
Senegal	Dakar/ Kadiri	643	Phosphates 1,196 tons (1975/76)	1,850,000 (1975/76)
	Dakar/St. Louis	262	Mali Exports 97 tons (1975/76)	
	Branch to Linguere	129	Mali Imports 166 tons (1975/76)	
			Groundnuts 105 tons (1975/76) Other: 42 th tons (1975/76)	

Remarks: International passengers from/to Mali double-counted with Mali estimate below. (Links with railway in Mali). Port connection: Dakar.

<u>Country</u>	<u>From/To</u>	<u>Length (km)</u>	<u>Principal Commodities in thou. tons</u>	<u>Passenger Data</u>
Mali	Koulikoro- Bamako/ Kadiri	642	National: Cement 46.4 tons (1975) Other: 49.9 tons Exports: Groundnuts & related prod. 27.4 tons Cola nuts 17.3 tons Other: 33.0 tons Imports: Foodstuffs 65.4 tons Petro. prod. 31.6 tons Salt 24.7 tons Other: 53.2 tons	491,600 (1975)

Remarks: See note for Senegal above. Port connection: Dakar.

<u>Country</u>	<u>From/To</u>	<u>Length (km)</u>	<u>Principal Commodities in thou. tons</u>	<u>Passenger Data</u>
Upper Volta	Ouagadougou/ Ivory Coast Border	517	Southbound: Oil seeds 43.1 tons (1975) Livestock 31.9 tons (1975) Cotton 31.0 tons (1975) Other: 61.3 tons (1975) Northbound: Petroleum products 109.8 tons (1975) Food 91.0 tons Cement 80.1 tons Other: 87.5 tons	Upper Volta 398,000 (1975) Ivory Coast 1,755,000 Inter- state 678,000 (1975)

Remarks: Freight figure is total for Upper Volta and Ivory Coast; one source says Upper Volta Provides 1/4 of traffic. Port connection: Abidjan. Passenger data is for passengers buying tickets at station.

Total length of all Sahel railroad lines: 2853 km.

Sahel
Domestic Feeder Services,
Aircraft and Ground Facilities
(1971)

<u>Country</u>	<u>Transport Aircraft</u>	<u>Passengers/ Year</u>	<u>Ton/km (000's)</u>	<u>Commercially Usable Airfields (1971-72)</u>
Chad	5 (1970)	25,637 (1970) 89,000 (1971) 44,000 (1972) 108,000 (1973)	460 (1969) 7,783 (1971) 8,700 (1972) 4,100 (1973)	32 including 7 principal air-ports and 6 small fields
Mali	4	-	20 (1969)	-
Mauritania	5	-	20 (1969)	22
Niger	2	-	30 (1969) 1,679 (1971) 1,903 (1972) 2,556 (1973)	
Senegal	3	9,000	10 (1969)	17 (13 used regularly)
Upper Volta	2	-	-	47 small air-ports
Totals	21	275,637	27,261	118

Principal Inland Waterways in Sahel Countries

<u>River Name</u>	<u>Countries Affected</u>	<u>Length (km)</u>	<u>Navigation Season</u>	<u>From/To</u>	<u>Notes</u>
Casamance	Senegal	270	Year round	-	-
Chari	Chad	-	August-December	Sarh/N'Djamena	

<u>River Name</u>	<u>Countries</u>		<u>Length</u> (km)	<u>Navigation</u>		<u>Notes</u>
	<u>Afected</u>			<u>Season</u>	<u>From/To</u>	
Gambia	Gambia		288	Full year	Banjul/Busse or Fatato	Distance upriver depends on ship's draft
Logone	Chad		-	August-December	Mondou/N'Djamena	-
Niger	Niger		-	August-April	Gaya/Port Harcourt through Mali	Gaya/Niamey for part of season
			1,782	July-January		
Saloum	Senegal		140	Year-round	-	-
Senegal	Senegal			All Year	dry: Rosso/St. Louis	May be limited
	Mauritania		-	All Year	wet: Kaedi/St. Louis	to small vessels
	Mali		-	All Year	Kayes/St. Louis	-
Total			2,480			

Principal Characteristics of Sahelian Climatic Zones

<u>Climatic Zone</u>	<u>Annual Precipitation</u>	<u>Rainfall Months</u>	<u>Average Daily Temperature</u> (°F)		<u>Natural Vegetation</u>
			<u>Maximum</u>	<u>Minimum</u>	
SAHARA	Less Than 10"	July through August	40	110	Desert; scattered oases; palms and drought-resistant shrubs, grasses

Environmental Handicaps to Economic Development:

Receives only traces of rain during rainy season. Very inhospitable environment. Extreme temperature variations.

SAHARA (continued)

Agricultural Significance
and Potential:

Main products: livestock and oasis crops.
Little agricultural significance and very
poor potential.

Other Comments:

Inhabited primarily by nomads.

<u>Climatic Zone</u>	<u>Annual Precipitation</u>	<u>Rainfall Months</u>	<u>Average Daily Temperature (°F)</u>		<u>Natural Vegetation</u>
			<u>Maximum</u>	<u>Minimum</u>	
SAHEL	10"- 20"	June through September	50	110	Drought-resistant grasses, shrubs, scattered acacia trees, and small areas of woods.

Environmental Handicaps

to Economic Development: Droughts and extreme temperature variations

Agricultural Significance
and Potential:

Main outputs: livestock, subsistence agri-
culture, low-yield cereals. Pastoral opera-
tions are most important economic activity.

Other Comments:

Represents a base for nomadic pastoralists
during rainy season.

<u>Climatic Zone</u>	<u>Annual Precipitation</u>	<u>Rainfall Months</u>	<u>Average Daily Temperature (°F)</u>		<u>Natural Vegetation</u>
			<u>Maximum</u>	<u>Minimum</u>	
SUDAN	20"- 40"	June through October	75	86	Open grassland and scattered trees.

SUDAN (continued)

Environmental Handicaps
to Economic Development: Cycles of drought

Agricultural Significance
and Potential: Can support relatively intense systems of
agriculture. Good pasture land. Millet,
sorghum, cowpeas, cotton, groundnuts grown.
Substantial possibilities for further diver-
sification into other crops such as maize
and soybeans.

Other Comments: Supports the bulk of the population.

<u>Climatic</u> <u>Zone</u>	<u>Annual</u> <u>Precipitation</u>	<u>Rainfall</u> <u>Months</u>	<u>Average Daily</u> <u>Temperature</u> <u>(°F)</u>		<u>Natural</u> <u>Vegetation</u>
			<u>Maximum</u>	<u>Minimum</u>	
GUINEA	40"- 60"	April through October	75	95	Tropical-Sub- Tropical Grasses and Woodlands.

Environmental Handicaps
to Economic Development: Diseases: river-blindness, trypanosomiasis,
malaria, etc. especially in Upper Volta
and Mali. Tropical forest cover.

Agricultural Significance
and Potential: Major part of area is farmland. Cotton,
rice, peanuts, sorghum, millet, grown. Sub-
stantial possibilities for further diversi-
fication into other crops.

Other Comments: Humidity about 80% during rainy season.
WHO launched major river-blindness eradica-
tion program in Upper Volta.

Effects of Agro-Climatic Conditions
On Transport Requirements

<u>Climatic</u> <u>Zone</u>	<u>Daily</u> <u>Temp.</u> <u>Range</u> <u>(°F)</u>		<u>*Rainfall</u>		<u>Vegetation</u>
	<u>Max.</u>	<u>Min.</u>	<u>Annual</u>	<u>Period</u>	
SAHARA	110	40	Less than 254 mm	July- August	General absence; mostly desert, scattered oases with palms and drought-resistant shrubs and grasses

Erosion: Landslides in mountainous areas; wind erosion; drifting and moving sand dunes.

Major Effect On Roads: Water shortage for compaction; sand on roads loose and unstable; excessive engine wear from heat; wood shortage for construction.

Major Effect On Vehicles: Overheating and excessive engine wear from heat.

<u>Climatic</u> <u>Zone</u>	<u>Daily</u> <u>Temp.</u> <u>Range</u> <u>(°F)</u>		<u>*Rainfall</u>		<u>Vegetation</u>
	<u>Max.</u>	<u>Min.</u>	<u>Annual</u>	<u>Period</u>	
SAHEL	100	50	254mm to 508mm	June- October	Drought-resistant grasses, shrubs, scattered acacia trees, and small areas of woods.

Erosion: Some wind erosion.

SAHEL (continued)

Agricultural Output: Millet, cotton, sorghum, cattle, sheep, goats.

Major Effect On Roads: Water shortage for compaction; some sand drifting on roads; loose sand-unstable; water erosion deteriorates roads; wood shortage for construction; poor drainage saturates roads.

Major Effect On Vehicles: Overheating and excessive engine wear from heat; wear and tear on tires and suspension.

<u>Climatic</u> <u>Zone</u>	<u>Daily</u> <u>Temp.</u> <u>Range</u> <u>(°F)</u>		<u>*Rainfall</u>		<u>Vegetation</u>
	<u>Max.</u>	<u>Min.</u>	<u>Annual</u>	<u>Period</u>	
SUDAN	86	75	508mm to 1,016mm	June- October	Open grassland and scattered trees.

Agricultural Output: Millet, sorghum, groundnuts, rice, cotton, cattle, sheep.

Major Effect On Roads: Rainy season causes delays; black clays unstable; high water table; wood shortage for construction; water erosion deteriorates roads; poor drainage saturates roads.

Major Effect On Vehicles: Wear and tear on tires and suspension.

<u>Climatic Zone</u>	<u>Daily Temp. Range (°F)</u>		<u>*Rainfall</u>		<u>Vegetation</u>
	<u>Max.</u>	<u>Min.</u>	<u>Annual</u>	<u>Period</u>	
GUINEA	95	75	over 1,016mm	April-October	Tropical-subtropical grasses and woodland.

Agricultural Output: Millet, sorghum, groundnuts, rice, maize, cotton.

Major Effect On Roads: High water table creates swamps; black clays unstable; rainy season delays; poor drainage saturates roads.

Major Effect On Vehicles: Overheating and excessive engine wear from heat; wear and tear on tires & suspension.

* 1,000mm = 39.4".

Major Freight Transport Modes

<u>Country/Products</u>	<u>From/To</u>	<u>Transport Mode</u>	<u>Special Notes</u>
1. Chad	a) N'Djamena-Maiduguri/ Port Harcourt	Road	48% of total Import/Exports
	b) N'Djamena-Douala (Cameroon)	Road and Rail	Most attractive road route.
	c) Transequatorial Route via Bangui (Central African Empire) Pointe-Noire (Congo)	Road	Declining in importance. Handles only 12% of total freight.

<u>Country/ Products</u>	<u>From/To</u>	<u>Transport Mode</u>	<u>Special Notes</u>
2. Gambia	a) Dakar/Ziguinchor	Trans-Gambia Highway	Plays important role in bringing the imports from Dakar to Casamance River area.
	b) Banjul/Dakar, Banjul/Ziguinchor	Roads	Important for Banjul Port freight movements.
3. Mali Mainly ground-nuts cotton, and all imports	a) Bamako/Dakar (Senegal)	Rail	Carries 70% of total import/export freight. From Bamako, primary roads to Segou and 70% to Mopti.
	b) Bamako/Ouagadougou (Upper Volta)/Abidjan (Ivory Coast)	Paved road network	Carries 30% of total trade.
4. Mauritania All imports and exports	a) Rosso is the main transport trade center between Mauritania's network and Dakar or Nouakchott ports.	Road	All imports and exports.
	b) Nouadhibou/F'Derik	Rail	All iron ore production.
5. Niger	a) Niamey/Gaya Cotounou (Dahomey)	Niamey-Gaya-Parakou (Road)	20% of ground-nut exports.
		Parakou-Cotounou (Rail)	

<u>Country/ Products</u>	<u>From/To</u>	<u>Transport Mode</u>	<u>Special Notes</u>
5. Niger (continued)			
	b) Kano/Lagos	To Kano (Road) From Kano to Lagos (Rail)	80% of groundnuts.
	c) Niamey/Ouagadougou (Upper Volta)/Abidjan	Niamey - (Rail) Ouagadou- gou Abi- djan (Rail)	
6. Senegal			
	a) Dakar/Kidira	Rail	Most of Mali's imports and ex- ports. Also, all the phos- phate production of Senegal.
	b) Dakar/St. Louis		
	c) Branch to Linguere		
7. Upper Volta			
All imports and exports	a) Ouagadougou/Abidjan	Rail	Carries 90% of country's im- ports and ex- ports.
	b) Ouagadougou/Abidjan	Road	Of limited use.
	c) Ouagadougou/*Bobo- Dioulasso/Banfora	Road	Important for accommodating the potential agricultural production in SW Region.

*Main commercial center

CAPE VERDE

Road Network

In 1977 road network totaled 758 km: 41% cobblestone roads (313 km), 21% earth roads (162 km), and 37% ordinary tracks (283 km). All roads limited to three islands with more than half of network on the islands of Sao Antao and Santiago (approx. 250 km each); road widths vary from 3.5 m to 6 m. Traffic flows mostly small since most vehicles located on Santiago island.

1977 Road Network (in km)

<u>Island</u>	<u>Cobblestone roads</u>		<u>Type of Road</u>		<u>Unimproved tracks</u>	<u>Total</u>
	<u>6 m</u>	<u>3.5 m</u>	<u>6 m</u>	<u>3.5 m</u>		
Sao Tiago	157	16	42	8	25	248
Sao Nicolau	--	18	--	11	38	67
Fogo	3	36	23	--	57	119
Sao Vincente	9	6	--	38	--	53
Sao Antao	54	14	--	22	163	253
Sal	<u>--</u>	<u>--</u>	<u>18</u>	<u>--</u>	<u>--</u>	<u>18</u>
Total	223	90	83	79	283	758

Vehicles

As of 1975: 2,699 cars, 1,530 motorcycles, 775 lorries and buses.

Equipment Inventory

<u>1977 Status</u>	<u>New</u>	<u>Good</u>	<u>Fair</u>	<u>Dead-lined</u>	<u>Retired</u>	<u>Total</u>
Bulldozer D-8	2	-	-	1	-	3
Bulldozer D-7	-	-	-	1	-	1
Bulldozer D-6	-	2	-	-	2	4
Loader 941	-	1	4	-	1	6
Loader 933	-	-	-	1	1	2
Mobile Crane	3	-	-	-	-	3
Compressor						
125 CPM	9	1	1	-	7	18
Compressor						
275 CPM	7	7	5	-	2	21
1 Bag Mixer	-	-	7	-	-	7
Steel Roller	-	1	-	-	1	2
Vibrating Roller	1	2	-	-	-	3
Dump and Flat-						
Bed Truck	15	-	19	6	9	49
Jeeps	7	-	10	2	2	21
Total	44	14	46	11	25	140
%	31	10	33	8	18	100

Source: DNOP Records and Condition Reports

Equipment Inventory and Evaluation (1977)

	<u>1977</u>	<u>1978</u>	<u>Available</u>	<u>Total</u>	<u>1981</u>	<u>1982</u>
			<u>1979</u>	<u>1980</u>		
Bulldozer D-8	3	3	3	3	2	2
Bulldozer D-7	1	1	0	0	0	0
Bulldozer D-6	4	2	1	1	1	1
Loader 941	6	3	2	1	1	1
Loader 933	2	1	0	0	0	0
Mobile crane	3	3	3	3	2	2
Compressor						
125 CPM	18	10	8	7	7	7
Compressor						
275 CPM	21	16	14	14	10	8
1 Bag Mixer	7	5	3	2	2	1

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>Available Total</u>		<u>1982</u>
				<u>1980</u>	<u>1981</u>	
Steel Roller	2	1	1	1	1	1
Vibrating Roller	3	2	2	2	1	1
Dump and Flat- Bed Truck	49	29	22	18	15	15
Jeeps	<u>21</u>	<u>14</u>	<u>10</u>	<u>8</u>	<u>7</u>	<u>7</u>
Total	140	90	69	60	49	46

Source: DNOP Records and Condition Reports

Ports

Porto Grande, St. Vincent

Accommodation: The Porto Grande is a spacious and safe harbor. Entrance from N or S. Pilot meets vessel at entrance to harbor. 24 hours' notice of E.T.A. required. R. of T., 1.22 m approx. Normal anchoring berths from 10 to 20 m depth. Cargo worked by ship's gear. Fishing boat and small craft piers available. Mole accommodates four cargo vessels but has no cargo cranes. A harbor installation built by the Government consists of a quay 43 m long with depth alongside of 3.50 to 9.45 m set out from the shore in an east-west direction just south of Pontinha Point. From the end of this quay an outer quay runs in a SW direction, having a length of 310 m with depth alongside of approx. 9.45 m. An inner quay, length 170 m and a depth alongside of 8.84 m, runs parallel to the outer mole. Provisions available with 24 hours notice.

Bunkers: Two oil depots. Fuel oil and diesel oil supplied up to 300 tons/hr.

Shiprepairs: Two slipways owned by Ministerio da Cordenacao Economica, Oficinas Navais de S. Vincente, each having 250 tons capacity.

Towage: During berthing/unberthing of vessels over 500 g.r.t. the use of tugs is compulsory.

Pilotage: Compulsory inwards, optional outwards.

Airport: N.I.A.: Sal Island (16° 40' N; 23° 0' W) about 176 km E.

Local Holiday: St. Vincent's Day, January 22.

Airports

There are four airports, the principal one at Espargos on Sal Island, and four airfields. Domestic flights by the Transportes Aereos de Cabo Verde (TACV) are another means of inter-island transport. The International airport on Sal, renamed Amilcar Cabral International Airport, in 1975 in honor of the assassinated former nationalist leader of the PAIGC, is an important refueling stop on many African flights.

There are plans for establishing a family operated airline with Guinea-Bissau.

Aerodromes

NB: For up-to-date information consult latest issue of weekly International Notams, International Flight Information Manual, and/or ICAO's Air Navigation Plan for appropriate region.

<u>Location</u>	<u>Eleva- tion M/ Temp C</u>	<u>Runway Characteristics</u>				<u>Fuel/ Octane</u>
		<u>NR/Type</u>	<u>Slope %</u>	<u>Aircraft/ Length M</u>	<u>Aircraft/ Strength (1000 kg)</u>	
Sal I/ Amilcar Cabral Reg S						
16° 44' 37"N 22° 57' 01"W	54 27.4	02/20	0.09	3270	A	LCN80h40 100, JA1

Remarks: Alternate Aerodromes: Bissau/Craveiro, Dakar/Yoff, Free-
town/Lungi, Las Palmas/Las Palmas De Gran Canaria.

Aids: ILS, O2I, VOR, LPA02I, LSA20+, LR, LTX, LB, LO, MD, MC,
MT, MTD, MTX, MO. Clearway 02 & 20-300, L6, L7, L9. No
telex.

* Key

INSTR - Instrument Approach Runway
N-INSTR - Non-Instrument Runway

Radio Aids

ILS - Instrument Landing System
DME - Distance Measuring Equipment
VOR - VHF Omni-Directional Range

Lighting Aids

PA - Precision Approach Lighting System
SA - Simple Approach Lighting System
VA - Visual Approach Slope Indicator System
AV - Abbreviated Approach Slope Indicator System
R - Runway Edge, Threshold & Runway End Lighting
C - Runway Center Line Lighting
TD - Runway Touchdown Zone Lighting
TX - Taxiway Lighting
B - Aerodrome or Identification Beacon
O - Obstruction Lighting

Marking Aids

D - Runway Designation Markings
C - Runway Center Line Markings
T - Runway Threshold Markings
TD - Runway Touchdown Markings
S - Runway Sidestripe Markings
FD - Fixed Distance Markings
TX - Taxiway Center Line & Holding Position Markings
O - Obstruction Markings

Additional Lighting

1. Portable Runway Lights (electrical)
2. Boundary Lights
3. Runway Flood Lights
4. Low Intensity Runway Lights
5. Low Intensity Approach Lights
6. High Intensity Runway Lights
7. High Intensity Approach Lights
8. Sequenced Flashing Lights
9. Visual Approach Slope Indicator (VASI)
(an asterisk (*) preceding the element (L*4) indicates lighting available on prior request by phone, telegram, etc.)

Airfields

Sao Vicente, Praia, Sao Nicolau, Boa Vista, Fago and Maio.

Personal Entry Requirements

Passport required. Visa not required for stay of up to 48 hours.

Smallpox vaccination certificate required of travelers 3 months of age and over only from those who within the preceding 14 days have been in Ethiopia.

Cholera certificate required of travelers arriving from infected areas.

Yellow fever vaccination certificate required from travelers one year of age and over except that no certificate is required of those arriving in Boa Vista, Maio, Sal, Santiago, and Sao Vicente.

Aircraft

Private and non-scheduled commercial aircraft overflying or landing for non-commercial purposes need not obtain prior permission; however, a flight plan must be on file and be received by proper authorities at least two hours in advance.

All non-scheduled commercial aircraft, affinity charter, and tour charters with more than 6 passengers or making more than one flight a month and landing for commercial purposes must obtain prior permission at least two working days prior to departure from the Direccao Geral de Aeronautica Civil, CP 118, Praia, Cape Verde Islands (telegraphic address: None/Telex: None). All requests must include (a) name of operator, (b) type of aircraft and registration marks, (c) date and time of arrival and departure, (d) place(s) of embarkation and disembarkation of passengers and cargo, (e) nature of traffic and purpose of flight, (f) name, address and business of charterer, if any.

Aeronautical Information Source: AIP by NOTAM

International NOTAM Office: Dakar-Goooyn

Domestic Air Carriers

Transportes Aereos de Cabo Verde (TACV): Rua da Serpa Pinto, Praia; connects Sao Vicente, Praia, Ilha do Sal, Sao Nicolau, Boa Vista, Fago and Maio; also weekly services to Senegal and Guinea-Bissau; fleet: three BN-2A Islander, two HS-748 Avro and one Twin Otter.

Foreign

The major international civilian airline servicing the RCV, Transportes Aereos Portugueses (TAP), operates flights 2 or 3 times a week from Lisbon to Sal Island and from Bissau, capital of Guinea-Bissau.

Aeroflot calls weekly on the Eurpoe-Africa route, and South African Airways calls at Sal on Europe-South Africa route.

Distances

<u>From</u>	<u>To</u>	<u>Statute Miles</u>
Cape Verde	Azores	1,499
	Cape Town	4,509
	Gibraltar	1,762
	London	2,731
	New York	3,355
	Paris	2,666
	Rome	2,772
	Washington, D.C.	3,486

CHAD

International Transport

Remoteness of urban centers from ocean ports (1,700-3,000 km) results in high transport costs, which in turn inflates prices of imports and most consumer goods. Principal external transport corridors to the sea are: 1) Nigerian route via Maiduguri to Lagos or Port Harcourt, carrying approximately 32% of total freight in 1977. 2) Cameroon route via Ngaoundere to Douala, accounting for 48% of total transport tonnage in 1977 (16% in 1970). 3) Transequatorial route via Bangui and Brazzaville to Pointe Noire, carrying about 12% of freight traffic in 1977 (47% in 1970).

It is estimated that the Cameroon route will continue to attract an even larger share of transit trade, especially with projected increases in Port of Douala capacity and proposed construction of Mondou-Guidjiba road linking southern Chad with trans-Cameroon axis by a more direct route.

Estimated Demand for Freight Transport 1976-77

<u>International Freight</u>			
<u>Transit Route</u>	<u>Imports other than Petroleum (tons)</u>	<u>Exports (tons)</u>	<u>Total Exports & Imports (tons)</u>
Nigeria	15,000	2,000	17,000
Cameroon			
- via N'Gaoundere	50,000	37,000	87,000
- via Benoue & others	36,000	8,000	44,000
CAE	14,000	14,000	28,000
Other Overland Routes	5,500	500	6,000
Subtotal	<u>121,000</u>	<u>61,500^{1/}</u>	<u>182,000</u>
<u>Petroleum Imports (tons)</u>			
Nigeria	65,000		65,000
Other Routes	5,000		5,000
Subtotal	<u>70,000</u>	<u>Total</u>	<u>252,000</u>

<u>Domestic Freight</u>	<u>Tonnage</u>
N'Djamena - East and North	21,000
N'Djamena - South	
- Beer	20,000
- Other Merchandise	20,000
Sarh - Moundou	20,000
Farm to Ginnery Transport of Cotton	145,000
<u>Total</u>	<u>226,000</u>

1/ Cotton exports account for about 54,000 tons

Source: SEDES, "Diagnosticque Sur l'Industrie de Transport Routiere au Tchad", 1977.

. Mission estimates

Principal Road Transport Tariffs*

International Routes

<u>Dry Goods</u>	<u>Tariff Routes</u> <u>CFAF/ton-km</u>		
	<u>Cameroonian</u> <u>(To N'Gaoundere)</u>	<u>Transequatorial</u> ^{1/} <u>(To Bangui)</u>	<u>Nigerian</u> <u>(To Maiduguri)</u>
Sugar	13.5	14.0 - 20.0	31.2
Cotton	17.0	16.53	15.87
Metal Sheets (+7m)	19.0	16.6 - 21.4	38.4
Flour	13.5	12.3 - 15.9	27.4
Cement	13.5	14.1 - 18.2	38.4
Other Merchandise	18.0	14.8 - 19.1	38.4

Fuel Tariff (CFAF/m³ - km)

Nigerian Route

- From Lagos	11.76
- From Kano	13.95
- From Maiduguri	20.00

Transequatorial Route 17.0 - 19.3

Domestic Routes

<u>Item</u>	<u>Tariff (CFAF/ton-km)</u>			<u>Tracks in Sahelian Zone</u>
	<u>Sarh</u>	<u>Moundou</u>	<u>Abeche</u>	
Cement	13.8	13.2	20.6)
Flour	10.8	10.1	17.5) 25 - 46
Metal Sheets	14.7	14.1	23.8)
Other ^{2/} Merchandise	14.7	14.1	19.0)
Fuel ^{2/}	16.1	16.1	20.7	-
Transport ^{3/} for the Army	20	20	30	30 - 66
Transport for Petroleum Exploitation	19.5	19.5	-	55
Beer ^{3/}	-	12.4	-	-

Comparative Road Transport Tariffs in Cameroon

From N'Gaoundere to North Cameroon, Chad, and CAE

<u>Item</u>	<u>Tariff (CFAF/ton-km)</u>
Metal Sheets	25.0
Rice, Flour, Sugar, Malt, Cement	20.0
Fertilizer	19.0
Cotton	20.0
Other Merchandise	24.0

* Excluding 4.4% Taxe de Chiffre d'Affaire

1/ Tariff variable depending upon point of origin or destination in Chad.

2/ Price in CFAF/m³ - km).

3/ Tariffs obtained under special contract.

Source: - Chad, "Decrete No. 327/PR/TPT/DT", December 4, 1974
- SEDES, 1977

Port of Entry/Retail Price in N'Djamena*

<u>Item</u>	<u>CIF Price Port of Entry</u>	<u>Retail Price</u>
<u>Reinforcing Steel</u>		
- Cameroonian Route	70,000	191,174
- Nigerian Route	70,000	186,692
- Transequatorial Route	70,000	199,919
<u>Corrugated Metal Sheets</u>		
- Cameroonian Route	104,800	322,607
- Nigerian Route	104,800	317,301
- Transequatorial Route	104,800	334,107
<u>Tea</u>		
- Cameroonian Route	170,000	504,154
- Nigerian Route	170,000	480,475
- Transequatorial Route	170,000	516,721
<u>Sugar</u>		
- Cameroonian Route	100,000	127,467 ^{1/}
- Nigerian Route	100,000	194,131
- Transequatorial Route	100,000	136,187
<u>Flour</u>		
- Cameroonian Route	68,000	114,565
- Nigerian Route	68,000	109,582
- Transequatorial Route	68,000	115,736
<u>Tires less than 15 kg</u>		
- Cameroonian Route	2,835	6,970

(Douala -N'Djamena by Air)

<u>Light Truck</u>		
- Cameroonian Route	1,138,600	2,245,437
<u>Heavy Trucks - 12t Payload</u>		
- Cameroonian Route	4,290,700	7,812,437

* CFAF/ton in 1974 prices

1/ Wholesale price to factory

Source: SEDES, 1977

Principal External Trade Corridors

<u>Routes</u>	<u>Section</u>	<u>Road</u>	<u>Rail</u>	<u>River</u>	<u>Total Length (km)</u>
<u>1. Nigerian Routes</u>					
a) Lagos (Apapa)- N'Djamena (2,040 km)	Lagos-Maiduguri Maiduguri- N'Djamena	- 250	1,790 -	- -	1,790 250
b) Port Harcourt- N'Djamena (1,690 km)	Port Harcourt- Maiduguri Maiduguri- N'Djamena	- 250	1,445 -	- -	1,445 250

Remarks: 1 road-rail transfer. Average transit time 2-3 weeks^{1/}; all year practicability. No transfer needed for some fuel transport; high risk of loss and breakage; long port delays in Lagos and Port Harcourt; difficult custom procedures; different road regulations; carried about 32% of total estimated freight tonnage in 1977.

<u>Routes</u>	<u>Section</u>	<u>Road</u>	<u>Rail</u>	<u>River</u>	<u>Total Length (km)</u>
<u>2. The Cameroon Routes</u>					
a) Douala- N'Djamena (1,717 km)	Douala- N'Gaoundere N'Gaoundere- N'Djamena	- 785	932 -	- -	932 785
b) Douala-Mondou (1,674 km)	Douala- N'Gaoundere N'Gaoundere- Mondou	- 742	932 -	- -	932 742

Remarks: 1 road-rail transfer. Average transit time 2-3 weeks; all-year practicability. Relatively simple administrative and custom procedures; same monetary zone; comparatively secure and reliable; some problems relative to priority accorded to Chadian goods at Douala; carried approximately 48% of total estimated freight tonnage in 1977.

<u>Routes</u>	<u>Section</u>	<u>Road</u>	<u>Rail</u>	<u>River</u>	<u>Total Length (km)</u>
3. <u>The Transequatorial Routes</u>					
a) Point Noire-Mondou (2,450 km)	Point Noire-Brazzaville	-	515	-	515
	Brazzaville-Bangui	-	-	1,300 ^{2/}	1,300
	Bangui-Moundou	635	-	-	635
b) Point Noire-Sarh (2,450 km)	Point Noire-Brazzaville	-	515	-	515
	Brazzaville-Bangui	-	-	1,300 ^{2/}	1,300
	Bangui-Sarh	635	-	-	635

Remarks: road-river-rail transfer. Average transit time 4-6^{3/} months; 6-8 months practicability. Long transit time with associated risk of loss, wastage and thefts; poor condition of roads in CAE; barges can carry a full load on the Obangui only from August-December, a period when road access to Bangui is in its worst condition; carried about 12% of total estimated freight tonnage in 1977.

<u>Routes</u>	<u>Section</u>	<u>Road</u>	<u>Rail</u>	<u>River</u>	<u>Total Length (km)</u>
4. <u>The Benoue Routes</u>					
a) Burutu-Mondou (1,982 km)	Burutu-Garoua	-	-	1,550	1,550
	Garoua-Mondou	432	-	-	432
b) Burutu-N'Djamena (2,032 km)	Burutu-Garoua	-	-	1,550 ^{4/}	1,550
	Garoua-N'Djamena	482	-	-	482

Remarks: 1 road-river transfer. Average transit time 4-5 weeks; Benoue River navigable 2-3 months. Suitable for bulk commodities; long waiting time at Nigerian ports of Wari and Port Harcourt; carried approximately 6% of estimated freight tonnage in 1977.

<u>Route</u>	<u>Section</u>	<u>Road</u>	<u>Rail</u>	<u>River</u>	<u>Total Length (km)</u>
5. <u>The Sudanese Route</u>					
Abeche-Port					
Sudan	Abeche-Nyala	570	-	-	570
(2,623 km)	Nyala-Port Sudan	-	2,053	-	2,053

Remarks: 1-2 road-rail transfers; all year practicability. Poor condition of road between Abeche and Nyala; relatively inefficient Sudan Railway; carried about 2% of estimated freight tonnage in 1977.

<u>Routes</u>	<u>Section</u>	<u>Road</u>	<u>Rail</u>	<u>River</u>	<u>Total Length (km)</u>
6. <u>The Libyan Route</u>					
N'Djamena-Tripoli	N'Djamena-Tripoli	3,000	-	-	3,000
N'Djamena-Tunis	N'Djamena-Tunis	3,000	-	-	3,000

Remarks: Through difficult and mountaneous terrain; politically troubled area.

- 1/ Does not account for excessive port delays
- 2/ Via Obangui River
- 3/ As a result of storage of goods in Bangui during the dry season, when river navigation is not possible.
- 4/ Via Benoue River

Source: Bank mission

Road Network

Roads are the dominant mode of transport in Chad accounting for 85% of total freight traffic or 75 million ton-kms. All-weather road construction began in 1964 with an east-west trunk road from Sarh to

Pala, followed by the paving of N'Djamena-Guelendeng and N'Djamena-Massaguet roads; no extensions or major improvements to road system since 1972. In 1977, classified national and prefectural road network totaled 7,269 km: 4,600 km of former, 2,700 km of latter. 253 km are paved, and approx. 1,050 km are all-weather engineered, gravel roads. Road network supplemented by 24,000 km of unmaintained tracks, most of which are passable only 7-8 months of dry season. Major portion of total network located in southern cotton zone which covers 10% of country; sparsely populated north served by desert tracks.

Traffic levels on classified network, except for road between N'Djamena and Guelendeng, less than 100 vehicles/day, mostly trucks; range is from 30-60 vehicles/day on national roads to fewer than 10/day on prefectural roads.

Road network said to be inadequate regarding basic standards and frequency of repair. Agriculturally productive south cut off from N'Djamena and north 3-4 months a year. Lack of funds and a trained workforce results in minimal maintenance and still further deterioration; regular or partial maintenance carried out on 3,343 km (46%) of network.

<u>Road Link</u>	<u>Length</u> (km)	<u>Vehicles/Day</u> ¹		<u>Subdivision</u>
		<u>1970</u>	<u>1978*</u>	
<u>All-Weather Engineered Roads</u>				
<u>Paved</u>				
N'Djamena-Guelendeng	157	108	117	N'Djamena North
N'Djamena-Massaguet	85	48	52	N'Djamena North
Mondou-Koutou	11	-	100	Mondou
<u>Unpaved (Laterite)</u>				
Niellim-Guere	80	16	17	Sarh
Guere-Doba	164	40	50	Sarh
Maindou-La Sido	86	12	9	Sarh
Pala-Kelo	107	39	55	Mondou
Kelo-Mondou	104	38	49	Mondou
Mondou-Baikoro	20	45	56	Mondou
Baikoro-Gore-CAE	110	17	16	Mondou

<u>Road Link</u>	<u>Length</u> <u>(km)</u>	<u>Vehicles/Day</u>		<u>Subdivision</u>
		<u>1970</u>	<u>1978*</u>	
<u>Unpaved (Earth)</u>				
Massaguet-Karme	53	12	13	N'Djamena
Massaguet-Massakory ^{2/}	68	27	30	N'Djamena
Massakory-Bir Garat ^{2/}	38	10	10	N'Djamena
Chagoua-Linia	30	60	65	N'Djamena
Guere-Sarh	27	56	63	Sarh
Sarh-Maindou	36	32	31	Sarh
Pala-Lere-Cameroon	122	7	19	Mondou
 <u>Partially Improved Roads</u>				
<u>Unpaved (Laterite)</u>				
Baikoro-Doba	79	37	47	Mondou
<u>Unpaved (Earth)</u>				
Guelendeng-Bongor	83	25	30	N'Djamena South
Abeche-Biltine	92	7	8	Abeche
Abeche-Adre	167	8	10	Abeche
Mogo-Miltou-Niellim	150	16	17	Sarh
Magou-Lai	49	30	34	Mondou
 <u>Earth Tracks</u>				
<u>Major</u>				
Karme-N'Goura	72	12	13	N'Djamena North
Bongor-Magou	99	30	34	N'Djamena South
Guelendeng-Mogo	149	12	13	N'Djamena South
Guidari-Koumra	116	14	16	Sarh
Koumra-Moissala	74	13	14	Sarh
Lai-Doba	108	16	18	Mondou
Doba-Gore	95	14	10	Mondou
Lai-Guidari	44	14	16	Mondou
Mondou-Baibokoum-CAE	152	18	14	Mondou
Lai-Kelo	60	21	24	Mondou
Koutou-Bere	91	23	26	Mondou
Kelo-Gounou-Gaya	52	-	15	Mondou
Sarh-Kyabe ^{2/}	98	10	10	Sarh
Ati--N'Goura ^{2/}	233	11	10	Mongo

<u>Road Link</u>	<u>Length</u> <u>(km)</u>	
<u>Earth Tracks (cont'd)</u>		
<u>Minor</u>		
Djermaya-Djimtilo	82	
Goura-Bitkine	244	
Bir Garat-Moussoro ^{2/}	96	
Linia-Massenya	127	
Ati-Oumhadjer	165	
Oumhadjer-Abeche	146	
Ati-Mongo	154	
Bitkine-Mongo	59	
Mongo-Mangalme	118	
Melfie-Bitkine	118	Estimated Traffic, 1978
Oumhadjer-Mangalme	110	
Mangalme-Aboudeia	123	Under 10 vpd.
Kyabe-Am Timan	259	
Am Timan-Aboudeia	135	
Moissala-Kendere	125	
Gounou Gaya-Tikem	58	
Pala-Fianga-Cameroon	83	
Oulibangala-Pandzangue	15	
Pala-Gagal Beinamar	121	
Beinamar-Koutou	90	
Ati-Ifenat ^{2/}	63	
Dankala-Yao ^{2/}	39	
Bir Garat-Moussoro ^{2/}	96	
Melfi-Dik	149	

* Projected

1/ Traffic projections are based on: (i) from 1970-74, no traffic growth; (ii) from 1975-78: (a) 3% traffic growth per annum in Cotton Zone; (b) 1% traffic growth per annum in Sahel Zone; and (c) 2% traffic growth per annum around N'Djamena; and (iii) a diversion of 35-40,000 tons of international traffic from Trans-equatorial to Cameroonian route between 1970-74.

2/ To be improved and maintained under UNSO Road Rehabilitation Program.

Source: Mission estimates

Vehicles

As of 1973: 5,770 cars, 6,284 commercial vehicles.

Maintenance

Department of Public Works responsible for all maintenance. Organized into 2 territorial arrondissements, N'Djamena and Sarh, with each directing a section of network, and 4 common maintenance sub-divisions: N'Djamena, Sarh, Abeche, and Mondou.

Equipment

288 maintenance equipment units: 24% over 9 yrs. old, poorly cared for, and under-utilized. Maintenance on equipment seldom timely.

International Transit Agreements

- With Cameroon: 65% of freight tonnage moved between N'Gaoundere and Chad to Chadian transporters, and 35% to Cameroonian trucks.
- With Nigeria: although obsolete, governs allocation of freight between Chadian and Nigerian transporters from Maiduguri to Chad as follows: 1) General merchandise: 85% of tonnage to Chadian transporters, 15% to Nigerians. 2) Fuel: 15% of tonnage to Chadian transporters, 85% to Nigerians.
- With CAE: no formal agreement, although cotton exports and 85% of other goods handled by Chadian transporters.

Transport Projects

In addition to 4-year maintenance program for 5,300 km of unpaved roads and tracks, construction of 4 new ferryboats at key portage areas now underway. Projects also include training DPW personnel and completion of maintenance/improvement of cotton area feeder roads. See Inland Transport and Waterways.

Inland Transport and Waterways

Waterways only account for 5% of transport activity. River Chari is navigable between N'Djamena and Lake Chad year round, and between N'Djamena and Sarh (850 km) from mid-August to mid-December. The Logone River is navigable between N'Djamena and Mondou (1,000 km) from September to late October. Barge traffic on the rivers and Lake Chad is estimated at about 15-20,000 tons per year, or about 10-15 million tons-km. Major commodities include beer, timber, sugar, steel, fuel, natron and fish. Prospects for river transport development are limited because of river regime constraints, although the outlook for developing barge transport on Lake Chad is more favorable. See Introduction and Port Harcourt/Nigeria, Port Douala/Cameroon in Annex 1.

Bongor Ferry

Situated 240 km upstream from N'Djamena on the Logone River; serves to connect Bongor with the international routes in Cameroon. It also provides the only direct link between Bongor, the prefecture headquarters, and parts of Mayo Kebbi prefecture across the Logone. Although existing ferry has a payload capacity of 25 t, its deck cannot accommodate truck-trailer units. With new ferry, cotton export traffic originating in Onoko and Bongor, and destined to N'Gaoundere or Garoua would travel via Fianga and Lere rather than via Lai, Kelo and Lere. 50% of cotton transport demand generated by the ginneries at Fianga, Pala and Gounou Gaya would be serviced by trucks on the return haul from N'Djamena via Bongor rather than via Lai. With complete disruption of existing ferry service expected in five years, about 1/2 of the light and medium truck traffic would be obliged to travel an extra 100 km on every trip from Bongor to the left bank of Logone.

Lai Ferry

Situated on the Logone, 390 kilometers upstream from N'Djamena; cannot now handle heavy traffic between Mondou and N'Djamena. A larger ferry would reduce the distance between N'Djamena and Mondou, by 93 km for transport of fuel, beverages and other general merchandise using heavy trucks. Additional benefits would accrue to transport of seed cotton from the right bank of Logone to the ginnery at Kelo, which has excess capacity. The external transport of cotton ginned at Guidari would gain from vehicle operating cost savings resulting from a distance reduction of 147 km.

Bouso Ferry

Located 300 km downstream from N'Djamena on the Chari River, it connects Bouso, a market town and the administrative center of the Bouso sub-prefecture, located on the right bank of Chari with the main N'Djamena-Sarh route. The ferry is indispensable to the operation of the ginnery in Bouso, as about 60% of seed cotton ginned here comes from the left bank. Since the ferry cannot accommodate truck-trailers, baled cotton is first ferried across the river in small trucks to Mogo where it is transferred to larger trucks for export. If the ferry service were to terminate, Bouso would be effectively isolated, its only outside link being to Massenya via tracks that are virtually impassable.

Hellibongo Ferry

Serves as the southern gateway to the Sahel zone. Of all the ferries, Hellibongo has the greatest impact on the economy of the region it serves. Loss of ferry service at Hellibongo would result in closure of cotton ginneries in Kyabe and Am Timan, return to subsistence farming on land used for growing cotton on the right bank of Chari near Sarh, and permanent disruption of the only viable transport link between Sarh and the Sahelian prefectures of Guera, Ouaddai and Salamat. The ferry is also vital to petroleum and mineral exploration in north Chad; in fact, the ferry was partially renovated recently with assistance from petroleum exploration companies.

Air Transport

44 airfields and airstrips, including one international airport at N'Djamena for commercial jets. Most airstrips unpaved; lack of adequate maintenance has impaired serviceability, although six airstrips now being restored. Total air freight traffic in 1975: 14,500 tons, 29,000 tons in 1970. Major air-exported commodities: meat, fish and gum arabic. Domestic transport handled by Air Tchad; domestic demand for air transport seasonal, peaking in August or September (rainy season) when road transport is difficult or impossible. Substantial increase in air transport unlikely in near future.

As of 1971, only N'Djamena Airport equipped to handle jet traffic; DC-6 prop craft could land at Abeche, Fort Archambault, and Mondou. Airports at Bongor, Largeau, Mongo, and Pala accommodated DC-4's; 24 smaller airstrips could take Douglas DC-3's (Dakotas).

Airports

Inter-African air transport is often less efficient than international, but sometimes only possible mode. Thus, air transport is particularly necessary in regions N and E of N'Djamena where low traffic volumes and great distances do not justify cost of building roads. Unfortunately, most development funds have been used at N'Djamena Airport to detriment of deteriorating secondary airports, which ought to be upgraded to all weather standards, to have extended runways, and updated aeronautical equipment.

Transit center and largest air freight handler in central and western Africa, N'Djamena Airport is only international facility. Other major airports: Sarh, Mondou, Bongor, Abeche. N'Djamena and Sahr are maintained by Asecna, a French managed multinational concern which also operates most important secondary airports. Civil aviation division of ministry of public works maintains secondary airports.

Aerodromes

NB: For up-to-date information consult latest issue of Weekly International Notams, International Flight Information Manual, and/or ICAO's Air Navigation Plan for appropriate region.

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M/</u> <u>Temp C</u>	<u>Runway Characteristics</u>				<u>Aircraft/</u> <u>Strength</u> <u>(1000 kg)</u>	<u>Fuel/</u> <u>Octane</u>
		<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/</u> <u>Length M</u>	<u>CL</u>		
Abeche 13° 51'N 21° 51'E	547	NA	NA	NA	NA	NA	80/87 100/130

Remarks: Longest runway: 5,900' hard-surfaced RS1. Aerodrome of entry during daylight hours with prior notice. Emergency lighting.

Bongor 10° 17'N 12° 23'E	331	NA	NA	NA	NA	NA	None
--------------------------------	-----	----	----	----	----	----	------

Remarks: Longest runway: 5,200'. No facilities or services. Aerodrome of entry during daylight hours with prior notice.

Faya 17° 55'N 19° 07'E	237	NA	NA	NA	NA	NA	None
------------------------------	-----	----	----	----	----	----	------

Remarks: Longest runway: 7,500'; RS1. Aerodrome of entry during daylight hours with prior notice.

Mondou 08° 37'N 16° 04'E	431	NA	NA	NA	NA	NA	100/130
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Remarks: Longest runway: 5,900', hard-surfaced. R62, 2, S1. Aerodrome of entry during daylight hours with prior notice.

N'Djamena/ N'Djamena				DC-8, 63			80/87
12° 07' 30"N	295	05/23	0.036	2800	A	AUW 139	100/130
15° 01' 34"E	35.3	PA-1		2800	B	AUW 200	115/145
							Jet

Remarks: Alternate aerodromes: Bangui/M'Poko, Douala/Douala, Garoua/Garoua, Geneina/Geneina, Kano/Kano; ILS-05-II, VOR, L, PA-05-I, SA-23, VA-23+, LR, LTX, B, O, MD, MC, MT, MTX, MO. Longest runway: 9,200', hard-surfaced; RBL2, 4, S4.

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M/</u> <u>Temp C</u>	<u>Runway Characteristics</u>				<u>Fuel/</u> <u>Octane</u>
		<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/</u> <u>Length M</u>	<u>Aircraft/</u> <u>Strength</u> <u>(1000 kg)</u>	
Pala 09° 23'N 14° 56'E	NA 469	NA	NA	NA	NA	None

Remarks: Longest runway: 5,200'; no facilities or services. Aerodrome of entry during daylight hours with prior notice.

Sarh/ Sarh									
09° 09' 01"N	365	04/32	INSTR	SE 210	0.055	2000	B	AUW 44	80/87
18° 22' 53"E	33.5	04/22				1800	C	SW7 DW 12	100/130

Remarks: Alternate aerodrome: N'Djamena/N'Djamena. SA-22, LR, LTX, LO, MD, MC, MT, MTX, MO.. Longest runway: 5,900', hard-surfaced; R62, 4, S1. Aerodrome of entry with prior notice.

* Key

INSTR - Instrument Approach Runway
N-INSTR - Non-Instrument Runway

Radio Aids

ILS - Instrument Landing System
DME - Distance Measuring Equipment
VOR - VHF Omni-Directional Range

Key (cont'd)

Lighting Aids

- PA - Precision Approach Lighting System
- SA - Simple Approach Lighting System
- VA - Visual Approach Slope Indicator System
- AV - Abbreviated Approach Slope Indicator System
- R - Runway Edge, Threshold & Runway End Lighting
- C - Runway Center Line Lighting
- TD - Runway Touchdown Zone Lighting
- TX - Taxiway Lighting
- B - Aerodrome or Identification Beacon
- O - Obstruction Lighting

Marking Aids

- D - Runway Designation Markings
- C - Runway Center Line Markings
- T - Runway Threshold Markings
- TD - Runway Touchdown Markings
- S - Runway Sidestripe Markings
- FD - Fixed Distance Markings
- TX - Taxiway Center Line & Holding Position Markings
- O - Obstruction Markings

Additional Lighting

1. Portable Runway Lights (electrical)
2. Boundary Lights
3. Runway Flood Lights
4. Low Intensity Runway Lights
5. Low Intensity Approach Lights
6. High Intensity Runway Lights
7. High Intensity Approach Lights
8. Sequenced Flashing Lights
9. Visual Approach Slope Indicator (VASI)
(an asterisk (*) preceding the element (L*4) indicates lighting available on prior request by phone, telegram, etc.)

Personal Entry Requirements

Passport required.

Visa required.

Health: Smallpox vaccination required. Yellow fever vaccination required for individuals 1 year of age and over. Inoculations against cholera, typhus, typhoid and polio recommended. Malaria suppressive also recommended.

Aircraft Entry Requirements

Private and Non-Scheduled Non-Traffic Flights

The Civil Aeronautics Administration of Chad must receive advance notification at least 72 working hours prior to departure of a private or non-scheduled non-traffic flight. The advance notice, written in French, must contain the following information:

Name and address of airline operator; type of aircraft and its registration marks; date and time of departure from airport in question; place or places where cargo is to be taken on or unloaded; purpose of flight; number and nationality of passengers; nature and quantity of freight; surname, given names, and nationality of pilot and crew members; surname, address, and occupation of charterer if applicable.

Non-Scheduled Commercial Flights

Prior permission must be requested from the minister-in-charge of transportation for non-scheduled commercial flights. This request must be written in French and must be received at least 10 days prior to the proposed flight. The request must contain the same information required in the advance notification for private and non-scheduled non-traffic flights.

Airlines

Compagnie Nationale Air-Tchad, N'Djamena; government majority

holding with 36 per cent UTA interest; regular passenger, freight and charter services within Chad; fleet of one DC-4, two DC-3's, one Baron, one Cherokee.

Chad is also served by the following foreign airlines: Cameroon Airlines, Air Afrique, Air Zaire, Sudan Airways and UTA.

Air Distances

N'Djamena to:	In Statute Miles
Bangui	587
Cairo	1,625
Douala	668
Garoua	224
Geneina	508
Kano	440
N'Gaoundere	345
Niamey	870
Pala	190
Pointe Noire	1,190
Port Gentil	965
Rome	2,054
Sarh	307
Tamoua	683
Tripoli	1,423
Tunis	1,732
Yagoua	123
Yaounde	621
Zinder	424

GAMBIA

Road Network

Unofficially divided into principal, secondary, and feeder roads. Principal roads run parallel to north-south banks of Gambia river; secondary roads serve area around capital. As of 1977, no network inventory available detailing road characteristics, actual surface and drainage conditions, or traffic data.

Road Network 1977

<u>Class</u>	<u>Paved road</u>	<u>Gravel road</u>	<u>Earth road all-weather</u>	<u>Earth road dry-weather</u>	<u>Total by Class</u>
Primary roads	277	425	---	174	876
Secondary roads	27	103	---	---	130
Feeder roads	---	---	<u>1,696</u>	<u>258</u>	<u>1,954</u>
Total by type	304	528	1,696	432	2,960
P.W.D. responsibility	304	528	---	---	832
Maintained by P.W.D.	304	528	---	---	832
% of total network	10%	18%	57%	15%	100%

Source: Interviews with P.W.D. officials

Vehicles

As of 1973: 5,831 vehicles but not classified by type.

Maintenance

Responsibility for road maintenance divided between two agencies: Public Works Department within Ministry of Works and Communication is responsible for paved and gravel roads, while Ministry of Local Administration is responsible for remainder of network.

Equipment

65% of repair fleet is over 10 years old. Fleet also originates from 9 different countries, making standardization nearly impossible. Central workshop is in Banjul and a temporary field site is in Bakko near the airport. In addition, a regional workshop is in Mansa-Konko, and 2 small shops are in Georgetown and Basse.

Waterways

Gambia River described as "Africa's only good waterway;" navigable by ocean vessels of draft up to 19 feet as far as 150 miles upstream.

Ports

See Annex 1

Aerodromes

NB: For up-to-date information consult latest issue of weekly International Notams, International Flight Information Manual, and/or ICAO's Air Navigation Plan for Appropriate Region.

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M</u> <u>Temp C</u>	<u>Runway Characteristics</u>				<u>Aircraft/</u> <u>Strength</u> <u>(1000 kg)</u>	<u>Fuel/</u> <u>Octane</u>
		<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/</u> <u>Length M</u>	<u>CL</u>		
Banjul/Yundum 13° 21'N 16° 39'W	29.6 26.2	14/32 PA-I	0.17	2221	B	LCN4oh43	100JA1

Remarks: Alternate Aerodromes: Conakry/Gbessia, Dakar/Yoff, Free-town/Lungi, LVA14/32, LR, LTX. LB, LO, L4, L9, MD, MC, MT, MTX, MO. Stopway 14 & 32-305. No telex.

Personal Entry Requirements

Passport: required

Visa: required for stay of more than 24 hours.

Vaccination: smallpox. Yellow fever and cholera for arrivals from infected areas. Typhoid and paratyphoid recommended by Gambia.

Other: yellow fever vaccination is required upon departure.

Aircraft Entry Requirements

All private and non-scheduled commercial aircraft overflying or landing for commercial or non-commercial purposes must obtain prior permission from the Director of Civil Aviation, Banjul, Gambia (telegraphic address: CIVILAIR BANJUL/TELEX: None) far enough in advance to permit processing and reply. A request must include all details pertinent to the flight and must include provision for prepaid reply. A flight plan must be on file.

MALI

Transport System

Road and railway systems are the principal means of transport in Mali, leading to the two most important import/export shipment points: Dakar, Senegal and Abidjan, Ivory Coast. Railroad from Dakar to Malian capital of Bamako the cheapest route. Alternate routes from Bamako to Abidjan both 1,200 km either by road or by a road/railroad combination. Paved roads lead from Bamako to Bobo-Dioulasso in Upper Volta or to Ouangalodougou in Ivory Coast, and from either point to Abidjan by rail. A longer and more expensive route through port of Lome in Togo is rarely used. See railroad section.

Transport Costs for Mali Export-Import Traffic^{1/}
(in MF/Ton)

<u>Product</u>	<u>Rail</u> <u>Dakar-Bamako</u> <u>Total</u>	<u>Road</u> <u>Abidjan-Bamako</u> <u>Total</u>	<u>Road/Rail</u> <u>Abidjan-Bamako</u> <u>Total</u>
<u>Exports</u>			
Cotton seeds	21,306	24,126	25,077
Cotton fibers & textiles	29,430	38,641 ^{2/}	33,335 ^{2/}
Groundnuts ^{2/}	21,572	23,039 ^{2/}	25,268 ^{2/}
Groundnut oil ^{2/}	15,049	27,791 ^{2/}	32,224 ^{2/}
Groundnut cake ^{2/}	15,994	25,407 ^{2/}	27,378 ^{2/}
Cereals	16,565	22,150	26,719
<u>Imports</u>			
Cement	20,611	35,843	27,824
Fertilizers	20,015	37,549	31,247
Foodstuff (cereals)	17,786	36,999	30,507
Sugar	23,592	36,979	35,941
Petroleum products	15,473	35,817	38,296

- 1/ Actual tariffs outside Mali and marginal costs in Mali. Comparison omits difference in maritime transport rates between the two ports; Abidjan is on average 10% more expensive than Dakar for Mali-bound traffic (no difference for traffic originating in Mali).
- 2/ Transport costs for groundnut products based on actual location of production near Kita. Additional transshipment in Bamako and railway costs from the production area are included in the costs of the Abidjan routes.
- 3/ Charges at Dakar depot and at Abidjan depot.
- 4/ Transshipment at Bobo-Dioulasso in Upper Volta.
- 5/ Bobo-Dioulasso-Bamako rate, as no transshipment facilities for petroleum at Ouangalo.

Source: Mail Railway, Office National des Transports, and Bank estimates.

Road Network

Classified network totals 12,940 km and is divided into national, regional and local roads; excludes 1,105 km of unclassified tracks. Only 12% of existing network is paved with most of these concentrated in the Bamako-Sikasso-Mopti triangle. 54% of remaining network is seasonal (not all-weather) tracks; only 35% of all roads maintained. Average traffic levels vary from less than 10 vehicles per day to more than 1,000 vehicles per day leaving Bamako.

Road Network and Its Traffic 1977 (km)

<u>Classification</u>	<u>Paved road</u>	<u>Ordinary earth road</u>	<u>Improved track</u>	<u>Seasonal track</u>	<u>Total by class</u>
National roads	1,501	1,161	1,076	1,894	5,632
Regional roads	97	543	936	4,019	5,595
Local roads	9	---	40	1,664	1,713
Non-classified tracks	<u>56</u>	<u>---</u>	<u>1,049</u>	<u>---</u>	<u>1,105</u>
Totals by type	1,663	1,704	3,101	7,577	14,045
Government responsibility	1,663	1,704	3,101	7,577	14,045

<u>Classification</u>	<u>Paved road</u>	<u>Ordinary earth road</u>	<u>Improved track</u>	<u>Seasonal track</u>	<u>Total by class</u>
Maintained	1,135	1,413	1,146	1,278	4,972
% of total network	68%	83%	37%	17%	35%
<u>Average daily traffic</u>					
<u>(Veh/d)</u>					
less 10	51	134	1,933	6,176	---
10-30	89	873	1,068	1,325	---
30-60	162	437	30	76	---
60-100	284	138	63	---	---
100-200	582	122	7	---	---
200-400	367	---	---	---	---
more 400	128	---	---	---	---

Source: Ponts et Chaussees B.P.C.

Inventory of Classified Road Network

National Roads

<u>No.</u>	<u>Links</u>	<u>km</u>
1.	Nahe-Kayes-Sandare-Nioro-Mauritania Border	418
2.	Bafoulabe-Djiburo-Kenieba-Guinea Border	184
3.	Bamako-Kafi-Kolokani-Diema-Nioro	432
4.	Taotomo-Mourdish-Goumbou-Nara-Mauritania Border	285
5.	Bamako-Narena-Kouremale	122
6.	Bamako-Fana-Segou-Bla-San-Sevare-Mopti	631
7.	Bamako-Bougouni-Sikasso-Zegoua-Ivory Coast Border	461
8.	Bougouni-Yanfolila-Badogo-Guinea Border	113
9.	Bougouni-Manankoro-Ivory Coast Border	123
10.	Sikasso-Finkolo-Upper Volta Border	44
11.	Sikasso-Koutiala-Upper Volta Border	138
12.	Bla-Koutiala-Upper Volta Border	185
13.	Koutiala-Kimparana-Sienso	125
14.	Kimparana-Koury	78
15.	Sevare-Bandiagara-Bankass-Koro-Upper Volta Border	182
16.	Sevare-Kona-Douentza-Hombori-Gossi-Gao	579
17.	Gao-Labzanga-Niger Border	212
18.	Gao-Bourem-Anefis-Kidal-Tinzaouaten	632
19.	Anefis-Tessalit-Algeria Border	378
20.	Ansongo-Menaka-Anderemboukane	<u>310</u>
		5,632

Source: "Mali Road Maintenance", June 1975 - DTP

Note: Discrepancies were pointed out between administrative and technical classification in DTP report. Administrative classification was used here.

Regional Roads

<u>No.</u>	<u>Links</u>	<u>km</u>
1.	Kayes-Sadiola-Djiburo	187
2.	Kayes-Abourou-Mauritania Border	136
3.	Kayes-Sero-Yelimane	98
4.	Kayes-Diamou-Bafoulabe	130
5.	Dhalaka-Yelimane-Nioro	202
6.	Nioro-Balle-Goumbou	260
7.	Sandare-Lakamane-Djema	135
8.	Bafoulabe-Oussombidiana-Sandare	158
9.	Kenieba-Kourokoto-Kokofata-Kita	180
10.	Kita-Sikaroko-Bakoro-Guinea Border	76
11.	Kita-Toukoto-Sefeto	160
12.	Kita-Didjan-Kourouninkoto-Nioro	264
13.	Kati-Kita	165
14.	Bamako-Koulikoro-Banamba-Bamandyougou	209
15.	Bamako-Kangaba-Banankoro	135
16.	Nara-Sokolo-Niono	150
17.	Banamba-Niono	208
18.	Fanah-Dioila-Massigui	140
19.	Fana-Tamani-Konodimini	112
20.	Dioila-Beleko-Kignan-Sikasso	205
21.	Zantiebougou-Kakole-Ivory Coast Border	145
22.	Badogo-Kalana	33
23.	Segou-Markala-Niono-Niafunke-Goundam	616
24.	Markala-Macina-Tenenkou	170
25.	Tion-Tominian-Benena-Upper Volta Border	46
26.	Somadougou-Bankass	79
27.	Bankass-Diallassagou-Ouenkoro	80
28.	Kona-Korientze	65
29.	Bandiagara-Douentza	125
30.	Douentza-Kanioume-Bambara Maounde-Rharous	315
31.	Dire-Goundam-Tombouctou	132
32.	Tombouctou-Bourem	329
33.	Kidal-Aquelhoc	150
		<u>5,595</u>

Local Roads

<u>No.</u>	<u>Links</u>	<u>km</u>
11.	Nioro-Lakamane	85
12.	Nioro-Dioukoute	85
21.	Tioribougou-Faladie	45
22.	Faladie-Tomoude-Yelikebougou	50
23.	Fana-Nangola	40
24.	Kolokani-Massantola-Sirakorola	66
25.	Banamba-Sirakoba-Kolokani	70
26.	Bamako-Kourouba	90
27.	Koulikoro-Niamina	85
28.	Banamba-Touba-Niamina	60
31.	Sido-Dogo (via Bamako)	75
32.	M'Pesoba-Falo	65
33.	Oulobougou-Diaramana	60
34.	Koutiala-Konsiguella-Kona	103
41.	Kimparana-Pina-Mandiakuy	60
42.	Zambougou-Sanande	23
43.	Konobougou-Baroueli	18
44.	Tigui-Baroueli	20
51.	Miminiama-Tanal	35
52.	Kersani-N'Gouma	30
53.	Boni-Mondoro	72
54.	Bankass-Bai	67
55.	Bandiagara-Borko	75
56.	Embranchement RR 29-Sangha	25
61.	Gossi-Rharous (Gourma)	125
62.	Ansongo-Tessit	85
63.	Gao-Derey-Tillit	90
64.	Tombouctou-Kabara (paved)	1,713

Note: All of following are unverified estimates: 16% of network in good condition, 20% in acceptable condition, 64% in poor condition (no maintenance for several years).

Road Transport Tonnages in 1975

	<u>Length</u> km	* <u>Road Type</u>	<u>Annual Tonnage</u>
<u>National Roads</u>			
1. Nahe - Mauritania	418	B - C - D	17,152
2. Bafoulabe - Guinea	184	A - D	3,200
3. Bamako - Nioro	432	A - B - D	4,300
4. Taotomo - Mauritania	285	C - D	4,018
6. Bamako - Mopti	631	A	80,707
7. Bamako - Ivory Coast	461	A	74,618
10. Sikasso - Upper Volta	44	B	10,860
11. Sikasso - Koutiala	138	B	26,802
13. Koutiala - Sienso	125	A	13,306
15. Sevare - Upper Volta	182	B - C	567
17. Gao - Niger	212	B	2,328
18. Gao - Tinzaouten	632	C - D	6,276
<u>Regional Roads</u>			
1. Kayes - Djiburo	187	B - C	16,870
4. Kayes - Bafoulabe	130	A - D	16,870
8. Bafoulabe - Sandare	158	D	3,200

*Type of road: A = paved road
 B = ordinary earth road
 C = improved track
 D = seasonal track

Source: Rapport Annuel de l'Office National des Transports

Vehicles

As of 1974: 16,344; no classification by type available.

Road Maintenance

Ministry of Transport and Public Works assigns Public Works Department responsibility for maintaining all roads. Work is carried out by subdivisions attached to each Public Works region (arrondissement).

As with all Sahelian countries, Mali's financial resources are too meager to maintain road network at a satisfactory level of service. However, Mali has a relatively high percentage of skilled workers in the Public Works Department but poor management leads to their chronic underutilization.

Equipment

Public Works Department fleet consists of 514 units that are rented out to the subdivisions. It is estimated that 25% of fleet is obsolete but still used due to lack of vehicle repair/replacement funds. Central workshop in Bamako has light and heavy machine tools.

Equipment Fleet

<u>Unit</u>	<u>No.</u>	<u>Type</u>	<u>Age</u>	<u>Start- up Year</u>	<u>Junking Year</u>	<u>Replace- ment</u>
Bulldozer	4	D8H	13	1964	1970	1977
Bulldozer	13	D7F	6	1971	1977	1977
Bulldozer	1	D7G	2	1975	1981	1981
Bulldozer	3	D5	4	1973	1979	1979
Track Loader	2	922B	13	1964	1970	1977
Wheel Loader	13	545	5	1972	1977	1977
Wheel Loader	1	85A	13	1966	1970	1977
Grader	1	N490-440	13	1964	1969	1977
Grader	2	N530	4	1973	1978	1978
Grader	1	N53	3	1974	1979	1979
Grader	3	MG12	16	1961	1967	1977
Grader	7	MG12	15	1962	1968	1977
Grader	3	MG12	13	1964	1970	1977
Hydraulic Crane	2	14C	4	1973	1978	1978
Low-Bed Trailer	4	TLM12	5	1972	1978	1978
Dump Truck 12 cu.m.	5	GBH12	4	1973	1979	1981
Dump Truck 12 cu.m.	12	GBH12	2	1975	1981	1981

<u>Unit</u>	<u>No.</u>	<u>Type</u>	<u>Age</u>	<u>Start- up Year</u>	<u>Junking Year</u>	<u>Replac- ment</u>
Dump Truck 6 cu. m.	10	GLR160	3	1974	1979	1979
Dump Truck 6 cu. m.	49	GLR200	5	1972	1977	1977
Dump Truck 6 cu. m.	10	KB212	2	1975	1980	1980
Dump Truck 4 cu. m.	45	L62	5	1972	1978	1978
Dump Truck 4 cu. m.	4	TE220	2	1975	1980	1980
Mobile Service Unit	2	L64/8	5	1972	1978	1978
Mobile Service Unit	1	L64/8	4	1973	1979	1979
Water Truck 10,000 L	20	GLR200	5	1972	1978	1978
Water Truck 10,000 L	2	GLR200	4	1973	1979	1979
Water Truck 10,000 L	2	GLR200	2	1975	1981	1981
Water Truck 10,000 L	20	SM170	2	1975	1981	1981
Water Truck 10,000 L	5	KB212	2	1975	1981	1981
Water Truck 8,000 L	1	L62	4	1973	1979	1979
Crane	1	GBH12	5	1972	1978	1978
Bituminous		Rinchard				
Spreader	4	ECM	2	1975	1980	1980
Greasing Unit	1	L64/8	4	1973	1979	1979
Wheel Roller	13	P64	5	1972	1978	1978
Steel Roller	8	RN16	5	1972	1978	1978
Vibrating Roller	7	RW6	5	1972	1978	1978
Vibrating Plate	6	BS60Y	3	1974	1980	1980
Self-Propelled		Isocom-				
Compactor	1	pac† B2	4	1973	1979	1979
Self-Propelled		Isocom-				
Compactor	1	pac† PF2	3	1974	1980	1980
Wheel Tractor	13	165-8SM	5	1972	1978	1978
Pav. Repair Unit	6	SM7	3	1974	1980	1980
Gravel Spreader	2	---	5	1972	1978	1978
Towed Bit. Sprayer	3	H300	2	1975	1981	1981
Compressor	7	---	4	1973	1979	1979
Generator	8	W71	5	1972	1978	1978
Generator	1	---	4	1973	1979	1979
Generator	1	---	1	1976	1982	1982
Concrete Mixer	5	B950C	5	1972	1978	1978
Concrete Mixer	2	B940C	6	1971	1977	1977
Concrete Mixer	2	B952C	4	1973	1979	1979
Concrete Mixer	3	B942C	3	1974	1980	1980
Concrete Mixer	1	B930	5	1972	1978	1978
Concrete Mixer	1	43C	6	1971	1977	1977
Concrete Mixer	1	PP43	6	1971	1977	1977
Concrete Mixer	1	CBE44	6	1971	1977	1977
Welding Unit	15	---	6	1971	1977	1977
Water Pump	12	P490	6	1971	1976	1977

<u>Unit</u>	<u>No.</u>	<u>Type</u>	<u>Age</u>	<u>Start- up Year</u>	<u>Junking Year</u>	<u>Replace- ment</u>
Water Pump	1	F110	6	1971	1976	1977
Water Pump	2	LA490	6	1971	1976	1977
Water Pump	1	W239A	6	1971	1976	1977
Water Pump	1	W810	6	1971	1976	1977
Storage Tank	2	DB3	25	1952	----	----
Storage Tank	1	SRP50	5	1972	----	----
Pick-up	10	109	5	1972	1977	1977
Pick-up	14	109	3	1974	1979	1979
Pick-up	2	109	4	1973	1978	1978
Pick-up	3	109	2	1975	1980	1980
Pick-up	1	109	6	1971	1976	1977
Pick-up	2	109	9	1968	1973	1977
Pick-up	2	109	12	1965	1970	1977
Pick-up	2	109	1	1976	1981	1981
Pick-up	4	U10	2	1975	1980	1980
Pick-up	8	U10	3	1974	1979	1979
Pick-up	10	U10	4	1973	1978	1978
Pick-up	5	U10	5	1972	1977	1977
Pick-up	7	U10	6	1971	1976	1977
Pick-up	1	U10	9	1968	1973	1977
Light Vehicle	2	2CV	3	1974	1979	1979
Light Vehicle	4	2CV	5	1972	1977	1977
Light Vehicle	1	2CV	6	1971	1976	1977
Light Vehicle	1	2CV	9	1968	1973	1977
Light Vehicle	1	ID Break	3	1974	1979	1979
Light Vehicle	2	ID Break	9	1968	1973	1977
Light Vehicle (Berline)	1	504	1	1976	1981	1981
Light Vehicle (Berline)	1	504	3	1974	1979	1979
Light Vehicle (Berline)	2	404	5	1972	1977	1977
Light Vehicle (Berline)	2	404	3	1974	1979	1979
Light Vehicle (Berline)	3	404	4	1973	1978	1978
Light Vehicle (Break)	1	304	3	1974	1979	1979
Light Vehicle	4	R4	3	1974	1979	1979
Light Vehicle	5	R4	4	1973	1978	1978
Light Vehicle	1	R12TL	1	1976	1981	1981
Light Vehicle	1	R12TL	4	1973	1978	1978
Light Vehicle	2	R16TL	3	1974	1979	1979

Source: Arrondissement du Materiel

Railroad

Mali's only railroad is 644 km of single track, meter gauge linking Koulikoro and Bamako with the Senegal railway and the port of Dakar. Railway provides the cheapest transport for about 70% of Mali's import/export traffic; also cheapest route for most exports originating at Bamako going west to Senegal, and for all imports destined as far as Segou, 200 km east of Bamako. Condition of railroad is described as adequate. Railroad also provides all domestic passenger transport west of Bamako to Senegalese border and is the only land link to Kayes.

Locomotives and Rolling Stock As of July 1976

<u>Mainline Locomotives</u>					
<u>Manufacturer</u>	<u>Type</u>	<u>Weight (tons)</u>	<u>Power (HP)</u>	<u>Number</u>	<u>Age (years)</u>
Alsthom	BB500 ^{1/}	50	750	2	20
"	BB1150 ^{1/}	64.5	1,050	3	17
"	BB1160	60	1,050	2	11
"	BB1160	60	1,050	4	7
"	BB1170	60	1,050	4	3
General Motors	CC1600	83	1,450	2	3

<u>Shunting Locomotives</u>					
BDR	AA150 ^{1/}	23	150	1	20
CEM	AA400	30	400	1	11
CEM	AA400	30	400	3	10
CEM	AA400	30	400	3	3
Moyse	BB800	66	800	1	1

<u>Railcars</u>					
De Dietrich	ZE120	34	550	2	11
Soule	ZE150	54	850	2	1

<u>Freight Cars</u>	<u>Number</u>	<u>Load Total (tons)</u>	<u>Capacity (m)</u>
Covered Box	235	7,705 tons	
Open Cars	32	1,215 "	
Flat Cars	25	865 "	
Special Cars	7	210 "	
<u>Tank Cars (gasoline)</u>	<u>29</u>	1,100 m ³	
<u>Total</u>	<u>328</u>		

1/ To be scrapped

Source: Mail Railways, July 1976

Waterways

1,650 km of inland waterways in Mali but navigable less than 7 months a year. See Introduction and Abidjan and Lome Ports in Annex 1.

Airports

International airport at Bamako and approximately one dozen other airfields for domestic and commercial services.

<u>Location</u>	<u>Eleva- tion M/ TempC</u>	<u>Runway Characteristics</u>				<u>Aircraft Strength (1000 kg)</u>	<u>Fuel/ Octane</u>
		<u>Slope %</u>	<u>Aircraft/ Length M</u>	<u>CL</u>	<u>NR/Type</u>		
Bamako/ Bamako							80/87 JP1
12° 37' 56"N	33.6	06/24	0.475	NA	NA	AUW	100/130
08° 01' 36"W	1079	INSTR		NA	NA	64	115/145

Remarks: Alternate Aerodromes: Abidjan/Port Bouet, Bobo-Dioulasso/
Bobo Dioulasso, Conakry/Gbessia, Monrovia/Roberts Intl.
Ouagadougou/Ouagadougou. Radio facilities with voice avail-
ability, rotating light, field lighting (runway and ap-
proach), storage, minor aircraft and minor engine repairs.

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M</u> <u>Temp C</u>	<u>Runway Characteristics</u>				<u>Aircraft</u> <u>Strength</u> <u>(1000 kg)</u>	<u>Fuel/</u> <u>Octane</u>
		<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/</u> <u>Length M</u>	<u>CL</u>		
Bamako/ Senou							
12° 32' 22"N	33.4	0725	0.72	NA	NA	AUW	80/87
07° 56' 47"W	1248	PA-1		NA	NA	126	100/130

Remarks: Alternate Aerodromes: Abidjan/Port Bouet, Bobo-Dioulasso/Bobo Dioulasso, Conakry/Gbessia, Monrovia/Roberts/Intl. Ouagadougou/Ouagadougou. Radio facilities with voice availability, rotating light, runway and approach field lighting, storage, minor aircraft and minor engine repairs.

Gao/ Gao							
16° 15'N	37.6	07/25	0.55	NA	NA	AUW	80/87
00° 00'W	869	INSTR		NA	NA	65	

Remarks: Alternate Aerodromes: Bamako/Bamako, Mopti-Barbe/Mopti-Barbe, Tombouctou/Tombouctou. Radio with voice availability; strip lights or portable runway lights.

Kayes/ Kayes							
14° 26'N	36.9	08/26		NA	NA	AUW	80/87
11° 26'W	154	N-INSTR		NA	NA	12	100/130

Remarks: Alternate Aerodromes: Selibabi/Selibabi. Radio with voice availability; strip lights or portable runway lights.

Mopti-Barbe/ Mopti Barbe							
14° 30'N	34.3	06/24	0.188	NA	NA	AUW	80/87
04° 05'W	906	INSTR		NA	NA	65	100/130

Remarks: Alternate Aerodromes: Gao/Gao. Radio with voice availability; strip lights or portable runway lights.

<u>Location</u> <u>Coordinates</u>	<u>Eleva- tion M</u> <u>Temp C</u>	<u>Runway Characteristics</u>				<u>Fuel/ Octane</u>	
		<u>NR/Type</u>	<u>Slope %</u>	<u>Aircraft/ Length M</u>	<u>CL</u>		<u>Aircraft/ Strength (1000 kg)</u>
Nioro/ Nioro							
15° 14'N	37.0	08/26		NA	NA	AUW	NA
09° 35'W	777	N-INSTR		NA	NA	12	NA

Remarks: Alternate Aerodromes: Aioun-El Atrouss/Aioun-El Atrouss.
Runway lighting.

Segou/ 13° 26'N		NA		NA	NA	NA	80/87
06° 17'N	948	NA		NA	NA	NA	100/130 (weight capa- city) DC-4

Remarks: Longest runway: 4,900'. Radio with voice availability,
strip lights or portable runway lights.

Sikasso/ 11° 20' N		NA		NA	NA	NA	None
05° 42' W	1378	NA		NA	NA	NA	(weight capa- city) DC-3

Remarks: Longest runway: 3,900'. No facilities or servicing.

Tombouctou/ Tombouctou							
16° 44'N	37.3	08/26		NA	NA	AUW	NA
03° 00'W	863	N-INSTR		NA	NA	21	NA

* Key

INSTR - Instrument Approach Runway
N-INSTR - Non-Instrument Runway

Radio Aids

- ILS - Instrument Landing System
- DME - Distance Measuring Equipment
- VOR - VHF Omni-Directional Range

Lighting Aids

- PA - Precision Approach Lighting System
- SA - Simple Approach Lighting System
- VA - Visual Approach Slope Indicator System
- AV - Abbreviated Approach Slope Indicator System
- R - Runway Edge, Threshold & Runway End Lighting
- C - Runway Center Line Lighting
- TD - Runway Touchdown Zone Lighting
- TX - Taxiway Lighting
- B - Aerodrome or Identification Beacon
- O - Obstruction Lighting

Marking Aids

- D - Runway Designation Markings
- C - Runway Center Line Markings
- T - Runway Threshold Markings
- TD - Runway Touchdown Markings
- S - Runway Sidestripe Markings
- FD - Fixed Distance Markings
- TX - Taxiway Center Line & Holding Position Markings
- O - Obstruction Markings

Additional Lighting

1. Portable Runway Lights (electrical)
2. Boundary Lights
3. Runway Flood Lights
4. Low Intensity Runway Lights
5. Low Intensity Approach Lights
6. High Intensity Runway Lights
7. High Intensity Approach Lights
8. Sequenced Flashing Lights
9. Visual Approach Slope Indicator (VASI)
(an asterisk (*) preceding the element (*L4) indicates lighting available on prior request by phone, telegram, etc.)

Personal Entry Requirements

Passport: required

Visa: required

Health: smallpox vaccination required. Yellow fever vaccination required but no certificate if arriving from non-infected country and stay less than 2 weeks. Cholera vaccination required if arriving from infected areas.

Aircraft Entry Requirements

Overflight and landing clearance for private and government aircraft must be obtained from the Malian Civil Aviation Authorities (Direction de l'Aviation Civile et Commerciaux, Bamako) through the American Embassy, Bamako. Information required: type of aircraft, registration or call sign of aircraft, nationality of aircraft, name of owner, purpose of flight, dates and hours of arrival and departure of aircraft, complete itinerary of craft, and number of people on board. Also number of crew members, kind and quantity of cargo, addresses of cargo, number of people disembarking on Malian territory, and number of people embarking from Malian territory.

Requests should be made to the embassy at least one week in advance.

Special Notices

Under normal circumstances the maximum total aircraft weight (plane, crew, fuel, etc.) accommodated in Mali (at Bamako) on a regular basis is 71 metric tons. In certain isolated and/or emergency situations planes weighing up to 91 metric tons permitted to land at Bamako.

During the rainy season (June until October) certain restrictions may be placed on the use of airports in Mali.

Air Carriers

Air Mali, BP 27 Bamako. State airline, with daily service to West Africa, weekly service to Paris, and local services. Fleet: one Boeing 727, three DC-3's, one Iliouchine 18, one Antonov 24B, two AN2; 529 employees.

Other

Air Afrique, Air Algerie, Air Guinee, Aeroflot, Interflug and UTA.

Distances In Statute Miles

Interior

Bamako to:

Gao	592	Niafounke	355
Goundam	391	Niono	181
Kayes	261	Nioro	208
Kenieba	217	Segou	129
Mopti-Barbe	294	Tombouctou	439
Nara	188	Yelinane	243

Exterior

Bamako to:

Bobo Dioulasso	269	Kumasi	599
Bouake	393	Lagos	879
Brazzaville	1,078	Lome	774
Conakry	435	Monrovia	475
Cotounou	830	Niaméy	689
Dakar	653	Nouakchott	648
Freetown	447	Ouagadougou	439

Exterior (cont'd)

Bamako to:

Kaedi	441	Roberts Int'l	468
Kankan	177	St. Louis, Senegal	612
Kiffa	355	Tamale	543

MAURITANIA

Road Network

The present road network was officially classified in 1968 and now totals 7,090 km, representing a road density of 5.5 km per 1,000 sq mi, and 5.5 km per 1,000 inhabitants. All roads divided into 3 categories: national roads (4,705 km), regional roads (1,730 km), and secondary roads (655 km).

Traffic levels are generally quite low; 78% of the network has between 5 and 30 vehicles per day. The most heavily traveled roads in 1977 were the paved north-south axes of Akjoujt-Nouakchott (256 km) and Nouakchott-Rosso (204 km); 1972-74 traffic counts for above show 200 vehicles per day on each.

Road Network As of 1977 (In Km)

<u>Classification</u>	<u>Paved</u>	<u>Improved earth</u>	<u>Ordinary earth</u>	<u>Improved track</u>	<u>Existing track</u>	<u>Total by class</u>
National roads	465	433	1,821	945	1,041	4,705
Regional roads	150	-	120	-	1,460	1,730
Secondary roads	-	-	125	140	390	655
Totals by type	615	433	2,066	1,085	2,891	7,090
Govt. resp.	465	[1,341]	[3,279]	5,085
Maintained	465	[994]	[1,070]	2,529
% total network	9%	6%	29%	15%	41%	100%
	9%	[35%]	[56%]	

<u>Average Daily Traffic</u>	<u>(VDP)</u>					<u>% of network</u>
less 10	A	120	1,314	805	2,265	63%
10-30	B		382	210	512	15%
30-60	C	313	155	70		8%
60-100	D	150	215		114	7%
100-200	E					-
200-400	F	459				7%
greater 400	G	6				-

Vehicles

As of 1973: 5,654 cars, 5,590 vans and trucks. In 1974, distribution of vehicles by type showed two different patterns: the most heavily traveled north-south roads carried 70% of all light vehicles and 30% of heavy vehicles (more than 1.5 tons), while the rest of the network carried the opposite percentage.

Maintenance

Road maintenance is the responsibility of the Ministry of Construction which is currently being reorganized into a decentralized organization of 11 territorial sub-divisions.

Forecast Highway Projects 1977-1982

<u>Link</u>	<u>Class.</u> <u>Adm.</u>	<u>Km.</u>	<u>Present</u> <u>Road Type</u>	<u>Final Type</u>
<u>Construction</u>				
Rosso-Boghe	R.N.2	215	R.T.O.	R.B.
Kiffa-Aioun	R.N.2	240	P.A.	R.B.

<u>Link</u>	<u>Class.</u> <u>Adm.</u>	<u>Km</u>	<u>Present</u> <u>Road Type</u>	<u>Final Type</u>
Aioun-Nema	R.N.2	295	P.A.	R.B.
Aleg-Moudjeria	R.N.3	140	P.A.	R.B.
Kangorila-Diouk	N.C.	37	P.O.	R.B.
Atar-Chinghetti	R.R.1	120	R.T.O.	R.B.
Aleg-Boutilimit	R.R.5	114	P.O.	R.B.
Kiouk-Kiffa	R.R.12	163	P.O.	R.B.
Akjoujt-Atar	R.N.1	198	R.T.A.	R.B.
Atar-Choum	R.N.1	118	R.T.O.	R.B.
		<u>1,640</u>		

Rehabilitation

Akjoujt-Atar	R.N.1	45	R.T.O.	R.T.O.
Atar-Choum	R.N.1	118	R.T.O.	R.T.O.
Boghe-Kaedi	R.N.2	100	R.T.O.	R.T.O.
Kaedi-Kiffa	R.N.2	100	R.T.O.	R.T.O.
M'Bout-Selibaby	R.N.5	120	R.T.O.	R.T.O.
Moudjeria-Tidjikja	R.N.3	130	P.A.	P.A.
Kiffa-Tamchakett	R.R.9	120	P.A.	P.A.
Choum-F'Derik	R.N.1	158	P.A.	P.A.
Dakla-Aussert-F'Derik	N.C.	INC.	INC.	INC.
Nouadhibou-Dakla	N.C.	INC.	INC.	INC.
Nouadhibou-Tichla-Aussert	N.C.	<u>INC.</u>	INC.	INC.
		891		

N.C. = non classified
 INC. = unknown
 R.B. = paved
 P.A. = improved track

R.T.A. = improved earth route
 R.T.O. = ordinary earth route
 P.O. = ordinary track

Equipment

Well-equipped central workshop and spare parts warehouse in Nouakchott but service described as only adequate; persistent management problems. Outside of Nouakchott, no other sub-division has a usable workshop.

Fleet Inventory

List and Condition of Present Equipment 1977

<u>Type and Model</u>	<u>No.</u>	<u>Avail- able</u>	<u>Repar- able</u>	<u>Bad</u>	<u>Avail- able</u>	<u>Date of purchase Number/year</u>
Bulldozers D5	7	2	2	3	28%	4/71 - 2/75
Bulldozers D7	3	-	2	1	0%	3/71 - 2/75
Loaders 920	7	2	4	1	28%	5/71 - 2/75
Loaders 955	2	-	2	-	0%	2/71
Grader 120	9	3	3	3	33%	6/71 - 3/75
Hyd. shovel Yumbo	1	-	-	1	0%	1/67
Tractor Ferguson	9	8	1	-	88%	9/71
Roller on tires	3	-	3	-	0%	3/61
Asphalt Patcher L 62	2	2	-	-	100%	2/71
Compactor	2	-	2	-	0%	2/71
Vibrating roller	2	1	1	-	50%	2/75
Compressor	3	-	2	1	0%	3/71
Light vehicles	19	10	5	4	52%	5/69 - 71 14/73 - 75
Land Rover	16	5	2	9	31%	13/71 - 3/75
Dump Trucks GLR 160	19	3	12	4	16%	7/71
Cargo 350-L62	16	5	3	8	31%	16/71
Road Tractor TLM 12	2	2	-	-	100%	2/71
Tanker Trucks GLR 120	7	4	2	1	57%	7/71
Tanker Trucks-Fuel GRH 12	2	2	-	-	100%	2/76
Low Boy	2	2	-	-	100%	2/71
Mobile Workshop L64	3	3	-	-	100%	3/71
Other Light Vehic.	4	1	1	2	25%	4/71
Motorscraper	3	3	-	-	100%	3/76
	<u>143</u>	<u>58</u>	<u>47</u>	<u>38</u>	<u>(40%)</u>	

Traffic

Most passenger traffic occurs in modern sector on Rosso-Nouakchott-Akjoujt road. Goods traffic, other than that generated by mining industry, consists almost entirely of imported foodstuffs and petroleum products entering through Nouakchott and Rosso. Agricultural products and local goods make up only 16% of total traffic.

High freight cost due to long distances traveled; high percentage of one-way freight (return journeys seldom loaded). Cost of fuel, all of which is imported, lack of maintenance facilities for vehicles and high initial cost of vehicles.

GIRM Capacity

As of January 1978, GIRM had 80 10-12 ton Berliet or Mercedes Trucks in working order and another 150-175 scheduled to come into service within 2 years if present rates of maintenance and improvement continue.

FAO estimated (10/77) GIRM vehicle pool's carrying capacity at 2,400 T and private vehicle pool's capacity at 3,600 T per month. Average transport cost per kilo of food estimated at 6-7 UM.

Movement between Dakar and Rosso is still limiting factor on Dakar-Mauritania route.

Seasonal Traffic Flows

In dry season, 25-ton trucks can go at best as far as Nema on sand tracks. In wet season, restricted to paved roads, thus secondary staging point needed at Kiffa to transfer food to 5-10 ton trucks. (Capacity of secondary staging point limited by number of qualified supervisors available).

Surface Miles

St. Louis - Nouakchott	190 mi	(5 hrs)
Rosso - Akjoujt	300 mi	
Nouadhibou - F'Derik and Zouerate	420 mi	(railway)
Rosso - Boghe - Kaedi	300 km	
Nouakchott - Nema	1,000 km	

	<u>Nouakchott</u> <u>km</u>	<u>Rosso</u> <u>km</u>
Atar	475	680
Aleg	454	240
Boghe	429	215
Kaedi	539	325
Kiffa	859	645
Aioun-El-Atrous	1,214	1,000
Nema	1,394	1,180
Nouakchott - Atar	5 hrs by all weather road	
Atar - Chinguetti	3 hrs last of Atar	
Chinguetti - Ouadane	60 miles by track	
Tichitt - Tidjika	125 miles (6 day trek by camel)	

Railways

670 km (419 mi) standard gauge (1,435 mi) single track rail line runs from Port of Nouadhibou stopping at Choum* to iron ore deposits near Zouerate and F'Derik, terminating at Tazadit. Ore shipments constitute bulk of traffic, but small amounts of general merchandise and some passengers are carried on back-haul.

* IDA 3rd hwy project provided for improvement of road linking rail stop at Choum with Atar, the trade center of the north-west, in order to encourage development of general traffic and better connect Nouadhibou with rest of country.

Company

SNIM-COMINOR, Mauritania railway: Nouadhibou: state-owned, responsible for all freight and passenger service on Nouadhibou-F'Derick railway. All motive power is diesel.

Ports

Three ports: Nouakchott and Nouadhibou in Mauritania, and Dakar, Senegal, handle shipping to Mauritania. Nouadhibou, located on western shore of Levrier Bay on north coast, has protected harbor free from siltation, handles iron ore shipping, fishing industry vessels and petroleum imports. Due to low population of hinterland little general cargo passes through Nouadhibou and facilities for handling it are comparatively underutilized.

Less favored by nature, Nouakchott is being developed as major port by GIRM because of role as administrative and refugee resettlement center. Extension of wharf, completion scheduled for late 1977, should enable 5,000 MT cargo ship to dock alongside. In 1976, Nouakchott handled 144,000 MT cargo; in first half of 1977, 134,000 MT. More storage and lighterage were expected by end of 1977. GIRM would like to deemphasize use of Dakar as much as possible.

Dakar

Lat. 14° 40' N; long. 17° 24' W.

General holidays: New Year's Day (January 1)
*El Mauloud, national holiday
Easter Monday
*Labour Day (May 1)
Ascension Day
Whit Monday
Assumption Day (August 15)
*Korite
All Saints' Day (November 1)
*Tabaski
Christmas Day (December 25)

* Labor difficult to obtain

- Currency: franc C.F.A. (Communaute Financiere Africaine)
- Working hours: 08:00 to 12:00; 14:00 to 18:00 hours. Overtime possible on request. Saturday work after noon at overtime rates.
- Documents required: five crew lists of vaccinations, six lists of passengers in transit, six lists of passengers disembarking, four lists of crew's personal effects, four lists of ship's stores, maritime declaration of health, two lists of ports of call, five ships report inwards, harch list.
- Accommodation: a safe harbor formed by two jetties. Water area: 216 hectares. Quays: 7,618 m. Good anchorage for any size vessel. Depth at entrance, 10.36 m (being dredged to 10.97 m); at quays 6.40 to 11.89 m. Wharves and berths as follows--Southern zone: Mole I, 460 m by 150 m; four berths with 10 m water and five with 8 m. Mole II, 290 m by 100 m; five berths with 8.5 m water. Median bank wharf, two berths, one of 10 m depth and one of 6.5 m. Mole III, three berths, length 350 m for large steamers, depth 10 m. Eastern bank wharf, length 200 m, one berth with 10 m water. Northern zone--Mole IV, three berths (length 460 m) with depth of 10 m. Mole IV, two berths, length 180 m, depth 11 m on W side, 8 m on E side. Mole VI; two berths, length 180 m, depth 9 m. North bank wharf, one berth (200 m) depth 8.5 m. Mole VIII (for fuel) 400 m long; Western side--two berths at wharf for colliers and, oil bunkering, depth 10 m. Table and Eastern side--three berths with 10 m depth. One water barge.
- Development: in W zone, a fishing quay is under construction with 1,104 m of berths, draft 7 m, and 370 berths, draft 10 m.
- Shiprepairs: available
- Pilotage: compulsory in and out
- Airport: Aeroport De Dakar, Yoff, 12.8 km transport

Working hours: Monday - Friday, 08:00 - 12:00.
14.00 - 18:00 hrs
Saturday 08:00 - 12:00 hrs

Nouadhibou

Lat. 20° 54' 30" N; long. 17° 03' W. Terminal for iron ore fields at Fort Derick over 300 miles in the interior, to which it is linked by railway.

Accommodation: two berths; 1) depth 7.01 m, length 65 m. 2) Depth 4.88 m, length 55 m. Shed space, 300 sq m; open storage area, 24,000 sq m; lock-up storage, 2,200 sq m; lighters and one tug, 150 h.p. At Point-Central (Mineral Pier). 15 km away from Nouadhibou, maximum depth of water alongside quay, 16 m. 17.5 m in channel. Winds N to NE. Water available.

Development: proposed enlargement of wharf.

Bunkers: bunkers and fresh water available alongside at Nouadhibou.

Shiprepairs: minor repairs

Pilotage: not compulsory except for Mineral Pier

Airport: Nouadhibou, 5 mins by road

Working hours: 08:00 to 12:00, 14:00 to 18:00 hours; 07:00 to 08:00, 12:00 to 14:00. 18:00 to 20:00 hours worked in overtime, with extension to 22:00 to finish a vessel. Saturday, 08:00 to 12:00 with overtime up to 20:00. Overtime can be worked on Sunday from 07:00 to 20:00.

Nouakchott

Lat. 18° 02' N; long. 16° 02' W. Nouakchott wharf is situated about 7 km SSW of Nouakchott.

Accommodation: winds vary from NNW to NE, the predominant wind being NNW, which can affect navigation. Rapid onset of bad weather should be noted. When conditions are bad, vessels should weigh anchor and proceed seaward as the coast offers no natural shelter. At the lighterage, quay depth of water varies between 7 and 8.5 m. The working platform is 86 m by 21 m and lies in a NW/SE direction. It is connected to the shore by a gangway 246 m long and 7 m wide. There is a strong swell January/March and heavy rain July/September.

Working hours: 08:00 to 16:00 hours. Overtime between 16:00 to 19:00 hours.

Shipping Lines

Compagnie Mauritanienne De Navigation Maritime (COMAUNDAM):
BP 587, Nouakchott; national shipping company.

Societe Ouest Africaine D'Enterprises Maritimes (Mauritanie):
BP 351, Nouakchott.

Several shipping companies serve Nouadhibou and Nouakchott, the most important being La Compagnie Paquet and La Compagnie Maurel-Prom.

Airports

Two international airfields, at Nouadhibou and Nouakchott, and 14 smaller airstrips. Only Nouadhibou can handle long-distance jets. Smaller airports, at Aioun, Akjoujt, Atar, F'Derik, Kaedi, Kiffa, and other airstrips can accommodate DC 3 and DC 4 planes for domestic transport.

Aerodromes

NB: For up-to-date information consult latest issue of weekly International Notams, International Flight Information Manual, and/or ICAO's Air Navigation Plan for appropriate region.

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M</u> <u>Temp C</u>	<u>Runway Characteristics</u>			<u>Aircraft/</u> <u>Strength</u> <u>(1000 kg)</u>	<u>Fuel/</u> <u>Octane</u>
		<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/</u> <u>Length M</u>		
Aioun-El-Atrouss/ Aioun-El-Atrouss						
16° 43'N	290	04/22		1590	C	AUW 34 NA
09° 38'W	34.6	N-INSTR	0.30	1590	C	AUW 34 NA

Remarks: Alternate Aerodrome: Bamako/Senou.

Aids: MD, MC, MT, MTX, MO.

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M</u> <u>Temp C</u>	<u>Runway Characteristics</u>			<u>Aircraft/</u> <u>Strength</u> <u>(1000 kg)</u>	<u>Fuel/</u> <u>Octane</u>
		<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/</u> <u>Length M</u>		
Kaedi/ Kaedi						
16° 09'N	25	07/25		2500	B	DC-8 NA
13° 31'W	34	N-INSTR	0.003			Acceptable

Remarks: Alternate Aerodrome: Matam/Oro Sogui.

Aids: MD, MC, MT, MTX, MO.

Nouadhibou/ Nouadhibou						
20° 55' 44"N	5	03/21	0.041	DC-8	A	DC10-30. 100,JA1
17° 02' 01"W	31.6	INSTR		2425		AUW 218

Remarks: Alternate Aerodromes: Conakry/Gbessia, Dakar/Yoff, Las Palmas/Las Palmas De Gran Canaria, Nouakchott/Nouakchott, Sal I/Sal, Villa Cisneros/Villa Cisneros.

Aids: H, ILS 03-1, VOR, LR, LTX, LO, MD, MC, MT, MTD, MTX, MO.

Nouakchott/

Nouakchott

18° 05' 46"N	2	05/23	0	SE 210	SE 210	
15° 57' 06"W	36.8	INSTR		2000	B Acceptable	100,JA1

Remarks: Alternate Aerodromes: Dakar/Yoff, Nouadhibou/Nouadhibou, Saint-Louis/Saint-Louis.

Aids: RL, SA 05, LR, LTX, LO, D, H, MC, MT, MTX, MO.

Selibabi/

Selibabi

15° 11'N	80	07/25	-	DC 3	C	DC 3	NA
12° 12'W	28(EST)	N-INSTR		1220		Acceptable	

Remarks: Alternate Aerodrome: Kayes/Kayes.

Aids: D, MC, MT, MS, MTX. MO planned but not in accordance with ICAO specifications.

* Key

INSTR - Instrument Approach Runway
N-INSTR - Non-Instrument Runway

Radio Aids

ILS - Instrument Landing System
DME - Distance Measuring Equipment
VOR - VHF Omni-Directional Range

Key (cont'd)

Lighting Aids

PA - Precision Approach Lighting System
SA - Simple Approach Lighting System
VA - Visual Approach Slope Indicator System
AV - Abbreviated Approach Slope Indicator System
R - Runway Edge, Threshold & Runway End Lighting
C - Runway Center Line Lighting

Lighting Aids (cont'd)

- TD - Runway Touchdown Zone Lighting
- TX - Taxiway Lighting
- B - Aerodrome or Identification Beacon
- O - Obstruction Lighting

Marking Aids

- D - Runway Designation Markings
- C - Runway Center Line Markings
- T - Runway Threshold Markings
- TD - Runway Touchdown Markings
- S - Runway Sidestripe Markings
- FD - Fixed Distance Markings
- TX - Taxiway Center Line & Holding Position Markings
- O - Obstruction Markings

Additional Lighting:

1. Portable Runway Lights (electrical)
2. Boundary Lights
3. Runway Flood Lights
4. Low Intensity Runway Lights
5. Low Intensity Approach Lights
6. High Intensity Runway Lights
7. High Intensity Approach Lights
8. Sequenced Flashing Lights
9. Visual Approach Slope Indicator (VASI)
(an asterisk (*) preceding the element (L*4) indicates lighting available on prior request by phone, telegram, etc.)

Airfields 2/7

Aioun-El-Atrouss, Akjoujt, Aleg, Atar, Bir-Moghrein, Boghe, F'Derik, Kaedi, Kiffa, M'Bout, Moudjeria, Nema, Nouadhibou, Nouakchott, Rosso, Selibaby, Tamchakett, Tichitt, Tidjikja, Timbedra.

Personal Entry Requirements

Passport and visa required

Smallpox and yellow fever vaccinations except for arrivals from non-infected areas remaining in Mauritania for less than two weeks.

Aircraft Entry Requirements

All private and non-scheduled commercial aircraft overflying or landing for commercial or non-commercial purposes must obtain prior permission from the Director of Civil Aviation, B.P. 91, Nouakchott. Islamic Republic of Mauritania (telegraphic address: MINICOMTRANSPORT Nouakchott/Telex: None) at least 72 hours (7 days for aircraft landing for commercial purposes) prior to departure. All requests must include: name of operator, flight number, if any, type of aircraft, registration marks, date, time and complete route of flight from point of origin, including intermediate stops, fuel type and amount, and other services required: if landing, purpose of flight and number of passengers. All requests must include pre-paid response and certified copies of the requests should be sent to the Dakar Flight Information Center.

Non-scheduled commercial aircraft landing for commercial purposes must also include in the request: purpose of flight, number of passengers, their point of origin, destination and purpose of trip, type, amount, and origin/destination of cargo unloaded/loaded in Mauritania.

All aircraft must have a flight plan on file at least 24 hours prior to departure.

Aircraft arriving from or destined to Israel, Rhodesia or South Africa will be denied permission to overfly or land.

Aeronautical information source: AIP "ASECNA" (France)

International Notam Office: Dakar-Goooyn

Air

Air Mauritanie: B.P. 41, Nouakchott; scheduled domestic passenger and cargo services from Nouakchott and Nouadhibou and International services to Las Palmas, Canary Islands, and Dakar, Senegal; fleet of 2 F.27A, 2 DC-4, 2 DC-3 and 2 Navajo.

Air Afrique: Mauritania has a 7 per cent share in Air Afrique.

Mauritania is also served by the following airlines: Iberia, Royal Air Maroc and Union Des Transports Aeriens (UTA).

Air Distances In Statute Miles

Aloun to:

Dakar	541
Kaedi	264
Kiffa	118
St. Louis, Senegal	146

Akjoujt to:

Dakar	402
Nouadhibou	191
Nouakchott	152
St. Louis	288

Atar to:

Dakar	494
Nouadhibou	259
St. Louis	380

F'Derik to:

Nouadhibou	301
Paris	1,981

Kaedi to:

Kayes, Mali	183
Kiffa	141

Kaedi to:

Nouakchott	268
St. Louis	196

Nouadhibou to:

Nouakchott	208
Paris	2,198
St. Louis	340

Nouakchott to:

Bamako	906	(via Dakar)
Dakar	254	
Marseilles	2,272	(via Pt Etienne and Las Palmas)
New York	4,066	(via Dakar)
Paris	2,419	(via Pt Etienne)

Supplement

Bamako to:

Houston	5,885
Miami	5,556
New Orleans	5,635
Washington	4,667

NIGER

Road Network

Road network revolves around RN1 axis which crosses Niger from east to west. Higher user costs and transport difficulties make Niger one of the most isolated of African countries. In 1977 network totalled 6,923 km of classified roads. A law now under review would classify an additional 22 kms of paved roads, 49 kms of improved earth roads, and 383 kms of ordinary earth roads. Non-classified network consists of 11,000 km of tracks. Density of classified network: 1.67 km per 1,000 inhabitants, 5.4 km. per 1,000 sq km. Density for entire network: 4.39 km per 1,000 inhabitants, 14.3 km per 1,000 sq km.

Condition of Road Network As of 1977*

	<u>Paved road</u>	<u>Improved Earth</u>	<u>Ordinary Earth</u>	<u>Improved Tracks</u>	<u>Ordinary Tracks</u>	<u>Total</u>
<u>Total network</u>	1,761	2,140	821	639	13,016	18,377
4 - Good	1,608	909	65			2,582
3 - Fair	98	869	583	101		1,651
2 - Barely passable	55	362	173	310	22	922
1 - Bad				228	12,994	13,222

*In kilometers

Source: Rapport des TP: Inventaire de l'Etat du Reseau Routier d'Interet General Situation au 1er mars 1977.

Inventory of Road Network As of March 1977+

<u>Origin/End</u>	<u>Sections</u>	<u>Paved</u>		<u>Earth</u>	<u>MT*</u>	<u>NMT**</u>	<u>Total</u>
		<u>2 Lanes</u>	<u>1 Lane</u>				
Niamey (Rond-Point)	Niamey- Tillaberi	115				115	

<u>Origin/End</u>	<u>Sections</u>	<u>2 Lanes</u>	<u>1 Lane</u>	<u>Earth</u>	<u>MT*</u>	<u>NMT**</u>	<u>Total</u>
Pont Kennedy to Mali Border	Tillaberi Mali	115		123 123		123 238	
Niamey (Rond-Point	Niamey-PK 70	17	53				70
Pont Kennedy) to Chad border	PK 70-PK 138		68				68
	PK 138-Dosso	37					37
	PK 175-Bolbol	40					40
	Bolbol-K. Mairoua	40					40
	Mairoua-PK 300	45					45
	PK 300-Doutchi	43					43
	Doutchi-PK 488	145					145
	PK 488-Madaoua	69					69
	Madaoua-Guidam						
	Roumji	44	58				102
	G. Roumji-Maradi		38				38
	Maradi-Tchadaoua	36					36
	Tchadaoua-Aguie	39					39
	Aguie-Tessaoua	32					32
	Tessaoua-Garagoumsa	34					34
	Garagoumsa-Tirmini	4	52				56
	Tirmini-Myrriah	54					54
	Myrriah-Guidimouni	42					42
	Guidimouni-Guidiguir	49					49
	Guidiguir-Goure	21					21
	Goure-Chad	419		+89		35	543
	S/Total	1,209	269	+89		35	1,602
<hr/>							
RN 7 (PK 90) (Sabongari) to RN 1 (PK 208) (Boureimi)				8	101		109
<hr/>							
RN 1-E (PK 179, 4) to RN 1-E (PK 233) (Kore Maroua)	Bolbol-Liddo Liddo-Kore Margua			24		66 54	24 66 90
<hr/>							

Origin/End	Sections	Paved		Earth	MT*	NMT**	Total
		2 Lanes	1 Lane				
RN 1-W (origine RN 1-W) PK 61 to Upper- Volta via (Dori)	RN 1-Tera Tera-Upper Volta			115			115
		2		170		42	172
				1			1

Tera to Foneko				22			22

Niamey 0.		2		118			120
RN 1-E (PK 0, 5) to Haute Volta (vers Fada N'Gourma		2		118			120

Dosso 0. RN 1-E (PK 136, 5) to Dahomey Border	Dosso-PK 98, 8 Pk 98, 8-Dahomey	99					99
			57				57
		99	57				156

Dosso 0. RN 1-E (PK 138) to Dosso RN 7 (PK 0, 6)	Dosso RN 7 (PK 0, 6)						
		1					1

RN 7 (PK 140) to Nigeria Border via Kamba				16			16

RN E (PK 658) (Maradi) to Nigeria (Dji- bia) Border		3	47				50

RN 1-E (PK 659) to RN 9 (PK 0,7)		1					1

Takieta to Nigeria border		3	67				70

Origin/End	Sections	Paved		Earth	MT*	NMT**	Total	
		2 Lanes	1 Lane					
Zinder to O. RN 1-E (PK 894) to Nige- ria Border (Babamutum)	RN 1-Dogo			8		24	32	
	Dogo Bande					40	40	
	Bande-Magaria		22				22	
	Magaria-Timkin		13				13	
	Timkin-Border			6			6	
				41		72	113	

Zinder O. RN 1-E (PK 890, 8) to Algeria Bor- der (in Guez- zam)	PK 0-PK 58 (Aroungouze)	1		57			58	
	PK 58-PK 116 (Guezaoua)			58			58	
	PK 116-PK 174 (Tanout)			58			58	
	PK 174-PK 268 (Takoukou)			72		22	94	
	<u>3-2 Sudivision</u>							
	<u>Agades</u>							
	PK 268-PK 308 (Aderbissinat)			8		32	40	
	P5 308-PK 368 (Abalama)			60			60	
	PK 368-PK 445 (Tigguidin)			77			77	
	PK 445-PK 512 (Assaouas)			67			67	
	Assaouas-Algeria					400	400	
			1		457		454	912

Magaria O. RN 11-S (PK 92, 6) to Nigeria Bor- der (Zango)				61			61	

Timkin O. RN 11-S (PK 107) to Nige- ria Border (Maigatari)	Timkin-Dan Tyao			14			14	
	Dan Tyao Nigeria			62			62	
				76			76	

Dosso O. RN 1-E (PK 138) to Loga	Dosso PK 28, 7			29			29	
	PK 28, 7-PK 43, 6			15			15	
	PK 43, 6 - Loga			30			30	
				74			74	

Origin/End	Sections	Paved		Earth	MT*	NMT**	Total
		2 Lanes	1 Lane				
Illeia to Badeguicheri (RN 29-PK 71)				15			15
Madaoua O. RN 1-E (PK 504, 5) to RN 25 (PK 22)		13		157			170
RN 16 (PK 23) to Taboye (Bretelle)		2		6			8
RN 1-E (PK 535,5) to Nigeria Bor- der via Bangui	RN 1-Bangui Bangui-Border			8	17	2	25
				8	17	2	27
RN 9 (PK 4) to Nigeria Border via Madarounfa		1		30		14	45
Tchadaoua to Mayahi						55	55
Tessaoua O. RN 1-E (PK 777, 5) to Nigeria via Baoudeta- Gabaori						77	77
Agadez O. RN 11-N (PK 445) to Bilma						670	670
RN 25 (PK 52, 2) de Tahoua to Tch Tabaraden				40		55	95

<u>Origin/End</u>	<u>Sections</u>	<u>Paved</u>		<u>Earth</u>	<u>MT*</u>	<u>NMT**</u>	<u>Total</u>
		<u>2 Lanes</u>	<u>1 Lane</u>				
Tabla 0.	Tabla-Loga			31			31
RN 25 (Pk 104) to Dogon-doutchi	Loga-Dogon-doutchi			31		86	86
<hr/>							
Niamey 0.	Niamey-Ouallam	1		98			99
RN 1-W (PK 0, 9) to Mali (Anderanboukane) via Ouallam	Ouallam-Tondikiwindi			19			19
	Tondikiwindi-Mali	1		117		178	296
<hr/>							
Niamey 0.	Niamey-Talcho	2		209			211
NR 1 (PK 1) to Assaouas (RN 1)	Talcho-Tahoua					219	219
	Tahoua-Tablak	2		50			52
	Tablak-Assaouass		4	259	238	70	308
<hr/>							
Filingue to Bretelle de Toukounous				5			5
<hr/>							
Talcho 0.						91	91
FN 25 (PK 210) to Ekrafane							
<hr/>							
Lamorde 0.				145			145
RN 4 (PK 2,4) to Tapoa (W)							
<hr/>							
RN 27 (PK 52, 150) to Say				3			3
<hr/>							
RN 27 (PK 99, 7) to Tamou (Upper Volta) Border)				10			10
<hr/>							
Birni N'Konni							
RN 1-E (PK 417, 3) to Nigeria Border via Sokoto		7					7
<hr/>							

<u>Origin/End</u>	<u>Sections</u>	<u>Paved</u>		<u>Earth</u>	<u>MT*</u>	<u>NMT**</u>	<u>Total</u>
		<u>2 Lanes</u>	<u>1 Lane</u>				
RN 1-E (PK 450, 4) to Tahoua		3		28	86		117
RN 1-E (PK 648, 2) to Dakoro				112			112
Pistes Du Parc Du W				10		167	177
Bretelies Aerodromes		3		4			7
Total National Roads.....		1470	269	2529	482	2173	6923
Total Non-Classified Roads.....		22		432		11000	11454
Total General.....		1761		2931		13655	18377

+ In kilometers

* MT = maintained track

** NMT = non-maintained track

Equipment

Maintenance fleet belongs to Equipment Division of Public Works, Transport and Urban Planning Department (DMTP) which rents to public and private sectors. Present fleet consists of 347 units, 34% of which are immobilized due to obsolescence, inadequate maintenance, or lack of spare parts. Central workshop is in Niamey; subsidiary shops in Konni and Zinder; service stations at Niamey, Dosso, Konni, Maradi, Tahoua, Zinder, Agadez, and Diffa.

DMTP central parts storage is in Niamey, with additional stocks at Konni and Zinder, and in the sub-divisions of Tahoua, Maradi, Agadez, Diffa, and Dosso. Shortage of mechanics and spare parts a chronic problem.

The Equipment Fleet (1977)

<u>Type</u>	<u>Quantity</u>	<u>In Working Condition</u>
Wheel Loader	7	5
Towed Scraper	3	0
Bulldozer 160/180 CV	5	4
Bulldozer 110/120 CV	10	7
Grader	21	19
Broom	42	35
Self-Propelled Pneumatic Roller	2	2
Towed Roller	6	0
Vibrating Roller	5	5
Sheep Foot Roller	1	0
Steel Roller	2	0
Service Truck	4	4
Dump Truck	126	55
Water Truck	5	2
Greasing Unit	5	2
Flat Bed Truck	3	0
Asphalt Repair Truck	3	1
Wheel Tractor	3	2
Four Wheel Drive	1	1
Trailer	11	3
Light Vehicle	82	82

Source: 1) Rapport Inventaire de Materiel au 1er mars 1976.
2) Consultation aupres de Chef de SCR TN.

Vehicles

As of 1973: 13,138 cars and vans, 249 buses and coaches, 2,241 goods vehicles, 476 trailers, 652 non-agricultural tractors, and 766 motorcycles and scooters.

Railroad

Niger does not have a railroad and is therefore heavily dependent on truck transport to railways of other countries. See Introduction

Aerodromes

NB: For up-to-date information consult latest issue of Weekly International Notams, International Flight Information Manual, and/or ICAO's Air Navigation Plan for appropriate region.

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M/</u> <u>Temp C</u>	<u>Nr/Type</u>	<u>Runway Characteristics</u>			<u>Aircraft</u> <u>Strength</u> <u>(1000 kg)</u>	<u>Fuel</u> <u>Octane</u>
			<u>Slope</u> <u>%</u>	<u>Aircraft</u> <u>Length M</u>	<u>CL</u>		
Agadez/ Sud 16° 58'N 07° 59'E	505 41.6	07/25	0.16	1800	C	SW7 DW12 DTW25	100

Remarks: Alternate Aerodromes: Niamey/Niamey, Sebha/Sebha.

Aids: DME, RL, LR, LTX, LO, MD, MT, MS. DC6 acceptable. No tel-ex. Customs available on 12 hours prior notice.

Niamey/ Niamey 13° 28' 53"N 02° 10' 20"E	222 40.5	09/27	0.194	3000	A	SW15 DW23 DTW50	100, JA
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Remarks: Alternate Aerodromes: Abidjan/Port Bouet, Accra/Kotoka Intl, Bobo-Dioulasso/Bobo-Dioulasso, Cotonou/Cadjehoun, Kano/Kano, Lome/Lome, Ouagadougou/Ouagadougou.

Aids: ILS 09-1, VOR, LSA09 and 27, LAV27, LR, LTX, LO, L4, L5, L9, MD, MC, MT, MTD, MS, MTX, MO. Stopway 09 & 27-300. DC10-30 acceptable. No telex.

Zinder 13° 47'N 08° 59'E							100
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Aids: L4. No telex. Customs available on 12 hours prior notice.

Personal Entry Requirements

Passport: required

Visa: required

Vaccination: smallpox. Yellow fever except for individuals arriving from non-infected areas and staying no more than 2 weeks. Yellow fever recommended.

Aircraft Entry Requirements

All private and non-scheduled commercial aircraft overflying or landing for commercial or non-commercial purposes must obtain prior approval from the direction de L'Aeronautique Civile, B.P. 403, Niamey, Niger (telegraphic address: MINITRAVO NIAMEY/Telex: none) at least 4 working days prior to departure. All requests must include (a) type of aircraft and registration marks, (b) name of pilot and number of crew, (c) number of passengers and type and amount of cargo, if landing, (d) route of flight from point of origin to final destination, including intermediate stops, (e) date, time and airport of arrival or entry into the airspace of Niger, (f) purpose of flight.

Commercial flights planning more than 3 flights per month and charter flights remaining in Niger 6 nights or more must submit requests at least 15 days prior to departure.

Special Notices

1. Permission to overfly or to land will be denied to aircraft departing from or destined to either Rhodesia or South Africa.
2. Pilots should carry a copy of the telegraphic request, certified by the telegraphic company to prove that the request was transmitted. Requests for overflight clearance may be considered approved unless denial is received. In all landing cases, however, authorization must be received before arrival.

SENEGAL

Road Network

Several unique features have shaped Senegal's overall transportation system: 1) economic activity and population concentrated in Cap Vert peninsula and Groundnut Basin, resulting in short travel distances and a substantial flow of agricultural commodities from rural to urban areas. 2) strategic location of Dakar for international port facility. 3) transportation infrastructure relatively well developed at independence in 1962.

Most roads concentrated in western regions; few links to eastern areas. One of latter parallels Dakar-Bamako railroad and is partially paved; fully paved from Dakar to Tambacounda by end of 1978. Most roads built before independence; subsequent deterioration due mainly to truck overloading above legal axle limits, particularly trucks carrying phosphates from Taiba and Thies to Dakar. Traffic levels on rural roads vary by season; groundnut evacuation between mid-December and mid-May nearly doubles traffic load average. However, sandy tracks in Groundnut Basin easier to negotiate in rainy season (higher bearing capacity) than in peak-traffic dry season. Projects underway to improve and maintain feeder road network in main agricultural regions as well as in Eastern Senegal.

Total road network 13,300 km; 2,600 km paved, 3,300 all-weather gravel; the rest are partly improved earth roads and ill-defined tracks. Lack of roads in rural areas and poor maintenance for existing ones.

Roads by Region

<u>Region</u>	<u>Road Number</u>	<u>Sections</u>
Cap Vert	N1	Autoroute - Rufisque - Bargny - Diam Niadio - C/R Dougar - Boundary Thies
	N2	Diam Niadio - C/R Ponty - Boundary Thies

Region	Road Number	Sections
Cap Vert (cont'd)	R10	Rufisque - Bambilor - Boundary Thies
	D100	Pointe Dakar - Rte des Puits - C/R Corniche Patte d'oie
	D101	Route de Terme South
	D102	Route Corniche West - Rte Corniche East Rte Hotel et Plage N'Gor
	D103	Route des puits
	D104	Route de Hann
	D105	Route des Almadies
	D106	Route de N'Gor village
	D107	Route de Yoff
	D108	C/R at Cyranos - C/R Hydrocarbures - C/R at N.1 km 8
	D109	C/R at D108 - C/R at N.1 - Camberene
	D110	C/R at D108 - C/R at D103 - Camp Militaire
	D111	C/R at D110 - C/R at D100 -E/F/

Region	Road Number	Sections
Cap Vert (cont'd)	D112	Route Hydrocarbures
	D113	Route Thiaroye s/sea
	D114	C/R N1 - Grand M'Bao
	D115	C/R at N1 - Foyer de Charite
	D116	C/R at Kem Massar - C/R at N1 km 26
	D117	Rufisque - Bargny
	D118	Route Ecole W. Ponty
	Casamance	N4
N4 b		Ziguinchor - Guinea-Bissau Border
N5		Balib - Bignoua - Diouloulou - Gambia Border
N6		Ziguinchor - Boutoute - Tanaff - Pont Sare Keïta - Kolda - Velingara - Taliboulou
R20		Ziguinchor - Oussouye - Diembering
R21		Kolda - Sedhiou - Dionderie
R22		Djinde - C/R at Sitaba - C/R at N4

Region	Road Number	Sections
Casamance (cont'd)	R23	Bretelle de Sitaba
	D205	Kafountine - Diouloulou
Thies	N1	Cap Vert - Boundary - M'Bour - Diosmone
	N2	Cap Vert Boundary - Thies - Diourbel
	N3	Thies - Khombole - Diourbel Boundary
	R32	Meckhe - Diourbel Boundary
	R70	M'Bayakh - Noto - M'Boro Quest
	R670 b	M'Boro Est - Diougou Darou Fall
	D700	Kayar - Popenguine - Sindia
	D701	Sindia - Thies - Noto
	D702	Tivaouane - M'Boro - Route to Taiba
	D703	Mekhe - Diourbel - Fass Boye
	D704	Thilmakha - Diourbel West Boundary
D705	Thiadiaye - Fissel	

Region	Road Number	Sections
Thies (cont'd)	D707	N'Guekoh - N'Gaparou
	D708	N'Dame - Pout
	D709	Diack - C/R at N3
	D711	M'Bour - Joal - Bretelle Pte Sarene
	P702	Tivaouane - Touba Toul
	P703	N'Garine - Somone
	P704	Khombole - Touba Toul - Diourbel Boundary
	D213	Oussouye - Elinkine
	Diourbel	D222
N2		Thies Boundary - Kebemer - Louga Boundary
N3		Thies Boundary - Diourbel - Sine Saloum Boundary
R30		Tiougoune - Kebemer - Sagata - Darou Mousty
R32		Darou Mousty - Bambey - Thies Boundary
R60		M'Backe - C/R Kale - Sine Saloum Boundary

Region	Road Number	Sections
Diourbel (cont'd)	R61	Bambey - Thies Boundary
	D301	Louga - C/R at M'Barocl - Potou
	D305	Diourbel - N'Dindy
	D704	West Thies Boundary - Baba Garage - East Thies Boundary
	P300	Gueoul - N'Gourane
	P301	Tiolom Fall - C/R at R30
	Fleuve	N2
N2		Bretelle de Dagana
N26		Rosso - C/R at N2
N3		Matam - Ourosogui - Diourbel Boundary
N7		C/R at R42 Nevel - Ogo Namari Senegal Oriental Boundary
R40		Podor - N'Dioum - N'Gari
R41		Orefonde - C/R at R42 - Kaedi

Region	Road Number	Sections
Flueve (cont'd)	D401	Bretelle de Dakar Bango
	D402	N'Diayenne - C/R at R40
Senegal Oriental	N1	Sine Saloum Boundary - Tambacounda - Goudiry - Naye - Mali Border
	N2	Fleuve Boundary - Bakel - Kidira - Naye
	N6	Casamance Boundary - Taliboulou - Dioukore
	N7	Fleuve Boundary - Tambacounda - Dioukore
	D500	Neteboulou - C/R at N6
	D504	C/R at N2 - N'Dia - C/R at N1
	D506	Yafora - C/R at Bema N2
	D509	Ebarak - Kedougou - Saraya
	D510	Fongolimbi - C/R at D509
	D512	Tambacounda - Ondoudou
	D515	Taliboulou - Neteboulou
	P508	Koumpentoum - Maka

Region	Road Number	Sections
Senegal Oriental (cont'd)	PSN	Bala - Lountchi
Sine Saloum	N1	Thies Boundary - C/R at Fatick - Kaolack - Senegal Oriental Boundary
	N4	Diourbel - Gossas - Kaolack - Keur Ayip
	N5	Kaolack South - Sokone - Karang
	D603	Passy - Foundiougue
	R60	Kaffrine - M'Bar - Diourbel Boundary
	R61	Foundiougue - Fatick - Diourbel Boundary
	D600	Koutango - Kaffrine - Bretelle de Medina Saback
	D608	Delbi - Maleme - Hodar
	D609	Delbi - Diobene
	D610	M'Bar - Gossas
	P601	N'Dangane - C/R at N1
	P606	Sokone - Drame

C/R = Crossroad

Surface Types

Paved roads: Dakar to Saint-Louis (via Rufisque, Thies, Louga)
Dakar to Mboro (via M'bayeck, Sao)
Dakar to Joal (via Mbour)
Dakar to Kaolack (via Mbour)
Dakar to Kaffrine (via Kaolack)
Dakar to Ziguinchor (via Kaolack, Bignona)
Dakar to Linguere (via Diourbel, Touba, Dahra)
Dakar to Rosso (via Saint-Louis)
Ziguinchor to Kolda (via Tanaff)
Saint-Louis to Matam (via Dagana, Podor)
Touba to Tiougoune (via Sagata, Kebemer)

Gravel roads: Thies to Sinndia
(west) Mekhe to Foundiougne (via Bambey)
Diourbel to Kaolack
Khombole to Baba-Garage
Diourbel to Fatick

(south): Ziguinchor to Oussouye
Bignona to Sedhiou
Sedhiou to N'diama
Tamindala to Guinea border

(east): Kedougou to Niokol Koba (via Mako)
Kedougou to Salemata (via Bandafassi)

Road Administration

Ministries of Public Works, Urbanism and Transport (MPWUT) regulates various transport modes via GOS policy implementation and administers national highway system. Directorate of Public Works (DPW) within MPWUT responsible for construction/maintenance of highways.

Road Fleet Inventory

Central Equipment Fleet (PCM) controls road maintenance equipment. Central workshop in Dakar, with regional shops in Saint-Louis, Thies, and Tambacounda. Majority of equipment between 4 and 10 years

old; 10% over 10 years.

Vehicle Type	Vehicle Condition					Age in Years		
	Total	1*	2*	3*	+10	4 - 10	1 - 4	New
Bulldozers	34	-	12	22	20	4	2	8
Track Loaders	13	-	13	-	7	6	-	-
Wheel Loaders	23	-	5	18	-	2	18	3
Graders	78	4	18	56	32	22	-	24
Total								
70 CV								
100 CV								
130 CV								
Towed Scrapers	7	-	7	-	7	-	-	-
Hydraulic Cranes	4	-	2	2	2	-	2	-
Pneumatic Rollers	5	-	-	5	-	-	-	5
Steel Rollers	16	-	7	9	8	-	8	-
Vibrating Rollers	23	11	-	12	5	8	7	3
Pneumatic Towed Rollers	33	-	13	20	16	17	-	-
Farm Tractors	44	19	-	25	26	14	-	4
Blade Mowers	5	-	3	2	3	-	-	2
Line Markers	6	1	-	5	3	-	3	-
Compressors	10	3	2	5	1	9	-	-
Concrete Mixers	13	1	2	10	10	-	-	-
Motor-pump Units	56	14	16	26	14	26	-	26
Dump Trucks	85	1	18	66	12	37	20	16
Water Trucks	42	1	9	32	-	-	16	9
Rear Engine Trailers	13	4	6	3	7	-	5	1
Repair Trucks	18	6	6	6	-	12	-	6
Tow Trucks	13	3	-	10	7	-	6	-
Service Trucks	41	11	-	30	19	9	-	13
Four Wheel Drive Vehicles	11	1	4	6	4	3	-	4
Lights Trucks	21	5	2	14	-	-	-	-
Flat Bed Trucks	8	-	-	8	6	2	-	-
Tractors	11	-	3	8	5	-	6	-
Total	699	102	158	439	234	201	108	115

1* = to be scrapped
 2* = to be rebuilt
 3* = working condition

Traffic

Roads carry 75% of commercial inter-urban passenger and freight traffic, excluding phosphates. Of 20,000 trucks and pickups registered in Senegal, 2,000 specialize in transporting agricultural products, 1,500 of which owned by private transporters.

Annual Vehicle Registrations, 1963-73^{1/} (Units)

<u>Year</u>	<u>Passenger Cars</u>	<u>Buses</u>	<u>Trucks and Pickups</u>	<u>Truck Tractors</u>	<u>Special Vehicles</u>	<u>Total</u>
1970	40,380	3,485	18,078	563	691	63,197
1971	42,169	3,724	18,728	568	715	65,904
1972	44,444	4,081	19,453	675	754	69,407
1973	47,177	4,222	20,202	767	775	73,143
1976	49,257	4,329	-----	---	---	-----

Note: 22,071 Goods Vehicles in 1976

Annual Compound Growth Rate (%)

1963-68	7.6	8.1	3.2	7.3	2.5	6.1
1968-73	5.6	4.8	3.6	8.9	2.5	5.0

1/ Does not include motorcycles, or trailers and semi-trailers

Note: Statistics are believed to overstate the size of the fleet, since the removal of a vehicle from the fleet is not always recorded.

Source: Directorate of Transport

February 1976

Railroads

Main line from Dakar to Mali border; major branch from Dakar to Saint-Louis (262 km). Minor branches (all from Dakar): to Diourbel, Touba, Kaolack (via Diourbel), Linguere (via Louga). Total network: 1,034 km of meter gauge, but only 70 km double track between Dakar and Thies.

During last decade freight demand exceeded traffic capacity; grossly inefficient use of equipment the main cause; also frequent delays and bottlenecks at Dakar-Bel Air marshalling yard. Derailments a problem; 373 km of track between km 271 and Mali border in extremely poor condition.

Passenger traffic in 1975/76 1.8 million (158 million passenger km); represents 20% of revenues. Main decreases in short-run traffic in and around Dakar.

Railroad Agency

Regie des Chemins de Fer du Senegal (CFS) established 1960; operates all sections and branch lines of Dakar-Bamako railroad. CFS a state-owned public corporation under MPWUT (see Road Administration). CFS infrastructure in poor condition, reflected in revenue/passenger traffic losses. However, CFS carries 70% of Mali's imports and exports, nearly all domestic phosphate production, and part of groundnut crop.

CFS presently being reorganized. Project underway to rehabilitate equipment and general infrastructure.

Railroad Fleet and Traffic Capacity

Estimate of Freight Traffic Capacity 1975/1977

<u>Locomotive Availability</u>		<u>1975/76</u>	<u>1976/77</u> ^{1/}
<u>Type</u>	<u>Horsepower</u>	<u>No. Avail.</u>	<u>No. Avail.</u>
100	610	1 23	1 20

<u>Locomotive Availability</u>		<u>1975/76</u>		<u>1976/77</u>	
<u>Type</u>	<u>Horsepower</u>	<u>No. Avail.</u>		<u>No. Avail.</u>	
500	740	7	44	7	45
600	800	3	23	3	30
1,100	1,050	9	54	9	50
1,200	1,100	6	79	6	77
1,600	1,500	-	-	-	-
2,400	1,950	4	45	4	45
Available hp/year		16,783		16,490	

	<u>1975/76</u>	<u>1976/77</u> ^{1/}
<u>Freight traffic</u>	<u>No. Avail.</u>	<u>No. Avail.</u>
Ton ('000)	1,606	---
Ton-km (mill)	330	---
<u>Performance/avail. hp</u>		
Ton/hp	96	106
Ton-km/hp	19,663	20,313
<u>Estimated traffic capacity ton ('000)</u>		
Ton-km (mill)	---	1,748

1/ Estimate based on figures from 6 months

Fleet of Motive Power (as of February 1977)

<u>Locomotives</u>	<u>Type</u>	<u>HP</u>	<u>No</u>	<u>Max. Load hauled (tons)</u>	<u>Yearly km/loco. 75/76</u>	<u>Avail. (%) Feb. 77</u>	<u>Axle Load (tons)</u>
<u>Line</u>							
<u>Locomotives</u>	BB 100	610	2 ^{1/}	600	7,400	0	12.5
	BB 500	740	8 ^{2/}	650	49,130	50	12.8
	BB 600	800	3 ^{3/}	600	11,900	33	13.0
	BB1100	1,050	10	900	51,000	50	15.0
	BB1200	1,100	6	900	66,050	100	13.5
	BB1600 ^{4/}	1,500	3	1,200	-	-	-

<u>Locomotives</u>	<u>Type</u>	<u>HP</u>	<u>No</u>	<u>Max. Load hauled (tons)</u>	<u>Yearly km/loco. 75/76</u>	<u>Avail. (%) Feb. 77</u>	<u>Axle Load (tons)</u>
<u>Line</u>							
<u>Locomotives</u>							
(cont'd)	CC2400	1,950	4	1,800	44,700	50	15.0
Total			36			55	
<u>Shunting</u>							
<u>Locomotives</u>							
AA	10	150	17 ^{5/}	250	13,380	65	11.0
AA	50 ^{4/}	420	6	500	9,710	50	13.0
AA	50 ^{4/}	420	2	500	-	-	-
BB	60	300	3	350	20,180	33	08.5
Total			28			58	
<u>Railcars</u>							
Z	130	550	6 ^{6/}	90	67,960	67	07.5
Z	120	550	5	90	63,000	40	11.4
Total			11			45	

1/ To be scrapped 1977/78

2/ One to be scrapped 1977

3/ Two to be scrapped 1977/78; third one will be allocated to shunting services

4/ Ordered; supply expected mid-1977

5/ One to be scrapped 1977

6/ Two to be scrapped 1977

December 1977

Fleet of Rolling Stock (as of February 1977)

<u>Freight Cars</u>	<u>No</u>	<u>Total Capacity Seats/tons/m*</u>	<u>Age (Years)</u>		<u>Owner</u>	<u>Allocated to Inter. Traffic</u>
			<u>0-25</u>	<u>over 25</u>		
<u>CFS-Owned Cars</u> ^{1/}						
<u>Covered Box</u>						
Cars	478	13,395	190	288	CFS	156
Open Cars	166	4,205	55	111	"	28
Flat Cars	54	1,360	6	48	"	13
Tank Cars	18	413	-	18	"	8
Total	716	18,960 tons	251	465		202

<u>Freight Cars</u>	<u>No</u>	<u>Total Capacity</u> <u>Seats/tons/m*</u>	<u>Age (Years)</u>		<u>Owner</u>	<u>Allocated to</u> <u>Inter. Traffic</u>
			<u>0-25</u>	<u>over 25</u>		
<u>Privately-Owned Cars</u>						
Hopper Cars	95	4,437	95	-	TAIBA	-
	32	1,316	12	20	PECHINEY	-
Tank Cars	5	220	5	-	TAIBA	-
	3	123	3	-	PECHINEY	-
	32	1,315	26	6	CAT	32
	2	80	2	-	MOBIL	-
	1	25	-	1	BP	-
Refrigerator Cars	1	13	1	-	SOBOA	-
Total	171	5,766 tons	144	27		32
<u>Service Cars</u>	232	-	-	232	CFS	-

1/ Additional seventy-five cars are ordered under CCE-financing (10 tank cars, 15 open cars and 50 covered goods cars)

* in cubic meters

Ports

Port system consists of a major international facility at Dakar, supplemented by secondary ports at Saint-Louis, Kaolack, Ziguinchor. Port of Dakar an excellent sheltered location; free from heavy swells, and siltation; 46 well-equipped berths, good road/rail access. Public enterprise, Port Autonome de Dakar (PAD), operates/maintains port. Cargo tonnage handled at Dakar doubled during last decade; now 6 million tons per year. Major traffic includes: petroleum, phosphates and most of traffic for Mali and Mauritania.

Dakar

Lat. 14° 40' N; long. 17° 24' W.

General holidays: New Year's Day (January 1)
*Easter Monday, El Mauloud, national holiday
*Labor Day (May 1)
Ascension Day
Whit Monday
Assumption Day (August 15)
*Korite
All Saints' Day (November 1)
*Tabaski
Christmas Day (December 25)

* Labor difficult to obtain

Currency: franc C.F.A. (Communaute Financiere Africaine)

Working hours: 08:00 to 12:00; 14:00 to 18:00 hours. Over-
time possible on request. Saturday work after
noon at overtime rates.

Documents required: five crew lists of vaccinations, six lists of
passengers in transit, six lists of passengers
disembarking, four lists of crew's personal
effects, four lists of ship's stores. Mar-
itime declaration of health, two lists of
ports of call. Five ships report inwards,
hatch list.

Accommodation: a safe harbor formed by two jetties. Water
area: 216 hectares. Quays: 7,618 m. Good
anchorage for any size vessel depth at en-
trance, 10.36 m (being dredged to 10.97 m);
at quays 6.40 to 11.89 m. Wharves and berths
as follows -- southern zone: Mole I, 460 m
by 150 m; four berths with 10 m water and five
with 8 m. Mole II, 290 by 100 m; five berths
with 8.5 m water. Median bank wharf, two
berths, one of 10 m depth and one of 6.5 m.
Mole III, three berths, length 350 m for large
steamers, depth 10 m. Eastern bank wharf,
length 200 m, one berth with 10 m water.
Northern zone -- Mole IV, three berths (length
460 m) with depth of 10 m. Mole V, two
berths, length 180 m, depth 11 m on W side,
8 m on E side. Mole VI: two berths, length
180 m, depth 9 m. North bank wharf, one
berth (200 m) depth 8.5 m. Mole VIII (for
fuel) 400 m long; western side -- two berths
at wharf for colliers and, oil bunkering,

depth 10 m. Table and eastern side -- three berths with 10 m depth. One water barge.

Development: in W zone, a fishing quay is under construction with 1,104 m of berths, draft 7 m, and 370 m of berths, draft 10 m.

Shiprepairs: available

Pilotage: compulsory in and out

Airport: Aeroport de Dakar/Yoff, 12.8 km

Working hours: Monday - Friday, 08:00 - 12:00, 14:00 - 18:00 hrs. Saturday 08:00 - 12:00 hrs

Kaolack

Lat. 14° 08' N; long. 16° 04' 30" W.

Approx. 112 km up the R. Saloum. Maximum length of ship navigating river: 105 m.

Documents required: two crew lists, two store lists, two Manifests Pacoville.

Accommodation: whistling and luminous buoy at the mouth of the river. Depth at entrance 3.7 m (all depths based on French hydrographic zero). Maximum length of ship permitted to enter 105 m. One concrete wharf, 630 m long with 4 m alongside. No equipment. Five warehouses with 4,500 sq m storage and open storage platforms of 150,000 sq m. Fresh water available on quay at 15 tons/hr. Rail connections with Dakar. Winds E from January to May, SW to W from August to October; other months variable.

Shiprepairs: minor repairs carried out by C.F.A.O.

Pilotage: compulsory. For this port and for Ziguinchor, pilots embark in Dakar and must be returned there. Embarking and disembarking may be effected on the roads in order to save berth-

ing dues. For Saint-Louis, pilots are taken at sea in front of Senegal River entrance.

Ziguinchor

Lat 12° 35' N; long 16° 20' W.

Accommodation: on River Casamance. Depth on bar varies; maximum 5.18 m, being dredged to 9.14 m. A middle channel (depth 4.42 to 5.03 m) marked by buoys. Passage by day only. Navigable channel (maximum depth 9.14 m) marked by beacons as far as Ziguinchor. Vessels load and discharge alongside private and government jetties. Depth at jetties 5.18 m, three berths 8.23 m.

Pilotage: pilots may be taken in Dakar roads.

Traffic: approx. 98,000 metric tons per year.

Cargo Worked: up to 200 tons of groundnuts can be loaded by mechanical means or by hand labor per day.

Airport: 8 km from port.

Aerodromes

NB: For up-to-date information consult latest issue of Weekly International Notams, International Flight Information Manual, and/or ICAO's Air Navigation Plan for appropriate region.

<u>Location</u>	<u>Elevation M/Temp C</u>	<u>Runway Characteristics</u>				<u>Aircraft/Strength (1000 kg)</u>	<u>Fuel/Octane</u>
		<u>NR/Type</u>	<u>Slope %</u>	<u>Aircraft/Length M</u>	<u>CL</u>		
Dakar/ Yoff	27	01/19	0.18	3490	A	SW30 DW31 DTW75	100JA
14° 44' 41" N	28.5						
17° 29' 59" W							

Remarks: Alternate Aerodromes: Conakry/Gbessia, Freetown/Lungi, Las Palmas/Las Palmas de Gran Canaria, Monrovia/Roberts Infl., Nouadhibou/Nouadhibou, Nouakchott/Nouakchott, Sal I/ Amilcar Cabral.

Aids: ILS(01-II), DME, VOR, RL, LPA(01-I), LVA, LR, LTX, LO, L4, L5, L9, MD, MC, MT, MTD, MS, MFD, MTX, MO. Stopway 01 & 19-60. Clearway 10-240. B747, DC 10 acceptable. LPA01-II and LVA19 planned. No Telex.

Runway Characteristics

<u>Location</u>	<u>Eleva- tion M/ Temp C</u>	<u>Slope NR/Type</u>	<u>Aircraft Length M</u>	<u>Aircraft/ Strength (1000 kg)</u>	<u>Fuel/ Octane</u>
<u>Coordinates</u>				<u>CL</u>	
Matam/ Ouro Sogui					
15° 36' N	26	14/32	1600	C	
13° 19' W	29 (EST)				

Remarks: Alternate Aerodrome: Kaedi/Kaedi.

Aids: MC. DC4 acceptable. MD, MT, MTX planned.

Kaolack
14° 09' N
16° 03' W

Aids: Longest runway estimated at 5,200 ft. No telex. Aerodrome available upon prior approval only.

Podor/ Podor					
16° 41' N	6	15/33	1250	C	
14° 58' W	29 (EST)				

Remarks: Alternate Aerodrome: Kaedi/Kaedi.

Aids: 1976 ICAO lists none, except Stopway 15-150. DC3 acceptable.

Runway Characteristics

<u>Location</u>	<u>Eleva- tion M/ Temp C</u>	<u>NR/Type</u>	<u>Slope %</u>	<u>Length M</u>	<u>CL</u>	<u>Aircraft/ Strength (1000 kg)</u>	<u>Fuel/ Octane</u>
Saint-Louis/ Saint-Louis							
16° 02' 30" N	4	01/19	0.048	1900	B	SW12	
16° 27' 30" W	29.4					DW20 DTW40	

Remarks: Alternate Aerodromes: Dakar/Yoff, Nouadhibou/Nouadhibou, Nouakchott/ Nouakchott.

Aids: RL, LR, LTX, LO, L4, MD, MC, MT, MFD, MO. Stopway 01 & 19-100. Caravelle and DC6B acceptable. No telex.

Ziguinchor/ Ziguinchor							
12° 33' N	25	10/28		1345	C		100
16° 17' W	32.6	INSTR					

Remarks: Alternate Aerodrome: Banjul/Yundum.

Aids: MD, MC, MT, MTX, MO. Stopway 10-300, 28-200. Clearway 10-550. DC4 acceptable. No telex.

* Key

Radio Aids

ILS - Instrument Landing System
DME - Distance Measuring Equipment
VOR - VHF Omni-Directional Range

Lighting Aids

PA - Precision Approach Lighting System
SA - Simple Approach Lighting System
VA - Visual Approach Slope Indicator System
AV - Abbreviated Approach Slope Indicator System
R - Runway Edge, Threshold & Runway End Lighting
C - Runway Center Line Lighting
TD - Runway Touchdown Zone Lighting
TX - Taxiway Lighting

Lighting Aids (cont'd)

- B - Aerodrome or Identification Beacon
- O - Obstruction Lighting

Marking Aids

- D - Runway Designation Markings
- C - Runway Center Line Markings
- T - Runway Threshold Markings
- TD - Runway Touchdown Markings
- S - Runway Sidestripe Markings
- FD - Fixed Distance Markings
- TX - Taxiway Center Line & Holding Position Markings
- O - Obstruction Markings

Additional Lighting

1. Portable Runway Lights (electrical)
2. Boundary Lights
3. Runway Flood Lights
4. Low Intensity Runway Lights
5. Low Intensity Approach Lights
6. High Intensity Runway Lights
7. High Intensity Approach Lights
8. Sequenced Flashing Lights
9. Visual Approach Slope Indicator (VASI)
(an asterisk (*) preceding the element (*L4) indicates lighting available on prior request by phone, telegram, etc.)

Personal Entry Requirements

Both visa and passport required. See Travel and Visa Information for health requirements.

Aircraft

All private and non-scheduled commercial aircraft overflying for non-commercial purposes must obtain prior permission from the Chief de la Division de L'Aviation Civil, Ministere des Travaux Publics de L'Urbanisme et des Transports, Division de L'Aeronautique

Civile, Immeuble Administratif, Avenue Roume, B.P. 549, Dakar, Senegal (telegraphic address: AVIACIVIL DAKAR. TELEX: None) at least 15 days prior to departure (5 days if by commercial telegraph with prepaid reply).

All requests must include (a) name of aircraft operator, (b) type of aircraft and registration marks, (c) route of flight, (d) date and times of arrival or entry into the airspace of Senegal, (e) name of pilot and number of crew, (f) number of passengers, (g) type and amount of cargo, (h) purpose of flight.

Non-scheduled commercial flights landing for commercial purposes must obtain permission at least 45 days prior to departure from the Ministere des Travaux Publics. All requests must include the above information as well as (a) a copy of the operator's license, (b) the number of flights involved, (c) charges assessed to passengers, (d) and the origin and destination of passengers and cargo.

Air Carriers

SONATRA -- Air Senegal -- 50% owned by GOS, 40% by Air Afrique; provides extensive internal service linking Dakar and outlying areas. Fleet of 3 DC 3's, 2 Twin Otters, 1 Aztec, 1 Cherokee, 3 Pawnees.

Senegal also served by following airlines: Aeroflot, Air Algerie, Air Zaire, Air France, Air Mali, Air Mauritaine, Alitalia, British Caledonian, Cameroon Airlines, CSA, Ghana Airways, Iberia, Lufthansa, Nigeria Airways, PAA, Pan American, Royal Air Maroc, Sabena, Swiss Air, and TACV.

Distances*

Dakar to:

Houston	5,233 (via New York)
Kaedi	284
Kaolack	105
Miami	4,904 (via New York)
New Orleans	4,983 (via New York)
New York	3,812
Nouadhibou	428
Nouakchott	252

Paris	2,614
Rome	2,584
Saint-Louis	115
Thies	37
Ziguinchor	172

* in statute miles

UPPER VOLTA

Road Network

In 1977, road network totaled 16,460 km, 8,702 km of which were classified as either national, departmental, or regional roads. Only 42% of classified network is maintained; remainder in generally poor condition. Traffic levels on maintained sections are relatively high: 250 vehicles per day on paved roads, 150 vehicles per day on earth roads, and 30 vehicles per day on improved tracks. Extent of classified network not expected to change until after 1982 but technical characteristics of roads expected to improve dramatically.

	<u>Paved</u>	<u>Ordinary Earth</u>	<u>Improved Tracks</u>	<u>Ordinary Tracks</u>	<u>Total</u>
Total Network (km)	857	1205	2864	11536	16462
Network Under Ministry	857	1205	1988	4652	8702
% of Classified Network Maintained	100%	100%	52%	12%	42%
<u>Traffic Vehicles/Day</u>					
Less than 10	-	-	407	3838	4245
10 - 30	-	-	549	522	1071
30 - 60	-	260	347	200	807
60 - 100	-	76	489	92	657
100 - 200	482	617	196	-	1295
200 - 400	375	252	-	-	627
Greater than 400	-	-	-	-	-
National Roads	857	919	1396	1288	4460

	<u>Paved</u>	<u>Ordinary Earth</u>	<u>Improved Tracks</u>	<u>Ordinary Tracks</u>	<u>Total</u>
Departmental Roads	-	160	210	1550	1920
Regional Roads	-	126	382	1814	2322
Non-Classified Roads	-	-	876	6884	7760

Sources: Transport Sector Study, BCEOM, 1976.
PWD

Maintenance Agencies and Divisions

Public Works Department within Ministry of Public Works responsible for maintaining classified roads. Maintenance operators divided between two 2 divisions: National Road Maintenance Service (SERN), responsible for 4,460 km of roads, and Secondary Road Maintenance Service (SERS) responsible for 4,242 km of departmental and regional roads as well part of the unclassified network (agricultural feeder roads).

SERN - divided into 4 regional subdivisions that supervise 10 districts, which in turn are divided into 36 cantons. SERN operates 3 mobile brigades for resurfacing, and 2 structure construction units.

SERS - headquarters are in Ouagadougou; operates 4 mobile brigades for resurfacing (only 2 operational).

Maintenance Factors

The primary constraint to expansion of Upper Volta's maintenance program is financial, especially a lack of credit. The following factors have been singled out by Louis Berger International as important to Voltaic road maintenance operations.

1. Relatively dense and heavily traveled network with respect to other countries in the Sahel (with the exception of Senegal).

2. Volume of work presently being executed or programmed for the future will substantially increase the national investment represented by the road network.
3. Global transport costs on the road network are estimated at 14.2 billion FCFA for 1977, or approximately 10% of the gross national product. Given that the greater part of transport costs are paid in foreign currency (fuel, equipment purchase, spare parts, and so on), improved road maintenance would make it possible for the country to achieve major savings in foreign currency.

Development of the Paved Road Network
From 1977 to 1982

<u>Sections</u>	<u>Existing</u> <u>(km)</u>	<u>Under-</u> <u>way</u> <u>(km)</u>	<u>Scheduled</u> <u>(km)</u>
Ouagadougou-Sakoïnse	-	56	-
Sakoïnse-Hounde	-	-	194
Hounde-Bobo	-	104	-
Ouagadougou-Ouahigouya	-	-	129
Ouagadougou-Tougouri	-	-	166
Ouagadougou-Koupela	137	-	-
Koupela-Niger	-	-	257
Ouagadougou-Po	163	-	-
Hounde-Banfora	-	85	-
Banfora-Border	-	-	70
Bobo-Orodara-Mali	-	-	130
Bobo-Fo-Mali	122	-	-
Sakoïnse-Koudougou	-	39	-

<u>Sections</u>	<u>Existing</u> <u>(km)</u>	<u>Under-</u> <u>way</u> <u>(km)</u>	<u>Scheduled</u> <u>(km)</u>
Koudougou-Mali	-	-	286
Koupela-Bittou-Togo	<u>151</u>	<u>-</u>	<u>-</u>
Total	573	284	1,232

The following roads are either being rehabilitated or subject to current maintenance projects:

<u>From</u>	<u>To</u>
Fada N'Gourma	Comin-Yanga
Fara	Ouessa
Banfora	Mangodara
Sindou	Baguera
Orodara	Samerogouan
Tougan	Nohoro
Gorom-Gorom	Sebba
Bogande (RD10)	Tarorko
Djibo	Ouagadougou
Garango	Taece
Barsalogho	Tougan
Nouna	Toma
Koudougou	Ben (via Solenzo)
Po	Bittou
Zabre	Manga

Vehicles

As of 1975: 9,530 cars, 215 buses, 9,901 lorries, 499 tractors, 2,074 motorbikes

Equipment

Division of Mechanical Support (DOM) in charge of all equipment. Fleet totals 450 units with a central workshop in Ouagadougou, and small shops in other subdivisions (see below). Present fleet deteriorating; most of it more than 7 years old. Utilization rate is relatively low, averaging 600 hrs per year.

Shops and Their Functions 1977

<u>Location/Subdivision</u>	<u>Buildings</u>	<u>Equipment-Tools</u>	<u>Repair</u>
Dom-Ouagadougou	(2) Workshops Warehouses Carpentry shop Distribution Station	Test bench Trav. crane Press Lathe Milling Machine Compressor	Partial or general overhaul
Bobo-Dioulasso	Workshop Warehouses Stations Carpentry shop	Winch Lathe	Partial overhaul
Fada N'Gourma	Workshop		Minor re- pair
Ouahigouya	Workshop		Minor re- pair
Ouagadougou	Workshop		Minor re- pair
Mobile Units	Trailers		Periodic

Equipment Fleet

<u>Type</u>	<u>DTP-SERN-SEPTN-CFP</u>				<u>Total 1977</u>
	<u>DOM</u>		<u>SERS</u>		
	<u>Existing</u>	<u>Expected</u>	<u>Existing</u>	<u>Expected</u>	
Car and Break	28	2	6	-	36
Station Wagon	63	8	6	-	77
Four-Wheel Drive	2	-	-	-	2
1, 6 and 7 T Truck	20	2	-	-	22
3 T Dump-Truck	51	-	-	-	51
6, 7 T Dump-Truck	21	-	16	12	49
10 T Dump-Truck	32	6	18	-	56
8 & 10,000 lit Water Tank Truck	16	-	7	10	33
Tank Trailer	12	2	-	-	14
Tractor-Trailer	4	-	-	-	4
Tractors	28	-	2	-	30
Pneumatic Roller	4	-	1	2	7
Vibrating Roller	5	-	2	4	11
Towed Roller	22	-	2	-	24
Grader	30	-	4	10	44
Loader	10	-	4	2	16
Bulldozer	14	-	3	2	19
Concrete Mixer	14	-	5	4	23
1,000 lit Asphalt Sprayer	3	-	-	-	3
Towed Flat Bed Trailer	11	-	3	2	16
Radio Transmitter	-	-	-	-	9
Shovel	4	-	1	-	5
Other Equipment	47	-	11	8	66

Source: SERS and DOM

Distances

Ouagadougou to:

Lome	1,000 km (by road)
Cotounou	1,100 km (by road)
Abidjan	1,145 km (by road/rail)

Railroad

The 1,150 km (517 in Upper Volta) Regie Du Chemin De Fer Abidjan-Niger Railway (RAN) runs from Ouagadougou to the port of Abidjan in Ivory Coast; carries 80-90% of import-export traffic. Upper Volta generates about 81% (423 million ton-kilometers) of freight traffic carried by system.

Development

360 km extension to Mali and Niger frontiers, with branch line to manganese deposits at Tambao, is planned.

Railroad Company

RAN, BP 192, Ouagadougou; head office in Abidjan, Ivory Coast. Railway jointly owned and operated by governments of Ivory Coast and Upper Volta under international convention requiring them to cover annual operating deficits, finance 60% of infrastructure improvements in their respective countries. Problems include: management deficiencies, high operating costs, inadequate tariff structure, and loss of traffic to road competition in Ivory Coast.

Rolling stock (1974) included: 689 covered cars with monthly carrying capacity of 30,000 tons and 38 engines. Trip time from Abidjan or Ouagadougou is about one and one-half days.

Ports

No in-country ports. Possible ports of entry are Abidjan (Ivory Coast), Tema (Ghana), Lome (Togo) and Cotonou (Benin). Of these, Abidjan is main one; Tema and Lome the principal alternatives. Relatively little import/export traffic uses Ghana route because cumbersome foreign exchange regulations delay payments by Ghanaian transit companies to Voltan truckers. Since Tema has excess export capacity and a bonded storage area, negotiations to facilitate customs improvements are under discussion. See Annex 1.

<u>Origin</u>	<u>Mode</u>	<u>Distance</u>	<u>Trip Time (Days)</u>				<u>Transport Costs</u>
			<u>Quarter</u>				
			1	2	2	2	
Abidjan	Rail	1,173 km	2	2	2	2	\$40/T
	Road	1,152 km	2	2	3	2	\$69/T
Tema	Road	1,040 km	3	3	4	3	\$62/T
	Road-Lake-Road	845 km	3	3	4	3	\$42/T
Lome	Road	997 km	3	4	5	4	\$60/T
Cotounou Via Niamey	Rail + Road	1,581 km	5	5	6	5	\$90/T

Airports

2 international airports (managed by International Aviation Safety Agency for Africa and Madagascar):

Ouagadougou - 2,500 meter runway capable of handling 4-engine jets

Bobo Dioulasso - suitable for 2-engine jets, DC-6 s, Caravelles

49 small aerodromes, 13 private airfields

Traffic (1972) - 3,416 aircraft arrivals and departures; 873 tons freight unloaded, 607 tons loaded.

Dirt airstrips for small planes: Koudougou, Kongoussi, Kaya, Boulsa, Kouplès, Fada N'Gourma, Bogande, Dori, Gorom-Gorom, Seba, Djibo.

Aerodromes

NB: For up-to-date information consult latest issue of weekly International Notams, International Flight Information Manual, and/or ICAO'S Air Navigation Plan for appropriate region.

Runway Characteristics

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M/</u> <u>Temp C</u>	<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/</u> <u>Length M</u>	<u>CL</u>	<u>Aircraft/</u> <u>Strength</u> <u>(1,000 kg)</u>	<u>Fuel/</u> <u>Octane</u>
Bobo-Dioulasso/ Bobo-Dioulasso 11°10' N 04°19' W	460 32.1	06/24	0.634	2050	B	SW 13 DW 20 DTW 40	100,JA

Remarks: Alternate Aerodromes: Abidjan/Port Bouet, Bamako/Senou, Niamey/Niamey, Ouagadougou/Ouagadougou.

Special Permission will not be granted for aircraft to enter Upper Volta from Rhodesia or South Africa, or to leave Upper Volta for these areas.

AIDS: VOR, AV (06), R, L4, L5, L9, TX, O, D, C, T, FD, TX, O. NO Telex.

Runway Characteristics

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M/</u> <u>Temp C</u>	<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/</u> <u>Length M</u>	<u>CL</u>	<u>Aircraft/</u> <u>Strength</u> <u>(1,000 KG)</u>	<u>Fuel/</u> <u>Octane</u>
Ouagadougou/ Ouagadougou 12°21' N 01°31' W	316 35.1	04/22	0.64	2500	A	AUW 120	100,JA

Remarks: Alternate Aerodromes: Abidjan/Port Bouet, Accra/Kotoka Intl, Bamako/ Senou, Bobo-Dioulasso/Bobo-Dioulasso, Niamey/Niamey.

Aids: ILS (04-1), VOR, SA (04), R, L4, L5, TX, O, D, C, T, TD, FD, TX, O. Stopway 04-500; 22-60. DC 10-30 Acceptable. FVA22+ planned, completion date 1976. No telex.

* Key

INSTR - Instrument Approach Runway

N-INSTR - Non-Instrument Runway

Radio Aids

ILS - Instrument Landing System
DME - Distance Measuring Equipment
VOR - VHF Omni-Directional Range

Key (cont'd)

Lighting Aids

PA - Precision Approach Lighting System
SA - Simple Approach Lighting System
VA - Visual Approach Slope Indicator System
AV - Abbreviated Approach Slope Indicator System
R - Runway Edge, Threshold & Runway End Lighting
C - Runway Center Line Lighting
TD - Runway Touchdown Zone Lighting
TX - Taxiway Lighting
B - Aerodrome or Identification Beacon
O - Obstruction Lighting

Marking Aids

D - Runway Designation Markings
C - Runway Center Line Markings
T - Runway Threshold Markings
TD - Runway Touchdown Markings
S - Runway Sidestripe Markings
FD - Fixed Distance Markings
TX - Taxiway Center Line & Holding Position Markings
O - Obstruction Markings

Additional Lighting

1. Portable Runway Lights (electrical)
2. Boundary Lights
3. Runway Flood Lights
4. Low Intensity Runway Lights
5. Low Intensity Approach Lights
6. High Intensity Runway Lights
7. High Intensity Approach Lights

8. Sequenced Flashing Lights
9. Visual Approach Slope Indicator (VASI)
(an asterisk (*) preceding the element (L*4) indicates lighting available on prior request by phone, telegram, etc.)

Personal Entry Requirements

Passport and visa required. Tourists/transit visa, valid up to 3 months from date of issue, \$2, 2 photos. Fee of \$1.50 for return of passport by mail. Check UN Delegation/Embassy for specific requirements.

Aircraft Entry Requirements

Private and non-scheduled commercial aircraft overflying or landing for commercial or non-commercial purposes must provide prior notice to the Ministere Des Travaux Publics, Direction De L Aeronautique Civile, B.P. 363, Ouagadougou, Upper Volta (telegraphic address: MINITRAVAUX OUAGADOUGOU/telex: none) at least 7 days prior to departure. All notifications must include type of aircraft and registration marks, radio call or flight number, name and nationality of pilot and number and nationalities of crew, complete route of flight, number of passengers and type and amount of cargo, purpose of flight. In addition, a flight plan must be on file at least 24 hours prior to departure.

Non-scheduled commercial aircraft landing for commercial purposes must also obtain, in advance, a temporary operating clearance, in addition to the above notification requirements, from the Ministere Des Travaux Publics.

Airlines

International: Air Afrique - multinational company (Central African Republic, Chad, Congo, Benin, Gabon, Ivory Coast, Mauritania, Senegal, Togo, Upper Volta all have 6% share); address: Ave L. Barthe, BP 21017 Abidjan, main office - 53 Rue Ampere, Paris 17E, France. Fleet of 5 DC-8 S, 3 Cara-

velles, 1 DC-10 (+ 1 on order). Flies to Ouagadougou and Bobo Dioulasso.

Also: Air Ghana, Air Mali and U.T.A.

Domestic: Air Volta (mixed private/public company with monopoly on domestic service.) Rue Binger, BP 116, Ouagadougou. Fleet: 1 Piper Navajo, 1 Cherokee 6.

Air Distances

Bobo Dioulasso:	STM	Ouagadougou To:	STM
Abidjan	410	Abidjan	519
Bamako(ville)	269	Accra	475
Bouake	242	Bamako(ville)	439
Dakar(Yoff)	919	Dakar(Yoff)	1,085
Korhogo	149	Marseilles	2,184
Las Palmas	1,361	Paris(Orly)	2,522
Marseilles	2,301	Segou	330
Mopti-Barbe	231	Tamale	207
Niamey	468		
Nouakchott	911		
Ouagadougou	207		
Paris(Orly)	2,622		
Segou	205		

CAMEROON REPUBLIC

General Holidays: New Year's Day (January 1), Youth Day (February 11), Good Friday, Labor Day (May 1), National Day (May 20), Ascension Day, Assumption B.V. Mary (August 15), Reunification Day (October 1), End of Ramadan, Djoulde Zaihadji, Christmas Day (December 25).

Currency: C.F.A. Franc.

Working Hours: 07:30 to 12:00. 14:30 to 17:30. Saturday: 07:30 to 12:30. Overtime may be worked on Sundays and holidays.

Douala

Lat. 4° N; long. 9° 40' E. 15 miles from river mouth.

Accommodation: The entrance is well marked. The depth of the channel is 20.59 m at L.W. Spring rise of tide 2.24 m, neap rise 1.57 m. Maximum safe draft, from 6.40 m N.T. to 6.85 m S.T. The first buoy, called "A" buoy, is 3° 45' N and 9° 24' E (white light 6 seconds). Other buoys are "B" (red light), "B1" (green light), "C" (green light), "D" (red light) and Base Buoy, 3° 54' N and 9° 32' E (white light), at which steamers await the pilot. Eleven berths of 7 m at L.W. and one of 7 m at Bonaberi for loading bananas. One berth for handling aluminum and coke. Four berths with four sheds totalling 15,000 sq m of covered space.

Labor is always available. Numerous gangs are available for stevedoring operations on board. For ships discharging at quay (depth alongside approx. 7.50 m) there are 11 regular Custom's stores, cement-built with iron roofs, which are supervised by four shipping agents. Working space between ships and sheds 20 to 25 m. Refrigeration for fishing accommodation available. Special open area

for dangerous cargo unloading. Goods, except for heavy cases of motors and iron drums, must be removed from the quay at once to stores. The nearest salvage plant is at Lagos. Railway system connected to quays. Fresh water available at Fr. 190 per ton.

Development: Depth of the channel to be increased to 8.4 m.

Container Handling and
Ro/Ro Facilities: Available.

Bunkers: Diesel oil available in small quantities from trucks alongside. Fuel oil now available from shore line.

Shiprepairs: Atelier Marty, B.P. 1.133, Douala, 1,000-ton floating dock, a shipway and workshops available.

Pilotage: Compulsory. Ships may enter at night. Ships must wire E.T.A. and draft to agents and await pilot at Base Buoy, from which point turn for berthing starts.

Airport: Douala Airport, 4.8 km from town center.

Working Hours: No restrictions on work during night, Sundays or holidays.

GAMBIA

Currency: Dalasi = 25p (D4 = 1).

General Holidays: January 1 (New Year's Day), February 18 (Independence Day), Maulud Nabi, Good Friday, May 1, 15th August (St. Mary's Day), Christmas Day, Id El Fitr (Ramadan) and Eid El Kabir. No cargo work on Islamic holidays.

Stevedoring: 08:00 to 19:00 hours, 48 hours notice must be addressed to the Agent. For Monday, the latest preferable notification is Friday.

Working Hours: 07:30 to 12:30; 13:30 to 19:00 hours. Overtime payable at time-and-a-half from 15:30 to 19:00; a night-shift can be arranged from 19:30 to 07:00. Saturday is an ordinary working day. Double rates payable on Sundays and holidays.

Banjul

Lat. 13° 27' 30" N; long. 16° 35' W.

Accommodation: Depth at entrance 8.53 m L.W.O.S.T.; anchorage close to the town in 14.6 to 27.45 m. Tidal rises 1.83 m Spring tide, and 1.22 m neap tides. Maximum length of vessel is 182.9 m in wharves and unlimited at anchorage. Depth at Govt. Wharf, 8.07 m L.W.O.S.T.; 89.60 m berthing face; four 6/30-ton mobile cranes; mooring dolphin at N end. Bow and stern mooring bollards on foreshore; fresh water available. Banjul Wharf, length 121.9 m, depth alongside 9.14 m L.W.O.S.T. is flanked by a mooring dolphin at each end, set back from the face of the wharf. Berth for small vessels up to 6.40 m draft, on the inside of Banjul Wharf. Two transit sheds available. Jetty for shallow-draft vessels available. The foreshore north and south of the Government Wharf has been reclaimed, giving a large open space area for further development.

Bunkers: Gas oil available.

Shiprepairs: Small jobs only undertaken by G.P.A. dockyard workshop. Slipway capable of handling 400-ton vessels.

Pilotage: Compulsory for vessels entering Gambia River at No. 5 Buoy; obtainable at any point on Fairway by request. E.T.A. and draft to be communicated to "Harbour Master Banjul" 48 hrs. before estimated arrival and confirmed 12 hrs. before. Vessels arriving Monday,

E.T.A. preferably given no later than Saturday morning. Radio call sign "CSG". The Pilot station has VHF facilities, calling channel 16 (156.80); working channels 12 (156.60) and 14 (156.70). Continuous listening watch kept 08:00-15:00 hrs., Monday to Friday and 08:00-13:00 hrs. on Saturday. Listening watch on weekends if vessels are expected. Reception within a radius of 100 sea-miles. Pilot boat exhibits usual signals.

Airport: Yundum Airport, 14 miles.

GHANA.

Sufferance Wharf: A wharf or pier appointed by the Customs on which dutiable and other goods may be landed and loaded under certain conditions without paying duty.

Currency: 100 Pesewas = 1 Cedi
One Cedi = 50p. (Internal)
2.45 Cedis = 1 (Outside Ghana)
One Cedi = C

General Holidays: New Year's Day (January 1), Independence Day, National Redemption Day, Good Friday,* Easter Saturday, Easter Monday, Republic Day, Christmas Day* and Boxing Day (December 25* and 26).

* No work. Takoradi and Tema closed to shipping. Overtime at double pay may be worked on all other holidays and on Sundays.

Working Hours: Shift work: 07:00 to 19:00; 19:00 to 07:00 hours, daily as required.

Tema

Lat. 5° 38' N; long. 0° 1' E. About 18 miles E. of Accra, built on the open coast on the site of a former fishing village.

Accommodation: A water area of about 410 acres is enclosed by breakwaters 2,194 and 1,463 m long; entrance 182.9 m with depth of 9.75 m M.L.W.S.; depth in anchorage 12.80 m R. of T. approx. 1.22 m at mean springs.

Large bitumen surfaced area for open storage of rough cargo. On the finger quay, the area amounts to some three acres; on the marginal quay 31 acres. There are four cocoa sheds, each 134.1 m long and with a clear span of 51.81 m, erected to the west of the marginal quay and with a capacity of 15,000 tons each. The bagged cocoa is carried from storage to ship's hold by a mechanical handling installation serving berths 6 and 7 on the marginal quay. This installation has the capacity to supply two points, each at 15 tons/hr. Berthage:

Three of the five berths on the finger quay are provided with single-story steel framed transit sheds, each 140.20 m long with a clear span of 25.90 m. The fourth berth has a double story steel framed building, 152.4 m long and 25.90 m wide. The upper floor is devoted to customs and other offices, while the lower floor is designed for normal cargo storage. Six of the seven berths on the marginal quay have a single-story transit shed, 121.9 m long with a clear span of 36.57 m, the seventh berth having an open storage area only. A state warehouse for the Customs & Excise Department has a capacity approx. 1,580 sq m. A conveyor system for wheat grain handling at No. 10 berth facilitates transportation of grain from vessels into special storage silos in a flour mill factory behind the security area.

Shiprepairs: There is a small dry dock 53.03 m in length and 14.02 wide at the gate. Also two slipways one of 150 tons and one of 12 tons. A graving dock of 277.3 m long and 47.24 m wide has been completed and commissioned for the Tema Shipyard and Dry Dock Corporation.

Working Hours: 07:30 to 12:30; 13:00 to 16:30 hours. Overtime may be worked for loading/discharging operations up to 20:00 with an additional two hours' work if vessel is to sail immediately. Weekend: overtime at double rates.

Airport: Accra, 27.2 km.

IVORY COAST

General Holidays: New Year's Day (January 1*), Tabaski*, Easter Monday, Labour Day (May 1*), Ascension Day (May 27), Whit Monday, Assumption Day (August 15), All Saints' Day (November 1), Korite,* National Feast Day (December 7*), Christmas Day (December 25*).

During Ramadan, work is restricted.

* No work

Working Hours: Monday/Friday, 07:30 to 12:00; 14:30 to 17:30 hours. Overtime can be worked 13:00 to 14:30, 17:30 to 24:00, 00:00 to 07:30, but must be ordered before 07:00; also on Sunday from 07:30 to 17:30; 17:30 to 24:00; 00:00 to 07:30. Ordinary working hours on Saturday are from 07:30 to 12:00. Overtime workable during above periods.

Abidjan

Lat. 5° 18' N; long. 4° 00' W.

Accommodation: Depth at entrance 10 m. Depth on bar 10 m. Maximum draft allowed in Vridi Canal, 9.75 m, to be increased to 11.28 m shortly. LV: No limit to length of vessels which may use the harbor, but ships over 200 m are subject to special conditions. Main quay 3,130 m with 10 m and 640 m with 11 m alongside. Banana

quay 240 m length, 7 m alongside with belt conveyors and elevators for banana loading. Fishing quay 1,070 m length with 5 and 7 m alongside. There are docks 300 m long, 2 m deep, with special facilities for loading manganese ore; these docks are suitable for barges. There are 14 berths between buoys for loading logs and 15 anchorages outside the lagoon. Refrigerated sheds at the Banana Docks, and also one berth for unloading grain with elevators and belt conveyors. A minimum of 500 tons of cargo per day must be worked on the quayside; vessels handling less than this or lying idle during overtime periods may be required to shift berth at their own expense in favor of vessels wishing to work over 500 tons of cargo. There are warehouses and a wood storage area. Radio and VHF, "Comport" Abidjan. Provisions and fresh water available.

Container and
Ro/Ro Facilities: Two berths for container handling with ship's gear.

Bunkers: Fuel, diesel and gas oil available.

Shiprepairs: CARENA, B.P. 453, Telex: NR. 323. Two dock yards for vessels 600 tons and 2,000 tons.

Towage: Available from the Union des Remorqueurs d'Abidjan and compulsory for all vessels mooring or unmooring alongside buoys, berthing or unberthing and in certain cases for swinging vessels at anchorage before sailing. Two tugs required for berthing at the petroleum terminal.

Pilotage: Compulsory through the Vridi Canal.

Traffic: 1976, 7,694,329 tons cargo in and out.

Airport: Abidjan/Port Bouet, 8 km.

Working Hours: Monday to Saturday: 07:30 to 12:00 hours; 14:30 to 17:30 hours. Other hours in overtime.

NIGERIA

Lagos

Lat. 6° 27' N; long. 3° 24' E.

Accommodation: Bar draft 9.14 m L.W. Entrance protected by moles. Apapa Quay is the largest in Nigeria and has direct rail connection with the main line system of the Nigerian Railway Corporation; also well served by road transport and inland waterway connections; nearby is the industrial estate of the Lagos State Development & Property Corporation. This quay handles two thirds of the total seaborne trade of the country and some cargo in transit to and from the Niger, Chad, Upper Volta and the Cameroons.

Quay facilities:

<u>Berth</u>	<u>Length</u> <u>m</u>	<u>Maximum</u> <u>Draft</u> <u>m</u>
No. 1	152	8.23
No. 2	146	8.23
Nos. 3, 4, 5, 6, 7, 9, 10, 11, 12 and 13	152	8.23
No. 6	183	8.23
No. 7A	122	8.23
No. 14	220	8.23

<u>Berth</u>	<u>Length</u> <u>m</u>	<u>Maximum</u> <u>Draft</u> <u>m</u>
Lighter Berth	116	4.88
Fish Wharf	85	5.79
B.O.P. (Lever Bros.)	152	7.62
P.W.A. (for ocean-going tankers)	177	7.62
P.W.A. (Inner-for coasters)	96	4.88
Ijora Wharf	122	5.79
Anchorage No. 1 pool	146	7.32

<u>Berth</u>	<u>Length</u> <u>m</u>	<u>Maximum</u> <u>Draft</u> <u>m</u>
Anchorage No. 2 pool	183	8.53
Anchorage No. 3 pool	137	7.92
Anchorage No. 4 pool	137	7.92
Marine Mooring Buoy No. 1	152	7.92
Marine Mooring Buoy No. 2	140	7.92
Marine Mooring Buoy No. 3	140	7.93
Marine Dolphin	76	5.79
Plus 22 mooring buoy berths		

Development: At Apapa Wharf, 1,500 m long quay under construction with six berths, some for container traffic.

At Tin Can Island, 2,000 m long wharf under construction, with ten berths.

At the Ocean Terminal, ten berths under construction.

Bunkers: Oil and coal bunkering facilities available.

Shiprepairs: The Nigerian Ports Authority maintains a large dockyard installation including a modern floating dock with a lifting capacity of 4,000 tons. Several shipping agencies maintain smaller repairing installations, including small slipways.

Towage: 24 hour service available; tugs include three of 1,490 b.h.p., two of 1,280 b.h.p. plus several tugs for towing lighters, etc.

Pilotage: Compulsory, 24 hour service available.

Airport: Ikeja, 14.4 km from port.

Local Holidays: The port is always open except for Christmas Day.

Port Harcourt

Lat. 4° 46' N; long. 7° E 65.6 km up Bonny Estuary from Bonny.
Terminus of railway and port from which coal from Udi is shipped.
Second largest port in Nigeria.

Accommodation: The maximum draft for entering port is 7.62 m at H.W. (minimum depth of water in approaches 5.49 m); Bonny Channel is 11.73 m deep and Okrika is 9.14 m deep at Chart Datum. The port is well served by rail and road transport and is a transit port for cargos to and from Chad and Niger.

Quay facilities:

<u>Berth No.</u>	<u>Length</u> <u>m</u>	<u>Maximum</u> <u>Draft</u> <u>m</u>	<u>Remarks</u>
1	158	7.92	
2	158	7.92	
3	158	7.92	
4	110	7.92	
5	128	7.92	
6	134	7.92	
7	134	7.92	
8	137	7.62	Coal berth with conveyor to storage hoppers.
9	143	7.62	B.O.P. berth for loading palm oil by direct pipeline, and unloading explosives.
10	137	6.71	Kidney Island.

<u>Berth No.</u>	<u>Length</u> <u>m</u>	<u>Maximum</u> <u>Draft</u> <u>m</u>	<u>Remarks</u>
11	137	6.71	Timber Buoys.
12	107	6.55	Pool Anchorage.
Lighter berth	8	1.83	
Tanker buoys	244	6.71	

Eleven transit sheds and four warehouses available; seven stacking areas; sixteen storage tanks for bulk vegetable oil at the N end of the Main Quay, and connected to the B.O.P. Berth.

Development: Four berths planned at a new port site.

Bunkers: Available.

Shiprepairs: The Authority operate a small shipyard, maximum capacity 81 tons.

Towage: Available.

Pilotage: Compulsory from Bonny Fairway Buoy; 24 hour service.

Airport: Port Harcourt, 11.2 km from port.

Local Holidays: Port always open except for Christmas Day.

TOGO REPUBLIC

Holidays: New Year's Day (January 1), National Holiday, Sarakawa, Easter, National Day, Labour Day, Whitsun, Pya Martyrs, Assumption Day, Kpalime Historical Call, All Saints' Day, Christmas Day.

Lome

Lat. 6° 7' N; long. 1° 13' E.

Accommodation: The port consists of the following: one principal jetty, 1,720 m long; one mole 366.50 m long and 71.50 m wide, made of concrete. At the end of the mole there are four posts for mooring, two of 10.50 m depth, one of 9.50 m and a fourth of 5.50 m, reserved for small

vessels and tugs. Width of mole is 26 m at east and 15.5 to the west. Two warehouses on the mole, one of which is 4,500 sq m and the other 2,250 sq m. Capable of handling approx. 250,000 tons p.a.; possibly handling up to 500,000 tons with the installation of extra cranes on the quay. One water tank of 500 cu m at Tokoin (town of Lome). Water piped to principal areas. Rail and road transport inland.

Development: A big fishing harbor and tanker terminal under construction. The construction of a harbor office is taking place on the mole. An extension program planned including more warehouses.

Container Facilities: Available.

Offshore Facilities: Available.

Towage: Available.

Pilotage: Not compulsory but available.

Airport: 8 km from the Port.

Working Hours: 06:00 to 14:00, 14:00 to 21:30 hours. No overtime can be worked. Saturday is an ordinary working day. Sundays and holidays can be worked at overtime rates.

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Written by Thomas Philippi