

**PERFORMANCE AND IMPACT INDICATORS
FOR TRANSPORT IN SENEGAL:
Detailed Statistics – June 2004**

ACCESS

Roads : **Rural Accessibility** (% of total rural population within 5 km of all-season road)

→ **62.5%**

Department	Population	% of the rural population with access to a road within 5 km	
		No Access	Access
Total Rural Population in Senegal	4 475 058	37.5	62.5
Rufisque	57 187	-	100
Mbour	220 489	27.0	73.0
Thiès	236 038	17.2	82.8
Tivaoune	185 656	29.8	70.2

Source: DPS (Direction de la Prévision et de la Statistique) - base de données des villages

Regional significance for the Dakar-Thiès project: Approximately 80% of the total rural population of the abovementioned cities, through which the Dakar-Thiès Toll Road would pass, has access to an all-season road within 5 km, whereas only 62.5% of the total rural population in Senegal has such access.

Indicators for Vehicle Ownerships

Ownership of vehicles (share of households with one)

	Urban	Rural	All
Private car	8.94%	1.49%	4.80%
Motorcycle	4.41%	2.33%	3.25%
Bicycle	6.21%	11.33%	9.06%

Source: Household surveys – 2001

	2001	
	Urban	Rural
Population	40.7%	59.3%
Household	44.4%	55.6%
Household size	8.4	9.7
Household size - national average	9.1	

Source: Household survey 2001

Roads/Rural : Rural Motor Vehicle Ownership (% of rural households owning at least one private car)
 → **1.5%** *Source: Household survey - 2001*

Roads/Rural : Rural Motorcycle Ownership (% of rural households)
 → **2.3%** *Source: Household survey - 2001*

Roads/Rural : Rural Bicycle Ownership (% of rural households)
 → **11.3%** *Source: Household survey - 2001*

Roads/ Urban : Urban Motor Vehicle Ownership (% of urban households owning at least one private car)
 → **8.9%** *Source: Household survey - 2001*

Roads/Urban : Urban Motorcycle Ownership (% of urban households)
 → **4.4%** *Source: Household survey - 2001*

Roads/Urban : Urban Bicycle Ownership (% of urban households)
 → **6.2%** *Source: Household survey - 2001*

Roads : Motorized Road Vehicle Ownership: Private car (% of total households)
 → **4.8%** *Source: Household survey - 2001*

Roads : Motorized Road Vehicle Ownership: Motorcycles (% of total households)
 → **3.3%** *Source: Household survey - 2001*

Roads : Non-Motorized Road Vehicle Ownership: Bicycles (% of total households)
 → **9.1%** *Source: Household survey - 2001*

Motor Vehicles: Indicator for Vehicle Ownership

→ **20.6 per 1000 inhabitants, of which 14.8 are passenger cars**

According to the official statistics, the rate is 20.6 motor vehicles per 1,000 inhabitants in the Dakar region and only 7.2 throughout the rest of the country. The level of car ownership in some rural regions is very low (less than 2 per 1,000 in Fatick and Kolda).

Région	% of total population	% of total vehicles	Motor Vehic per 1,000 inh.
Senegal	100%	100%	20.6
Dakar	25.1%	74.0%	60.9
Thiès	13.8%	8.2%	12.3
Ziguinchor	5.7%	1.0%	3.8
Diourbel	9.6%	5.4%	11.6
Saint – Louis	8.7%	3.0%	7.1
Tambacounda	5.4%	1.3%	4.8
Kaolack	11.5%	3.2%	5.7
Louga	5.5%	2.8%	10.4
Fatick	6.4%	0.5%	1.7
Kolda	8.5%	0.6%	1.6

Source : DTT Jan.2004 for number of vehicle and DPS for population

How many road motor vehicles (excluding two-wheelers) are really in circulation in Senegal?

We have relied on the official statistics published by the DTT. It must be noted that the reliability of these statistics has been questioned through the assertion that the vehicles which are withdrawn from circulation are not always removed from the statistical analysis.

The official statistics show the following breakdown of vehicles by age:

Repartition of motorized vehicles, by age

Age in yrs	Less than 5	>5 and <10	>10 and <15	>15 and <20	>20
Senegal	8.9%	8.1%	22.4%	30.4%	30.3%
Dakar	10.5%	9.4%	23.2%	29.0%	27.9%
Rest of the country	2.8%	4.8%	22.3%	32.6%	37.4%

Source: DTT (Jan.2004)

The statistics reveal that about 60% of motor vehicles are at least 15 years old. The vehicles in Senegal are relatively old on average, as in many African countries. The importation of used cars in the 1990's has been an impetus for the increase in motor

vehicle ownership. Furthermore, vehicles are usually repaired rather than discarded. Many vehicles have required their motor to be changed several times, evidenced by the importation of spare parts in proportion to the importation of new vehicles. But it is also likely that a significant portion of the vehicles in these statistics, especially those above 20 years of age, are no longer in circulation.

How do the estimates for motor-vehicles derived from the household survey compare with the statistics concerning vehicles in circulation ?

Based on the 2001 household survey, we arrive at a figure of 5.3 private cars per 1000 people on average (table below).

	2001		
	Urban	Rural	All
Population	40.72%	59.28%	100.00%
Household	44.43%	55.57%	100.00%
size of av. Household	8.35	9.72	9.11
Private car ownership in % of households	8.94%	1.49%	4.80%
Private Cars per 1000 inhabitants	10.7	1.5	5.3

This result of 5.3 cars per 1000 inhabitants is much lower than the 14.8 passenger cars per 1000 inhabitants found above.

However, the two figures do not measure the same reality:

- the household dates from 2001, whereas the ratio derived from the statistics is for December 2003; the rate of ownership increased during that time period
- the household survey gives no indication regarding households that own several vehicles
- more importantly, the household survey only measures the ownership of private cars by household

A very large proportion of passenger cars in Senegal are owned by businesses; this phenomenon is not reflected in the household survey.

We have different sources of information, each with some limitations:

- the household survey does not reflect the fact that many households have cars at their disposal that they do not own
- the statistics from the DTT probably overstate the number of motor vehicles in Senegal

In terms of evolution, the number of vehicles continues to grow in Senegal, but the ban on the importation of used vehicles more than 5 years old seems to have had an impact on the number of new vehicle registrations.

Registration of new vehicles (1,000) excluding two-wheelers

Year	2000	2001	2002	2003
Number	23.2	25.7	26.3	24.1

Increase/decrease		10.7%	2.6%	-8.5%
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Source: DTT (Jan.2004)

Roads : Road Density (length of total road network in terms of population)
[km/1000 people]

→ **1.49 km per 1000 people**

	Populat. in 1,000	Paved Roads in km	Unpaved in km	Total in km	Road density km per 1,000	Paved Road Density
TOTAL	9803	4554	10057	14611	1.49	0.46
Dakar	2412	293	13	306	0.127	0.122
Thiès	1349	507	486	993	0.736	0.376
Ziguinchor	558	324	729	1053	1.888	0.581
Diourbel	930	206	336	542	0.583	0.221
Saint-Louis	863	671	1422	2093	2.425	0.777
Tambacounda	530	703	3053	3755	7.081	1.325
Kaolack	1128	368	1036	1405	1.245	0.326
Louga	559	590	1104	1694	3.029	1.055
Fatick	639	375	449	824	1.290	0.586
Kolda	835	517	1428	1946	2.331	0.620

Source: Road Data AATR - Population : DPS (July 2001)

In 1996, the total length of paved roads per 100,000 inhabitants in the Dakar and Thies regions were 15.1 km and 40.7 km respectively (as opposed to 12.1 and 37.6 today). The decrease in road density reflects the fact that population growth is outstripping road development, especially in urban areas.

Roads : Road Network Coverage (total road network in terms of land area)
[km/1000 km²]

→ **74.3 km/1000 km²**

	Land area (1,000 km ²)	Paved Roads in km	Unpaved in km	Total in km	Road cover. (road km per 1,000 km ²)	Paved Road coverage	Paved Road coverage in 1996
TOTAL	196.7	4554	10057	14611	74.3	23.1	21.7
Dakar	0.6	293	13	306	556.6	533.0	529.0
Thiès	6.6	507	486	993	150.4	76.8	71.0
Ziguinchor	7.3	324	729	1053	143.5	44.2	44.1

Diourbel	4.4	206	336	542	124.3	47.2	46.1
Saint-Louis	44.1	671	1422	2093	47.4	15.2	15.2
Tambacounda	59.6	703	3053	3755	63.0	11.8	7.8
Kaolack	16.0	368	1036	1405	87.7	23.0	23.0
Louga	29.2	590	1104	1694	58.0	20.2	20.2
Fatick	7.9	375	449	824	103.9	47.2	46.0
Kolda	21.0	517	1428	1946	92.6	24.6	24.6

Source: AATR

Roads : Urban and Rural Mobility

Average distance to the nearest transport stop

→ 6 km in rural areas

→ Data not available for urban areas

Source : *Enquête sur les indicateurs de santé au Sénégal - 1999*

The average distance to a public transport stop is obviously shorter in urban areas even if no precise transport stop is available for urban populations. A significant piece of evidence is that walking is used for 78.9% of trips to a public transport stop in urban areas, and only 42.2% for rural populations in spite of a much higher rate of motorization for urban populations.

Generally speaking, walking is the dominant mode of transportation for access to services, shops and public services in urban areas, as it is used for more than 90% of trips to primary school, daily markets and shops. Walking is the primary mode of transportation for access to most services in rural areas as well.

With regard to rural areas, the results of the study have shown that walking remains the primary mode of transportation up to a distance of 5 km. A notable difference between urban and rural transport is that horse carriage is still a significant mode of transportation in rural areas. It ranks second most common behind walking in terms of access to most services (except for the weekly market, for which horse carriage is the primary mode of transportation, followed by motorized vehicles).

The use of motorized transportation remains limited in rural areas in spite of the growing average distance to services. For instance, the ESIS study shows that, in spite of an average distance to the weekly market that is 2.3 times longer for rural populations than urban populations, motorized transportation is used only about one out of four times in by rural inhabitants, compared to 1 out of 2 times for the urban population.

Service	Urban/ Rural	Average Distance from residence	Average Time	Walking %	Horse Carriage	Motorized Trans.	Bicycle	Other
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Primary School	Urban	-	-	99.4	0.1	0.4	0.0	0.0
	Rural	-	-	83.1	9.4	4.6	2.5	0.4
Daily Market	Urban	-	-	91.3	1.1	5.1	0.0	2.5
	Rural	5.0	30.3	51.7	26.9	14.0	3.3	4.2
Weekly Market	Urban	3.7	20.7	44.9	0.6	48.4	0.0	6.1
	Rural	8.6	40.2	26.7	38.1	25.8	1.9	7.6
Shops	Urban	-	-	99.2	0.1	0.0	0.0	0.8
	Rural	-	-	78.3	11.4	3.4	2.9	4.0
Public Transport	Urban	-	-	78.9	2.1	15.1	0.0	4.0
	Rural	6	30.3	42.2	28.1	18.3	2.2	9.1

Source: *Enquête sur les indicateurs de santé au Sénégal (1999)*

The analysis of the data presented above can be usefully complemented with the results of the 2001 Household Survey. The main difference is that the household survey gives information on the *time* to public transport rather than the distance to public transport.

Share of the population

Time to public transport (min)	Urban population	Rural population
0-14 min.	76%	42%
15-29 min.	16%	12%
30-44 min.	4%	8%
45-59 min.	2%	5%
60+ min.	2%	34%

Source: *Household survey 2001*

This chart is more informative than are the statistics for average distance to public transport. It shows an interesting distribution of the rural population, as more than half (54%) of the rural peoples in Senegal live relatively close (less than half an hour) to a transport stop. Interestingly, only 13% of the rural population lives between 30 min and one hour away from a transport stop. However, more than a third of the rural population lives more than one hour away.

Share of the population more than one hour away from public transport

→ 34% in rural areas

→ 2% in urban areas

Share of the population less than 30 min, away from public transport

→ 54% in rural areas

→ 92% in urban areas

Source: *Household survey 2001*

Rail : Railway Density (in terms of population) [km/1000 people]

→ 0.092 km/1000 people

Total Rail Network: 906 km

Total Population: 9,802,775

Source: (*see 'Measures Used as Input for Indicators'*)

Rail : Railway Coverage (in terms of land area) [km/1000 km²]
→ **4.61 km/1000 km²**

Total Rail Network: 906 km

Land Area: 196,700 km²

Source: (*see 'Measures Used as Input for Indicators'*)

Air : Aircraft Departures (thousands)
→ **3.4**

Passengers carried (1,000): 245

Freight (millions of ton/km): 7

Source: World Bank, World Development Indicators (data for year 2002)

AFFORDABILITY

Roads : Motor Vehicle: fuel prices

Gasoline Prices (US\$/liter); reference period march 2004
 → **\$0.92/liter**

Gas/Diesel Oil Prices (US\$/liter)
 → **\$0.65/liter**

	Super	Diesel
March 2004	497 FCFA/liter	348 FCFA/liter

Source: GPP (April 2004)

Fuel Price Structure (August 2002)

	Super	Diesel
Import price	29.0%	39.8%
Distribution costs	9.5%	12.2%
Total taxes, of which	61.5%	48.0%
- specific taxes	46.8%	33.4%
- VAT	14.7%	14.6%
Total retail price	100%	100%

Taxation of oil products is relatively high in Senegal and represents more than half of the final retail price. As a result, fuel prices are on average higher than in Sub-Saharan African countries.

Fuel Prices in 2002 (USD per liter)

	Super	Diesel
Average Sub-Saharan Africa	0.64	0.51
Average for low income countries	0.54	0.41
Senegal	0.75	0.53
Price in Senegal/Price SSA	117%	104%
Price in Senegal/Price Low Inc. Countries	139%	129%

Source: WDR indicators 2002

All : **Household Spending on Transport Services** (% of household expenditure)
 → **5.6%**

Urban : Urban Household Spending on Transport Services
→ **6.3%**

Rural : Rural Household Spending on Transport Services
→ **3.9%**

Share of Transport spending in total household expenditure

Urban		Rural		Senegal	
1994	2001	1994	2001	1994	2001
4.8%	6.3%	3.1%	3.9%	3.6%	5.6%

Source: Household surveys (2001 and 1994)

Roads : Road User Charge (share of total road expenditure) [%]
→ **310% in 2003**

In 2003, tax receipts related to roads (mainly fuel taxation, VAT and custom duties on vehicles and spare parts) amounted to approximately 129 billion FCFA.

Expenditure devoted to roads were about 40.8 billion FCFA (comprised of investments and maintenance).

Source: (*see 'Measures Used as Input for Indicators'*)

Rail : Rail Passenger Tariff (US\$/passenger-km)
→ **Long Distance: \$0.041 per passenger-km**
→ **Urban: \$0.007 per passenger-km**

	Price/km in FCFA	Price/km US cents
Rail passenger tariffs – 2 nd class		
Suburban (Dakar- Rufisque)	3.6	0.7
Long distance (Dakar- Bamako)	21.8	4.1

Rail passenger tariffs in Dakar are quite low. By comparison, long distance train travel is significantly more expensive in terms of fare per km.

Rail : Rail Freight Tariff (US\$/tonne-km)
→ **\$0.06 / ton-km**

Based on recent prices for a selected number of products. This does not include container tariffs which can be substantially different.

Rail Freight Tariffs on Dakar-Kidira, distance 640 km

	Tariffs FCFA	Unit	Price of ton/km FCFA	Price of ton/km USD
Cereals	17309	ton	27.0	0.050
Hydrocarbons	15580	1000 liters	24.3	0.045
Building materials	20600	ton	32.2	0.060
Others ("groupages")	25500	ton	39.8	0.074
Average				0.057

Source: Transail June 2004

Conversion rates: 1 EURO = 655.957 FCFA, 1EURO = \$1.22 US

Ports : Port Handling Cost (in Dakar) (Twenty Foot Equivalence Unit from ship to gate and vice-versa) [US\$/TEU]
→ \$ 270

Handling costs in Dakar

Container of 20'	Average cost
Handling (on board)	35 000 FCFA
Handling (on land)	110 000 FCFA
Total Dakar Port Handling Cost	145 000 FCFA

Source: *étude compétitivité de la voie sénégalaise de desserte du mali, volume 2 (2002)*

Total Dakar Port handling cost: 145,000 FCFA,

Conversion Rates: 1 EURO = 655.957 FCFA; 1EURO = \$1.22 US

Ports : Cargo Handling Cost (covers ship to shore handling) [US\$/ton]
→ NA

QUALITY (Perception)

All/Rural : Travel Time by Rural Households

(hours/day by rural household)

→ NA

All/Urban : Travel Time by Urban Households

(hours/day by urban household)

→ NA

Urban : Travel Time to Work in Main Cities

(minutes/one-way work trip in main cities)

→ NA

An old source (1998) gives a figure of 17.3 minutes, which seems surprisingly low and inaccurate as a reflection of the current traffic situation in Dakar that is characterized by quasi-permanent congestions.

Source: Infrastructure Database – World Bank Infrastructure Vice Presidency (data for 1998)

Roads : Commercial Perception of Road Department/Public Works Services

(Rated on a scale of 1-6; 1=very good, 2=good, 3=slightly good, 4=slightly bad, 5=bad, 6=very bad)

→ **3.8**

Source: Firm level survey 2000. Average answer for 89 respondents. Question - “Please rate the overall quality and efficiency of services delivered by the following public agencies or services: Road Department”

Rail : Commercial Perception of Railway Services and Infrastructure

(1=underdeveloped; 7=as extensive and efficient as the world’s best)

→ **1.5**

Among 102 rated countries, the average score for railroad infrastructure development is 3.1, with Senegal ranking at #82.

Source: Global Competitiveness Report (2003/2004)

Ports : Commercial Perception of Port Facilities and Inland Waterways

(1=underdeveloped; 7=as developed as the world’s best)

→ **3.5**

Among 102 rated countries, the average score for port infrastructure quality is 3.9, with Senegal ranking at #58.

Source: Global Competitiveness Report (2003/2004)

Air : Commercial Perception of Air Transport Services (1=infrequent and inefficient; 7=as extensive and efficient as the world's best)
→ **4.3**

Among 102 rated countries, the average score for air transport infrastructure quality is 4.5, with Senegal once again ranking at #58.

Source: Global Competitiveness Report (2003/2004)

Ports : Cargo Handling Services: Market Openness to potential foreign suppliers (rated from 0 to 1)
→ **0**

Index Values for the rating scale:

0: there is no restriction

0.25: minor restrictions exist

0.5: a joint venture condition is imposed

0.75: a high national participation in the capital of the foreign company is required

1: foreign companies are not allowed to provide cargo handling services at all

Source: "Trade in International Maritime Services: How Much does Policy Matter?" by Fink, Mattoo, and Neagu (2000)

QUALITY (Technical Dimension)

Roads : Paved Roads (% of total road network)

→ **31.2%**

As expected, there is a strong correlation between the population density of each region and the proportion of paved roads in those respective regions.

	Proportion of paved roads	Population density (inhabitants per km ²)
TOTAL	31.2%	49.8
Dakar	95.8%	4384.6
Thiès	51.1%	204.3
Ziguinchor	30.8%	76.0
Diourbel	37.9%	213.4
Saint-Louis	32.1%	19.6
Tambacounda	18.7%	8.9
Kaolack	26.2%	70.5
Louga	34.8%	19.2
Fatick	45.5%	80.5
Kolda	26.6%	39.7

Source: AATR

According to the WDR indicators the proportion of paved roads in SSA Africa is 12.9% on average while being 16% in low income countries (based on the latest data available in the 1996-2001 reference period).

Roads : Road Motor Vehicle Fatalities

→ **per vehicles** (fatalities/10,000 vehicles): **42.7**

→ **per population** (fatalities/100,000 people) : **7.8**

The reported number of road fatalities in 2002 is 783 (along with 4,473 injuries). The figures for 2003 are not yet finalized. The statistics for the number of road accidents, injuries and fatalities are compiled in the BAAC (Bulletin d'Analyse des Accidents Corporels) within the Ministry of Transport (DTT) on the basis of reports filled out by the police in urban areas and gendarmerie (rural areas for each accident). There may very possibly be a significant proportion of under-reporting.

	SENEGAL	DAKAR	THIÈS
Fatalities per 10,000 veh.	42.7	12.9	67.2

Fatalities per 100,000 inh.	7.8	7.3	6.9
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Source: DTT (figures for 2002)

In spite of concentrating most of the vehicles in Senegal, the fatality rate in Dakar compared to population is slightly below the national average. The rate of fatalities per 10,000 vehicle is relatively high in the Thiès region, reflecting the importance of transit through the region.

Roads : Roads in Fair/Good Condition (% of total road network)
→ 28.1%

Road Condition	% Good	% Fair	% Poor	% Very Poor
All Roads	7.5%	20.6%	47.5%	24.4%
Paved	20.7%	36.4%	27.6%	15.3%
Unpaved	1.2%	13.1%	56.9%	28.7%

Source: AATR, based on inspections carried out in 2001-2002 to prepare the current three year maintenance program. More than 90% of roads in Senegal have been inspected.

There is a significant difference in the condition of paved and unpaved roads: more than 57% of paved roads are in good or fair condition, contrasted with less than 15% of unpaved roads being in good or fair condition.

This main explanation for this dichotomy lies in regional differences. For instance, Dakar and Thiès, which are urbanized and have a large proportion of paved roads, are above the national average in terms of proportion of roads in good fair condition. However, given the predominance of paved roads in the Dakar region, the overall condition of its roads is relatively poor. For example, only 37% of the paved roads in Dakar have been assessed as being in good or fair condition compared to 57% for the national average. On the contrary, 67% of the paved roads in the Thiès region are in good or fair condition. This might be explained by the role of Thiès as a crossroad area with a high proportion of transit comprising its traffic.

REGION	% Good or Fair	% Poor or Very Poor
Total for Senegal	28.1%	71.9%
Dakar	38.3%	61.7%
Thiès	56.4%	43.6%
Fatick	27.8%	72.2%
Kaolak	16.3%	83.7%
Kolda	15.6%	84.4%
Longa	31.5%	68.5%
Saint-Louis	31.9%	68.1%
Ziguinchor	47.2%	52.8%

Tambacounda	24.7%	75.3%
Diourbel	47.1%	52.9%
Matam	26.5%	73.5%

Urban : Work Trips in Urban Areas by Mode (% of work trips by transport mode)

- (a) Urban trips to work by bicycle, foot or other modes (% of work trips)
→ **44.8%**
- (b) Urban trips to work by bus or minibus (% of work trips)
→ **45.5%**
- (c) Urban trips to work by private motorized vehicle (% of work trips)
→ **9.3%**
- (d) Urban trips to work by train-tram
→ **0.4%**

Source: Infrastructure Database – World Bank Infrastructure Vice Presidency (data for 1998)

Urban : Passenger Transport by Mode in Dakar (% of total trips)

The subsequent table presents the share of different modes of transportation within the Dakar agglomeration (excluding walking), according to a 2001 study commissioned by the CETUD. Travel by bus is the dominant mode of transportation in Dakar (above 62% of the total number of trips), followed by taxis (21.3%) and then individual cars (9.2%). By comparison, the share of train travel is small (0.4%), with water (0.2%) being even smaller. It should be noted that these figures provides the share of different transport modes in terms of number of trips, *not* passenger-km.

Mode of transportation	%
Bicycle	0.8%
Motorbike	4.2%
Total 2 wheel vehic.	5.1%
Car rapide	35.6%
Ndiaga ndiaye	22.4%
SOTRAC buses	2.8%
Total Buses	60.7%
Taxis (urban)	9.2%
Taxis (suburban)	5.3%

Taxis (“clandos”)	6.8%
Total taxis	21.3%
Individual car- driver	6.2%
Individual car- passenger	3.1%
Total individual cars	9.2%
Horse carriage	0.9%
School buses	1.4%
Interurban buses	0.1%
Lorries	0.7%
Train	0.4%
Boats	0.2%
Total others	3.6%
Total	100%

Source: *Enquête/Mobilité CETUD (August 2001)*

The low passenger share of rail in terms of urban trips can be explained by limited supply, with only one line (Dakar-Rufisque-Thiès) providing limited service. The number of passengers carried has significantly increased between 1998 and 2003 (+8.9% per year on average) in spite of a diminution in the number of services. There is a significant unmet demand, as passengers are oftentimes unable to board the train during peak hours. Road congestion in Dakar should obviously favor the demand for train transport provided that there is adequate supply.

Petit Train Bleu

Number of passengers in 2003 (in 1,000)	6106
Annual evolution 1998 – 2003	8.9%
Number of train services in 2003	8181
Annual evolution 1998 – 2003	-4.5%

Source: *PTB, 2004*

The waterway passenger share in Dakar is 0.2%. In Dakar, transport by boat is used mainly for travelling to and from the island of Gorée.

Market Share of Transport Modes in Domestic Transport

In the absence of existing studies, the market shares of the different modes of transport have been estimated on the basis of available sources.

The main difficulty concerns road transport. We have used the data derived from the 2002 national survey for road transport figures (*campagne nationale de comptage 2002 AATR/GIC*).

On the basis of the flow of vehicles and seasonal adjustments, the traffic on a “typical day” of the year has been determined to be 4.16 million vehicle-kilometres per day. The traffic accounted for is only interurban traffic (measured at the entrance of cities). This does not include purely urban traffic or traffic from countryside to countryside.

The study also gives us a breakdown of the traffic by category of vehicle.

Vehicle type	%
Passenger cars	38%
Interurban Taxi	17%
Vans / passengers	10%
Vans / transport of goods	8%
Buses	10%
Small lorries	6%
Other Lorries	10%
TOTAL	100%

Source campagne nationale de comptage 2002 AATR/GIC

We have combined this data with indications derived from a 1996 national survey (“enquête origine destination”) regarding the average number of passengers for each category of vehicle, as well as the average load and the rate of return trips with an empty load for transport of goods.

Number of vehicle-km per year, per type of vehicle

Vehicle type	Veh/km per year	average nb passengers	passenger/km per year	average load	ton/km per year
Unit	(million)	passenger	(million)	ton	(million)
Passenger cars	582.2	3.0	1746.7		
Interurban Taxi	261.5	7.0	1830.4		
Vans / passengers	153.5	14.0	2149.6		
Buses	153.5	25.0	3838.6		
Vans / transport of goods	123.1			1.5	184.7
Small lorries	92.7			5.3	486.9
Other Lorries	153.5			6.4	984.6
TOTAL	1520.2		9565.3		1656.2

In spite of the approximations, the results convey the dominance of the road market in Senegal:

- for passengers: **9565** millions passenger/km per year
- for freight : **1656** ton/km

These estimates are used below to compare road transport with the other modes of transport.

It should be noted that the estimate for freight is probably less reliable than the one for passengers – while it is relatively easy to count passengers (passenger vehicles usually travel at full capacity in Senegal and rarely make a return trip empty), the estimate for the average load is a bit more uncertain.

Domestic Passenger Transport, by mode (% of total passenger/km)

Road Passenger Share

→ above 99%

Railway Passenger Share

→ below 0.5%

Waterway Passenger Share

→ **currently not significant**, potentially around 1.5% if and when the service between Dakar and Ziguinchor resumes.

Airways Passenger Share

→ ~ 0.1%

In spite of the uncertainties regarding the assumptions below, a very clear and robust result of the estimates confirms the preponderance of road transport for domestic travel, with a share of the total passenger-km carried above 99%. The domestic share of train travel is approximated at 0.3% (the suburban train- “le petit train bleu” - has not been included, but the statistics for road travel do not include urban traffic either). Air transport share of the domestic passenger market is very small (around 0.1%).

There is currently no significant domestic passenger travel by means of water in the aftermath of the interruption of the service between Dakar and Ziguinchor due to the tragedy of the Joola in 2002. Since the service could resume in the future, we have made an assessment of the share of domestic travel it would represent (about 1.5% on the basis of 2 services per week).

Domestic Rail Passenger Traffic	Number of passengers (1,000)	Average distance (km)	million passenger - km
Long distance	100.5	300	30

Source: SNCS-DTT (values for 2000) for the no. of passenger

Assumptions for average distance based on the following: the maximum distance within Senegal by rail is 640 km (Dakar-Kidira) but there is a significant proportion of traffic between Dakar and Thiès (70km)

Air Passenger Traffic (domestic)	Number of passengers (1,000)	Average distance (km)	million passenger -km
	21	550	12

Source: UN Statistics Division (2000) for no. of domestic passengers

Assumption of average distance based on distances between Dakar and the cities linked by domestic flight (Ziguinchor, Tambacounda, Kolda, Cap Skirring...)

Domestic Port/Waterway passenger	Number of passengers (1,000)	Average distance (km)	million passenger - km
	312	450	140

Assumptions: two services per week on Dakar –Ziguinchor, 1500 passengers on average

Domestic Freight Haulage, by mode (% of total ton/km of domestic freight)

Road Freight Share

→ above 95%

Rail Freight

→ ~ 3%.

Waterway Freight

→ NA

Domestic Air Freight Share (% of domestic freight in ton/km)

→ ~ 0%

Rail:

The domestic rail freight carried in 2000 was 50.6 millions of ton-km (source DTT-SNCS). This would be 3.0% of the “guesstimate” above for road freight. Rail freight has known severe difficulties over the recent years, and was characterized by a very poor quality of service, particularly in terms of reliability and speed.

The recent PPP through a concession for operating the Dakar-Bamako, along with significant new investments in infrastructure and equipment, should logically bring additional traffic, especially in the context of the events in Cote d’Ivoire that have affected the traffic to and from Mali. The Dakar-Bamako route is the logical alternative to supply Mali. Thus, international train freight is set to increase over the next few years. It remains to be seen if domestic freight carriage by rail will also benefit from this trend.

Waterway Freight:

There is no data available regarding waterway freight. Senegal has theoretically nearly 900 km of navigable waterways (mostly the Senegal river, and to a smaller extent part of the Saloum). In practice, the maintenance of the waterways has not always been adequate to ensure navigability (perhaps due to the fact that the limited actual and potential traffic did not seem to justify the cost). As a result, waterway is not a significant mode of domestic freight transport.

Air Freight:

Air is also an insignificant mode of transport for domestic freight. This situation is logical given the small size of the country and its stage of economic development.

The amount of domestic air freight carriage is too small to register on international statistics for air traffic. According to the UN Statistics Division, the total amount of domestic air freight carriage for Senegal is 0 (both international and total air freight carriage are identically 32 million ton-km).

Source: United Nations Statistics Division (data for 2000)

http://unstats.un.org/unsd/cdb/cdb_source_xrxx.asp?source_code=41

Rail : Rail Traffic Density (traffic units/1000 route-km)

→ **550 traffic units/1000 route-km**

Passenger-kilometers [000,000]: 63

Freight ton-km [000,000]: 435

Total Traffic Units (Passenger train-km + freight tonne-km [000,000]): 498

Total route-km: 906 km

Source: World Bank Railways Database – Senegal Country File (data for 1999)

Note: these figures include international traffic and are logically higher than the figures for domestic traffic.

Rail : Length of Multi-Tracked Rail Lines (% of total route-km)

→ **7.7%**

Only the link between Dakar and Thiès (70 km) is double-tracked.

Source: see “Measures Used as Input for Indicators” below

Rail : Rail Service Frequency (passenger train-km/route-km annually)

→ **less than 150 passenger service train annually per route-km**

Rail is not a significant mode of transport for passenger travel, as the only operational passenger service is the Dakar-Bamako line (no passenger service between Saint-Louis and Thiès exists). There are normally two services per week on Dakar-Bamako. The distance between Dakar and Kidira, which is near the border with Mali, is 644 km. Since the round trip train service between Dakar and Bamako normally runs twice a week for 52 weeks of the year, and the total rail network is 906 km, it follows that the theoretical

passenger train service frequency is: $(2*2*52*644)/906 = 147.8$ passenger train-km/route-km. In practice, the service has suffered from frequent interruptions. Thus, the actual frequency is, in reality, significantly lower than the calculated number.

Ports : Seaport Traffic – Containers (TEU)

→ 136,076

Source: UNCTAD (United Nations Conference on Trade and Development) – Review of Maritime Transport, Ch.5, p. 77 (2003)

http://www.unctad.org/en/docs/rmt2003ch5_en.pdf

Ports : Seaport Traffic – General and Bulk Cargo (tons)

→ 50,000 tons

This figure indicates the total amount of cargo excluding containerised freight and oil tankers (general cargo: approximately 2,000 tons; other types of cargo: approximately 49,000 tons)

Source: UNCTAD – Review of Maritime Transport, Annex IIIa, p. 12 (2001)

http://www.unctad.org/en/docs/rmt2001annexes_en.pdf

EFFICIENCY (Cost)

Ports : **Shipping Costs** (CIF/FOB ratio)
→ NA

Rail : **Railway Employee Productivity** (annual output/employee)
→ **339**

Source: Louis Thompson Rail database (data for 1999)

FISCAL COST

Roads : **Road Expenditure as Share of GDP (%)** **→1.1% in 2003**

Road Expenditure : 40.8 GFCFA, GDP 3763 GFCFA
Sources: (see "Measures Used as Input for Indicators")

Roads : **External Funds as Share of Total Road Expenditure (%)** **→52% budgeted (2004-2006)**

It is relatively difficult to estimate the level of external funds in total road expenditure because:

- actual expenditure can substantially differ from budgeted expenditure
- donor participation can significantly differ from year to year, depending on the lifecycle of projects
- road projects are usually completed over a period of several years, leaving possible uncertainties in regards to the year to which the expenditure should be attributed

The estimate presented here is based on the three year budget for public investments (including road investments *and* maintenance) for the years 2004-2006.

Budgeted road expenditure 2004-2006 (GFCFA)

Funding	2004	2005	2006	Total
State	37.7	23.6	7.1	68.3
Donors	32.5	46.1	23.1	101.8
Funding not identified	0.0	3.0	3.6	6.6
Total	70.2	72.7	33.8	176.7

Source: Budget consolidé des investissements

We have made some adjustments to the budgeted expenditure. The first concerns the road fund for 2006 (not included in the document) which should be financed by the state. The second concerns the expenditure by local authorities financed by the municipal development agency (the estimate is based on actual expenditure from 1998 to 2002).

	2004	2005	2006	Total
Adjustments to state			15	15
Local authorities	3	3	3	9

With these corrections, we arrive at the following proportions for internal and external sources of funding:

- Internal: 47.6%
- External: 52.4%

	2004	2005	2006	Total	%
State - local authorities	40.7	26.6	25.1	92.3	47.6%
Donors	32.5	46.1	23.1	101.8	52.4%
Total identified	73.2	72.7	48.2	194.1	100.0%

**Roads : Road Maintenance Effectiveness:
Actual/Required Expenditure (%)
→ 74.5%**

This figure indicates the ratio of expenditure on current road maintenance in 2003 in proportion to the annual budget (the budget level is based on the results of the road network inspections carried out in 2001).

Source: AATR – 'Situation des Marches d'Entretien Courant' (2003)

INSTITUTIONS AND GOVERNANCE

**Roads : National Roads Board (NRB) Exists and Reports
(at least annually) (Y/N)
→ YES**

The National Roads Board (“*Conseil des Routes*”) monitors the activity of the National Road Agency AATR (Agence Autonome des Travaux Routiers).

**Roads : Private Sector Representatives Form Majority of NRB (Y/N)
→ NO**

The “*Conseil des Routes*” is composed of representatives of both the private and public sector, as detailed below:

- representative of the President of the Republic
- representative of the Prime Minister
- representative of the Minister in charge of roads
- representative of the Minister of finance
- representative of the Minister in charge of environmental protection
- representative of road passenger carriers
- representative of road freight carriers
- representative of consumers
- representative of employers
- expert chosen by the Minister in charge of roads.

The members of the National Roads Board are nominated for a renewable period of three years.

**Roads : Main (National) Road Agency operating with Annual Report
Published (Y/N)
→ Operating and producing annual report: Yes
→ Report published: No**

**Roads : Main (National) Road Agency publishing Technical and
Financial Audits (Y/N)
→ Audits carried out (internal + external): Yes
→ Publication of reports: No**

**Roads : National Road Safety Action Plan (Y/N)
→ NO, (but)**

No national action plan for road safety has been prepared to date, but several measures have been taken over the last few years:

- **Institutional:** creation of a ministerial steering committee for road safety, coordinating 5 sectoral technical committees;
- **Regulatory:** adoption of stricter road traffic regulations, including the imposition of a quasi-ban on importation of used cars more than 5 years old;
- **Data Collection and Analysis :** creation of the BAAC (Bulletin d'Analyse des Accidents Corporels) within the Ministry of Transport;
- **Training:** organization of training sessions on road safety for about 6000 professional drivers in addition to preparation of teaching materials and a manual to increase road safety awareness among school children

Roads : Social Assessment of Road Projects Mainstreamed (Y/N)
→ YES

The current three year investment plan has been prepared by assessing individual projects with a set of three categories of criteria (economic, social, reduction of inequalities between regions).

Roads : Environmental Assessment of Road Projects Mainstreamed (Y/N) → YES

All studies carried out to assess road projects now include an environmental assessment. In 2002, the ministry in charge of transport created a specialized team for environmental monitoring, whose activities are coordinated by a national steering committee.

Roads : Communicable Disease Control (Y/N)
→ YES

Several steps have been initiated to fight the spread of HIV-AIDS through the transport sector within the framework of the Second Sectoral Transport Program (PST2), including:

- Sub-sectoral action plans
- Organization of events to increase information and awareness

All : Competitive Private Sector Participation in Transport Services (Y/N)
→ Yes

- The market for urban transport is mostly private and very competitive
- The market for long distance road transport is mostly competitive
- Recent introduction of PPP for rail freight

All : Gender Assessment (Y/N)

→ NO

No requirement to differentiate and take into account the transport needs and impact by gender has been implemented.

All : **Access For All** (Y/N)

→ NO

No requirement to plan and assess the particular transport needs of different segments of the population (people with disabilities, senior citizens, etc.) has been implemented.

All : **Planning Data Disaggregated** (Y/N)

→ NO

Critical information which frequently forms the basis of policy and investment decisions is not usually surveyed in a disaggregated manner that allows impact assessment for various segments of the population (i.e. women/men, young/aged, able bodied/disabled).

All : **Core Labor Standards** (Y/N)

→ NO (indicating the importance of informal labor)

Senegal has adopted the standards developed by the International Labor Organization, such as abolishing forced labor and sexual discrimination and granting workers the right to bargain collectively.

However, a large proportion of the employment in the transport sector is informal. Formal employment is mainly composed of railway employees (the new concessionaire has reduced its workforce to 1500), workers overseeing port activities and the public bus operator DDD (comprised of about 1000 employees).

In 2000, the total formal employment in the transport and telecom sectors was below 6000 people (source: DPS, situation économique du Sénégal ed. 2001). The total employment in the road transport sub-sector alone is obviously much larger in comparison, as can be inferred from the fleet of professional vehicles in Senegal which number around 30,000 lorries, vans and buses in addition to tens of thousands of taxis.

All : **Health and Safety** (Y/N)

→ NO (importance of informal labor)

The workers in the formal sectors legally benefit from the health and safety protections entailed by the labor code and inter-professional agreements (“*conventions collectives*”). The workers in the formal sector also benefit from a system of health insurance in which resources are assured by contributions from employees and employers.

MEASURES USED AS INPUT FOR INDICATORS

Roads : Paved Roads – Total Road Network (km)

→ **4,554 km**

Road Length – Total Road Network (km)

→ **14,615 km**

	Pop. in 1,000	Paved Roads in km	Unpaved in km	Total in km	Road density km per 1,000	Paved Road Density
TOTAL	9803	4554	10057	14611	1.49	0.46
Dakar	2412	293	13	306	0.127	0.122
Thiès	1349	507	486	993	0.736	0.376
Ziguinchor	558	324	729	1053	1.888	0.581
Diourbel	930	206	336	542	0.583	0.221
Saint-Louis	863	671	1422	2093	2.425	0.777
Tambacounda	530	703	3053	3755	7.081	1.325
Kaolack	1128	368	1036	1405	1.245	0.326
Louga	559	590	1104	1694	3.029	1.055
Fatick	639	375	449	824	1.290	0.586
Kolda	835	517	1428	1946	2.331	0.620

Source : AATR

Roads : Total Expenditure on Roads (FCFA)

→ **40.8 billions FCFA in 2003 (maintenance and investments)**

Year	2001	2002	2003
Budget (investment and maintenance)	ND	61.7	67.6
Actual expenditure (state)	38.3	ND	38.7
Expenditure by local authorities	2.5	2.5	2.5
Total expenditure	40.8	NA	41.2

Sources:

- Budget: budget consolidé des investissements
- Actual expenditure: Ministry of Finances, Direction de la Dette et de l'Investissement, no data available for 2002 (due to a change in the software used for monitoring expenditures)
- Expenditure by local authorities: Agence de Développement Municipal

Rail : Rail Length – Total Rail Network (km)

→ **906 km**

The network is composed of :

- the Dakar – Thiès line (70 km)
- the continuation of the Dakar-Bamako line after Thiès (574 km from Thiès to Kidira);
- two branch lines from Guinguinéo to Kaolack (21 km) and from Diourbel to Touba (47 km);
- the Thiès – Saint Louis line (192 km).

Sources: World Bank Railways Database – Sénégal CFR

Water : Total Waterways (km)

→ **897 km**

- 785 km on the Senegal river
- 112 km on the Saloum river

Source: AllRefer Countries – Senegal: Transportation
reference.allrefer.com/world/countries/ *senegal/transportation.html*

Roads : Road Motor Taxes (FCFA)

→ **129 billion FCFA in 2003**

	2001	2002	2003	Sources
License fee	2.6	2.9	3.3	<i>Direction de l'enregistrement</i>
Tax on company cars	0.3	0.4	0.3	<i>Direction de l'enregistrement</i>
Tax on sale of used vehicles	2.3	2.9	4.1	<i>Direction de l'enregistrement</i>
Customs duties and VAT on vehicles and spare parts	27.4	29.6	29.2	<i>Direction des Douanes</i>
Taxes on fuel (inc. VAT)	73.8	79.2	88.5	<i>Comité des Hydrocarbures</i>
Tax on insurance premiums (10%)	1.4	1.6	1.7	<i>Insurers Federation</i>
Misc.	1.9	1.9	1.9	<i>DTT</i>
TOTAL	109.7	118.5	129.0	

All : Total Population

→ **9.8 million** (as of July 2001)

Region	Population (in 1,000)	%	Land area (in km ²)	Population density (inh/km ²)	aver. Growth 1988-2001
Dakar	2412	24.6%	550	4384.6	3.69%
Ziguinchor	558	5.7%	7339	76.0	2.57%
Diourbel	930	9.5%	4359	213.4	3.11%
Saint - Louis	863	8.8%	44127	19.6	2.05%
Tambacounda	530	5.4%	59602	8.9	2.43%

Kaolack	1128	11.5%	16010	70.5	2.52%
Thiès	1349	13.8%	6601	204.3	2.75%
Louga	559	5.7%	29188	19.2	1.00%
Fatick	639	6.5%	7930	80.6	1.72%
Kolda	835	8.5%	21011	40	2.63%
Total	9803	100%	196717	49.8	2.69%

Source : DPS (population in July 2001)

Urban : Urban Population (% - 2002)

→ **49%**

Source : World Bank Country Data – “Senegal at a Glance” (2003)

Note: the household survey of 2001 gives a lower proportion for urban population (41%), which is probably based on a different definition.

Rural : Rural Population (% - 2002)

→ **51%**

Source : World Bank Country Data – “Senegal at a Glance” (2003)

All : Surface Area of Country

→ **196,700 km²**

Source: World Bank – World Development Indicators database (April 2004)

All : GDP (billions of FCFA)

→ **3,763 billions FCFA** (2003)

(Billions of FCFA)

Year	2000	2001	2002	2003	2004 (f)
GDP	3114	3380	3511	3763	4041

Source: UEMOA Statistics (2004)