REPUBLIQUE DU CAMEROON
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TRAFFIC STUDY ON THE EBOLOWA-AKOM II – KRIBI ROAD SECTION
INTERIM REPORT

MINISTÈRE DES TRAVAUX PUBLICS
MINISTRY OF PUBLIC WORKS

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SUMMARY

The traffic study on the Ebolowa - Akom II - Kribi road, which aims to highlight traffic forecasts on this road, was carried out in three phases. The first phase was dedicated to documentary research, the second phase to data collection and field surveys and the third phase to data processing and the elaboration of this report.

Data collection made it possible to (i) gather a number of reports and documents relevant to the mission, (ii) carry out the traffic count and Origin/Destination survey, (iii) transport survey and (iv) evaluate travel times in a non-project situation during the dry season. This phase ran from 07/02/2024 to 18/02/2024.

The traffic history obtained from the Ministry of Public Works gives us a traffic of 287 veh/d in 2019 between Ebolowa and Kribi with the counting station installed at Ebolowa. The Integrated Multimodal Transport Infrastructure Strategy study counted traffic of 787 veh/d on the Kribi - Ebolowa section, with the counting station installed at Kribi.

The average traffic counted during the week was 160 veh/d on Ebolowa-Akom II, excluding motorcycles, which account for the lion's share of this traffic. On Akom II - Kribi, traffic counted during the survey period gives a daily average of 423 veh/d.

For the O/D surveys carried out at Mengong, the main origins of travellers are Ebolowa (42%), Sangmelima (33%) and Mengong (14%). Douala and Yaoundé each account for 3% of Origins. The main destinations of travelers are Sangmelima (53%) and Ebolowa (31%). Yaoundé accounts for 4% of destinations.
The main origins of goods are Sangmelima (52%), Ebolowa (19%), Mengong and Djoum (11% each). The main destinations are Ebolowa (41%), Sangmelima (26%) and Mengong (22%). Construction materials account for 33% of goods, while logs represent 15%.

Surveys of passenger transporters show that many of them have abandoned the Ebolowa-Akom II-Kribi line due to its impassability in rainy weather, and are ready to restart it if the road is asphalted.
The estimate of diverted traffic was based on O/D surveys and counting carried out in 2018 as part of the development of the Integrated Strategy for Multimodal Transport Infrastructures (S2ITM). It shows that, in 2018, traffic to and from the South region and neighbouring countries that could be diverted along the route would be 232 veh/d.

On entry into service in 2027, the projected Average Annual Daily Traffic (AADT) by road section and direction is shown in the tables below:

AADT by direction and type of vehicle on the Ebolowa - Akom II section

DIRECTION	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL without Moto cycle	Total heavy vehicule (HV)
From Ebolowa to Akom II	151	72	23	3	35	31	14	100	430	184
From Akom II to Ebolowa	176	73	19	3	39	91	25	12	438	170
Twoo Directions	**327**	**145**	**42**	**7**	**74**	**122**	**39**	**112**	**869**	**354**

AADT by direction and vehicle type on the Akom II - Kribi section

DIRECTION	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL without Moto cycle	Total heavy vehicule (HV)
From Akom II to Kribi	112	92	24	5	34	42	68	99	476	248
From Kribi to Akom II	142	103	21	4	31	96	73	2	471	206
Twoo Directions	**254**	**195**	**45**	**9**	**66**	**137**	**142**	**101**	**947**	**454**

INTRODUCTION

The project to asphalt the Ebolowa - Akom II - Kribi road (RN17) represents a major challenge in terms of serving the hinterland of the port of Kribi on one hand and opening up the area directly impacted by the project on the other. The company ICM SPA has been entrusted with the work on this road and has contacted Egis Cameroun to carry out a study aimed at forecasting traffic on this road in order to provide the basic data needed to assess current and future traffic levels and characteristics.

The service includes three main activities namely:

- The collection and analysis of existing data and information.
- Carrying out field surveys (simple traffic counts and/or Origin/Destination surveys).
- Analysis of identified and forecast traffic.

This report is structured around the following points:

- Study methodology ;
- Area of direct impact of the project;
- Traffic history;
- Carrying out the traffic count, O/D survey and transport surveys;
- Traffic forecast.

1 - STUDY METHODOLOGY

The methodology used to conduct the study focused on two main areas: documentary research and data collection in the field.

1.1 Documentary research

Documents and reports relevant to the study were collected from different Minstries and governemental organisations. The main targets were: the Ministry of Public Works for traffic studies and other reports on road strategic study, the Ministry of Transport for transport statistics for hinterland countries and logistics projects (dry ports), the Ministry of Mines, Industry and Technological Development, Cameroon Mining Company (CMC) for mineral transport.

Egis itself made a significant contribution by providing us with reports from their database.

The survey and interview forms are attached.

1.2 Field data collection

Data collection in the field began with meetings with the authorities, followed by the actual surveys.

1.1.1 Meetings with administrative autorities

As soon as we arrived on the field on Wednesday 07/02/2024, the team made contact with the administrative authorities of the Mvila division and with the sectoral managers of the region, in order to present the purpose of our mission and request the authorisations required to carry out the surveys of transporters and the O/D surveys, which requires the intervention of the forces of law and order.

Unfortunately, this period coincided with the installation of the new Divisional Officer of Mvila, and most of the officials were mobilised around this event. Moreover, Monday 12/02/2024 was a public holiday.

After several visits to the first deputy of the Divisional Officer, the message attached to this report was signed on 15/02/2024.

In Kribi, the investigators went to the transporters with the discharge of the letter submitted to the Sub-divisional Officer due to the unavailability of the officials to duly notify the stakeholders. A copy of the discharge is also attached.

1.1.2 Carrying out the traffic count, O/D surveys and transport surveys

The traffic count and O/D survey campaign organised made it possible to determine the current traffic on the sections selected, as well as the main origins and destinations of

vehicles. Following the visit of the site, the locations for the counting stations were determined.
The transport surveys were carried out using survey sheets and interview sheets.

1.1.2.1 Carrying out of the traffic count and the O/D survey

1.1.2.1.1 Location of counting stations

The number, location and layout of counting stations depend essentially on:

- The problem to be solved;
- The configuration of the road to be studied;
- And the available budget.

Taking all this into account, the site recognition visit identified three (03) counting stations and their locations. These stations are located on the sections considered to be homogeneous in terms of traffic :

- Ebolowa (Azem);
- Mengong (Koungoulou);
- Kribi (Lendi);

TABLE 1: LOCATION OF COUNTING AND O/D SURVEY STATIONS

N°	Road Section	Nature of counting station	Location
1	Ebolowa – Akom II	CC	Azem (1,9 km from custum junction PK0 of the road)
2	Mengong - Sangmelima	CC and O/D	Kougoulou
3	Akom II-Kribi	CC	Lendi

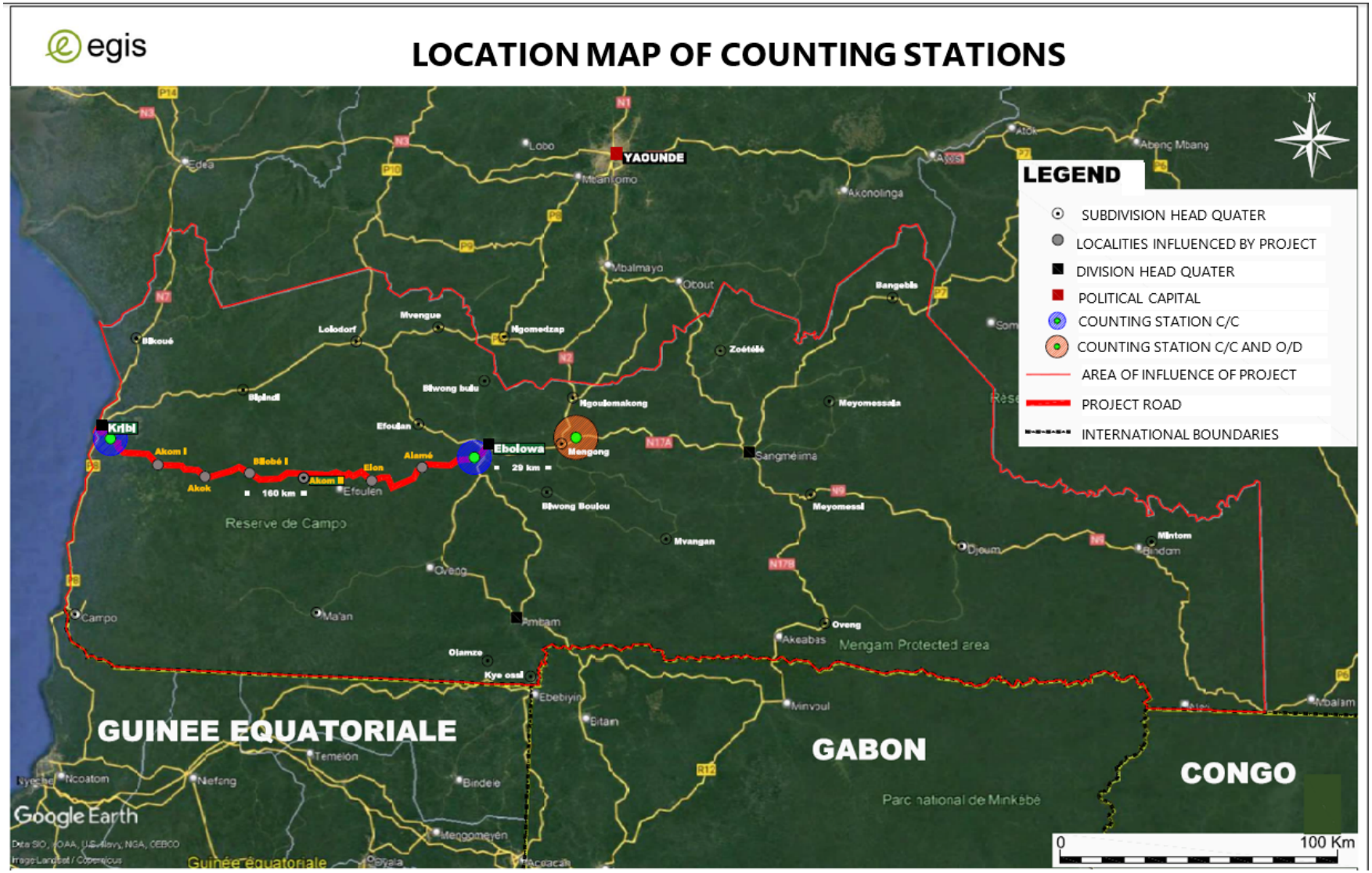


FIGURE 1: LOCATION MAP OF COUNTING STATIONS

1.1.2.1.2 Duration of the counts

The teams were mobilised on the field from Wednesday 07/02/2024. The actual count took place from Monday 12/02/2024 to Sunday 18/02/2024. In view of the schedule constraints of the administrative authorities, the team did not obtain from the administrative authorities the letters to introduce them to the transporters on one hand and on the other hand for the mobilisation of the forces of law and order required to carry out the O/D surveys before Friday 16/02/2024. For this reason, the O/D survey took place from 16 to 18/02/2024. This reduction in the duration of the O/D survey does not significantly impact the quality of the results, which are used in terms of the percentage applied to the traffic that was actually counted during the 7 days.
During the site visit, the interviewers were recruited and trained by supervisors from Yaoundé. The breakdown of interviewers by post is shown below (see Table 3).

1.1.2.1.3 Vehicules categories

The definition of the categories of vehicles to be counted sometimes poses a problem. The tendency is often to want to count all kinds of vehicles using the route, but this leads to many constraints when processing the results. To avoid these constraints, only the vehicle categories used by Ministry of Public Works in the annual counts it organises are used here. This grouping gives the following nine (9) categories:

TABLE 2: CATEGORY OF THE VEHICULES TAKEN INTO ACCOUNT

1	Motocycles (MO)	4	Minibus (MB)	7	3 Axles Truck (C3E)
2	Personnal vehicule (VP)	5	Autocar (AC)	8	More than 3 Axles truck (EA)
3	Pick-up (PU)	6	2 Axles Truck (C2E)	9	Logging Truck (Gru)

1.1.2.1.4 Organisation of the traffic count and O/D survey

The surveyors are distributed over the various sections at the rate of 04 surveyors per single counting station on the current section. A counting station is installed on each homogeneous section. Two surveyors work at the same time for a period of eight hours before being relieved by the other two. They record the vehicles on specially prepared sheets.

The supervisors are responsible for ensuring that the work runs smoothly and that the investigators are supervised. They also look after the administrative aspects of the operation. At the end of the operation, they are responsible for collecting the count sheets and returning them to the consultant.

The O/D surveyors are 4 in number and are organised into 2 teams working between 6 a.m. and 6 p.m., taking turns in pairs. Each team is supported by the forces of law and order mobilised from 14 to 18/02/2024.

TABLE 3: LIST OF SUPERVISORS AND INVESTIGATORS

Counting AND O/D StationS	Nr,	NAME	ID CARD Number	Phone
SUPERVISORS				
Ebolowa et Mengong	1	NGAH ATANGANA Christine Crescence		699 96 93 78
Kribi	2	Corsi Manga Michèle Germaine		656 77 09 52
INVESTIGATORS				
Ebolowa (Azem) (CC)	1	Olama Atangana Stève	500215822	659849224
	2	AFOM SANDRINE	KIT 232	658621832
	3	Zeh MFom Etienne Brice	KIT 512	659849224
	4	Assom Jordan	S/C 50022582	697083590
Mengong (CC)	1	Bekono Yves	000285321	65822809
	2	Beyale Zouam Martine	KIT 232	657934236
	3	Ondoua Bingono David	S/C KIT 126	658823970
	4	Abomo Séraphine	KIT 126	659494421
Mengong (O/D)	1	Danra Howe David	117534241	698480086
	2	Okole Tsanga Marie	101589771	698120067
	3	Meke Meka Steeven Sam	KIT 512	696943326
	4	Bekolo Yves	101314825	657794143
KRIBI (Lendi) CC	1	Bikanda Cyrille	KIT 20180510077110994	658450911
	2	Ngoundi Simava Suo	KIT03068L5LN380ZYJO	69555745
	3	Asso'o regine	2017074335590334	655915559
	4	Ngouo Bikanda Klyd	118517808	695977140

1.1.2.1.5 Processing the results

The counting and O/D survey results are processed using the excel spreadsheet designed for this purpose by the Ministry of Public Works.

1.1.2.2 Carrying out surveys and interviews with transporters

After the recruitment and training of interviewers during the site visit period, the interviewers were divided into two teams of two people each : one team was responsible for the Ebolowa area and the other for the Kribi area.

Using data collection and interview forms, informations are collected from Transporters, logisticians and any other operators whose activities may have an impact on the road project.

TABLE 4: LIST OF TRANSPORT INVESTIGATORS

Area	N°	Name and first names	CNI	Contact
Ebolowa	1	Monti dalya		693947692
	2	Menye Bikom Régine jorelle	175215J781EOMNK84	659863429
Kribi	1	Bomba Ebanga Joseph	Kit 396	670416338
	2	Obamena Claire	Kit068	694303640

1.1.2.3 Travel time between Ebolowa and KRIBI

The Travel time between Ebolowa and Kribi was recorded using the Prado car made available for the mission. This work was carried out on a one-way basis, separating the journey into two sections, Section I : Ebolowa - Akom II; Section II : Akom II - Kribi. The car was driven normally, depending on the level of deterioration of the road, and the journey time was recorded for each section, which was homogeneous in terms of condition.

Adjacent roads carrying traffic were also identified as well as any other special events.

1.1.3 Logistic resources made available

Two PRADO cars were mobilised for the mission, including drivers and fuel. Chasubles and small counting equipment (umbrellas, clipboard, folders, pen, torch, watch, etc.) were purchased and counting and survey sheets were multiplied.

2 PROJECT IMPACT AREA

2.1 Criteria for determining the impact area

The usual criteria for determining the area of influence of a road development project are essentially linked to the potential use of the future road by users from nearby areas. These users may be limited to direct residents within a district (in the case of a rural road). However, the project may also serve users from several districts (in the case of a departmental road) or from several division or regions (in the case of a régional or national road). In general, the administrative district or districts served or likely to be served by the project constitute its area of influence. The area of influence is direct when the project affects the administrative units of impact more or less directly. It is extended to neighbouring areas when the project affects them indirectly, through other roads.

The Ebolowa - Kribi road and the Mengong - Sangmélima bypass are located in the South Region of Cameroon.
They pass directly through the following divisions
- Océan Division (headquarter Kribi),
- Mvila Division (headquarter Ebolowa)

They link these two divisions to the Ntem Valley division (capital Ambam), mainly via the Ebolowa - Ambam tarmac road and the Nkong - Nden dirt road.

The four divisions that make up the Southern Administrative Region (capital Ebolowa) constitute the project's direct area of influence.

However, the impact Area of this road development project extends beyond the Southern Region. In Cameroon, the project has an indirect impact on the following localities
- The Littoral (mainly the Sanaga Maritime and Wouri divisions),
- In the Center (Nyong et Kelle and Nyong et So'o Divisions etc...)
- In the East (Haut-Nyong, Boumba and Ngoko Divisions).

In addition, located on a sub-regional transit corridor (CEMAC), the project mainly influences
- The north of the Republic of Equatorial Guinea (via Ebebiyin),
- Northern Gabon (via Bitam and Minvoul),
- Northern Congo (via Souanké).

Despite the extent of the project's indirect Area of influence, the developments that follow essentially concern the project's direct impact Area shown in Figure 2 below

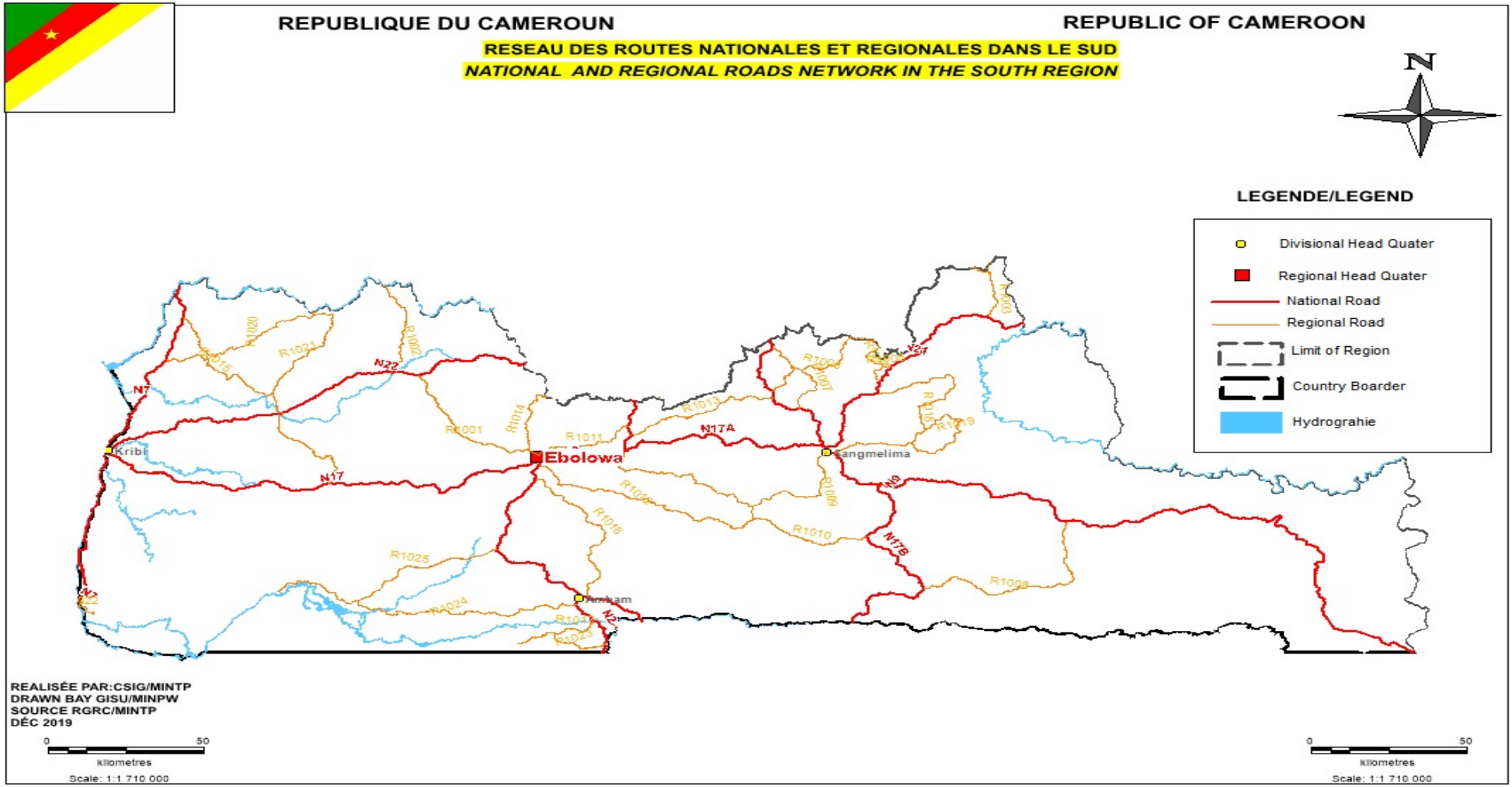


FIGURE 2 : DIRECT IMPACT AREA OF THE PROJECT

2.2 Physical characteristics of the area of influence

The physical characteristics of the project's area of influence can be summarised as follows.

2.2.1 Road network

According to Ministry of Public Works' statistics, the southern region has 1,365 km of national roads, 717 km of which are asphalted, and 1,272 km of regional roads, 174 km of which are also asphalted. For the national roads, 52.3% were in good condition in 2022, 27.7% in average condition and 28.2% in poor condition. For the regional roads, 60.4% were in poor condition, with only 19.1% in good condition.

The Ebolowa-Akom II Kribi road, which is classified as the N17, was maintained in sections with stony sections at the time of the surveys and its overall condition can be described as average.

2.2.2 Vegetation

In terms of vegetation cover, the South region is located in the dense equatorial rainforest area. The coastal strip consists of mangrove swamps, the hinterland is covered by dense forest, rich in various species (iroco, tali, movinguia, moabi, fromager, ilomba, etc.).

2.2.3 Relief

The relief of the area of influence is dominated by low plateaux, the Southern Cameroon plateau, with an average altitude of 600 metres. However, the coastal strip is flat, with altitudes ranging from 0 to 300 metres. The highlands, on the other hand, are represented by the Ntem massifs and the Ngovayang mountain range (1,043 m).

2.2.4 Climate

The climate is equatorial, with 4 seasons: two rainy seasons (March to June and September to November) and two dry seasons (November to February and July to August). The average rainfall is 1,800 mm per year over 160 to 170 days. Temperatures vary between 18° and 31° and are moderate.

2.2.5 Hydrography

The hydrographic network of the South region is made up of two major basins:
- The Atlantic Ocean basin, with the main rivers being
    - The So'o, which rises near Sangmelima and is a tributary of the Nyong,
    - The lower Nyong,

- The Ntem, which originates in Gabon and whose main tributaries are the Mboro and the Mvila, as well as the Njo'o, the Biwoume and the Kom,
- The Lokoundjé and its main tributaries the Mougué and Tchangue,
- The Lobe and its tributary Niété
- The Kienké, which flows into the Atlantic at Kribi.

- The Congo basin, comprising
  - The River Dja, which rises south-east of Abong-Mbang, flows westwards and then south and south-east before reaching the Congo basin. Its tributaries are the Momo, Lobo and Saba rivers,
  - The River Ayina, which rises in Gabon and has the Lélé and Koumou as tributaries.

2.3 Underground resources

The underground in the project's area of influence contains significant mineral resources (gas, limestone) that have not yet been exploited or are in the process of being exploited. Researches are underway to determine the extent of these resources.

- **Oil and natural gas** in the Ocean department of Campo, Eboundja, Kribi and the Elogbatindi region;
- **Iron** in the Mamelles massif, in the Zingui and Akom II regions, and at Mbalam,
- **White bauxite** in the *Monts des Eléphants*,
- **Gold** at Abiété and Mvié,
- **Limestone** at Mintom and in the Campo region,
- **Platinum** at Nkongmekak by Akom II,
- **Rutile and uranium** at Djoum,
- **Ilmenite** at Londji, Eboundja and Bouandjo.

Researches are currently being carried out by companies specialised in mining researches, with the objective of delimiting the deposits and determining the importance of the minerals. They include :
- CAMINEX for gold, uranium, platinum and iron;
- New Energy Corporation for gold, uranium, copper and lead;
- SICAMINES for syelite, rutile and ilmenite;
- CAGEME for limestone, particularly in the Mintom region,
- SINOSTEELCAM for Kribi iron.

With regard to the exploitation of the Mbalam iron ore, which is a world-class deposit spread between Cameroon (Mbalam) and Congo (Nabeba), the operating licence for the said iron ore deposit was signed in 2022 with the Cameroon Mining Company (CMC). This mining project includes the construction of related infrastructure, in particular a 510km railway line linking the Mbalam mine to the Kribi Autonomous Port and the Kribi mineral terminal.

2.4 Constraints and strengths

In physical terms, the dense vegetation cover of the southern region is a constraint to road construction and the creation of plantations (significant deforestation).

On the other hand, the long coastline, the rich underground, the variety of forest species and the moderate climate are assets for fishing, the fish industry, the mining industry, forestry and agriculture.

2.5 Demography of the area of direct influence

According to BUCREP projections, the population of the Southern Region would be 783,561 in 2020. The main characteristics are as follows

- A predominantly male population, with a sex ratio of 1.04;
- A predominantly rural population, with an urbanisation rate of 38.8%, below the national average of 52%;
- A fairly low population density of 14.7 inhabitants per km^2, below the national average (41.6);
- A very young population, with an average age of 25.1 and a median age of 20;

The table below shows population trends in the South region, based on a constant rate projection by BUCREP.

TABLE 5: POPULATION CHANGE IN THE DIRECT IMPACT AREA BETWEEN 2016 ET 2020

Administrative Unit	2016	2017	2018	2019	2020
South Région	**757 739**	**765 234**	**772 036**	**778 145**	**783 561**
Dja et lobo	235 148	237 473	239 583	241 482	243 161
Mvila	214 226	216 345	218 270	219 995	221 528
Océan	213 826	215 942	217 861	219 584	221 111
Vallée du Ntem	94 539	95 474	96 322	97 084	97 761

Source : BUCREP 2017

2.6 Economic data for the area of direct influence

The productive sector of the South region is characterised by the predominance of the rural sector (agriculture and forestry).

2.6.1 Agriculture

Agriculture is the main economic activity in the project's area of influence. It is practised mainly by rural populations through family farms and by a few agro-industrial companies.

In terms of exploitable area and amout produced, cassava is the main food crop, followed by cocyam, banana and plantain. Other food crops include maize, groundnuts, beans, potatoes, sugar cane and palm oil.

The modern agricultural production system is essentially represented by two agro-industrial companies, HEVECAM and SOCAPALM.

However, in private plantations, particularly those at Mvomeka'a in Dja and Lobo, mixed farming of cash crops, food crops and vegetables is practised.

2.6.2 Logging/Forestry exploitation

Logging is well developed in the project's area of influence. Licenced areas sum up to 120,000 ha. Logging areas are increasing significantly, especially with the arrival of the Ntem Valley and the districts of Djoum and Oveng on the logging scene. Logging is carried out both small-scale and industrial basis.

Industrial logging is carried out by approved companies. Forest Management Units (FMU) are granted to them for exploitation. Several companies operate FMUs in the Southern Region, including :
- SCIEB (concession 1011), CUF (1081), Ets EFFA (1082, MMG World (1028) in the Ocean,
- FIPCAM (concession 1050) in Mvila,
- CUF (concession 1069), WIJMA (1037) and (1006) in the Ntem Valley,
- LOREMA (concession 1032, MPACKO J.P (1073), GEC (1080), SIBM (1079) in the Dja and Lobo.

The map below illustrates deforestation in Cameroon in general and in the Southern region in particular.

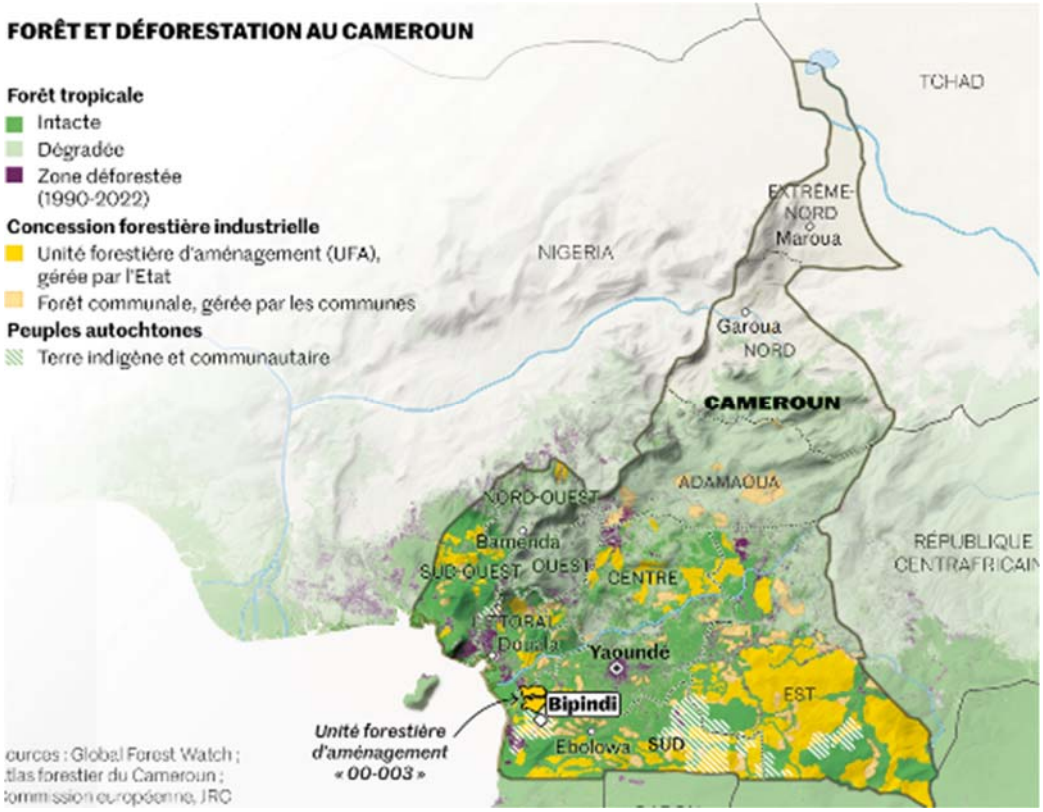


FIGURE 3 : FOREST AND DÉFORESTATION IN CAMEROON

2.6.3 Livestock farming and fishery

Livestock farming is not a favoured activity in the project's area of influence. It is essentially limited to sheep, pigs, goats and poultry.
Two forms of fishing are practised in the southern region: sea fishing and inland fishing.

2.6.4 Tourism

Tourism is an important activity in the project's area of influence. There is a great potential.

Several sites can be found along the Province's 150 km of coastline. Developed beaches include
- Londji beach (22 km on the Kribi - Edéa road),
- Ebodie village beach (24 km from Campo),
- Campo Beach (4 km from Campo)
- Ebandja beach (22 km from Kribi on the Kribi - Campo road)
- Ebomé beach,
- Grand Batanga beach,
- Ngoye Beach

The table below shows the other touristic sites by department.

TABLE 6: TOURISTIC SITES BY DIVISION AND TYPE IN THE SOUTH REGION				
Division	**No**	**Name**	**Characteristics**	**Location**
OCEAN	1	Lobé waterfalls	River flowing into the sea through waterfalls	7 km from Kribi to Campo
	2	Londji Beach	Acute point in the Gulf of Guinea	14 km from Kribi to Edéa
	3	Ebodjé village	Ecotourism village adapted to protect sea turtles	50 km from Kribi in the Campo district
	4	Campo Beach	The mouth of the Ntem, spectacular at sunset	4 km south from the town of campo
	5	Campo Park	A reserve rich in plant and animal species	Campo and Ma'an district
	6	Lobé Pygmy Camps	Curators of authentic culture	Along the river Lobé 7 km towards Campo
	7	Mankouré camp	Authentic culture	30 km from Kribi to Lolodorf
	8	Bidjonka Falls	Tourist centre with a 100 m high waterfall	80 km from Kribi on the Lolodorf road
	9	Dipikar Island	Remains of German colonisation	On the River Ntem at Campo
	10	Elephant Mountain	View of the sea, extraction of decorative stones	12 km de Kribi vers Akom II
	11	The landing stage	Fish market	Kribi Centre
	12	Mount Bidou I	Christian pilgrimage site	25km from Kribi on the Lolodorf road
	13	The golf club	9-hole private golf course	5 km north from Kribi
	14	Lokoundje Falls	Tourist centre	In the LOKOUNDJE village on the Kribi-Edéa road
	15	BIKILI camp	Authentic culture	A30km on the Kribi-Lolodorf road
	16	Ebandja Beach	Tourist centre	22 km from Kribi on the Kribi-Campo road
	17	Ngovayang Catholic Mission and Hospital	Tourist centre	16km from Lolodorf
	18	The Campo mammary massif	Spectacular rocky massif	At Campo on the Kribi-Campo road
	19	Le rocher du Loup	Spectacular rocky massif	A wolf on the Kribi-Campo road
	20	Mpalla Hill	Tourist area	At Mpalla 11km, on the Kribi-Edéa road
Mvila	1	Grotte de Nkolandom	Centre touristique avec des grottes historiques	18 km d'Ebolowa vers Ambam par Mekomo
	2	Ako'o Kass	Massif rocheux spectaculaire	30km d'Ebolowa vers ambam par Mekomo
	3	Akok Beniat	Rocher attirant les buffles	Mvangan 50 km d'Ebolowa par Biwong Bulu
	4	Grottes de Nkoleyeng	Grottes historiques	30 km d'Ebolowa vers Akom II
	5	Mont Ebole wo'o	Propice pour l'alpinisme et les pèlerinages religieux	Dans la ville d'Ebolowa

TABLE 6: TOURISTIC SITES BY DIVISION AND TYPE IN THE SOUTH REGION				
Division	**No**	**Name**	**Characteristics**	**Location**
	6	Mbil bekon	Rivière souterraine	18km d'Ebolowa sur la route d'Enongal
	7	Sanctuaire à gorilles	Réserve à forte colonie de gorilles	A Oveng par Mvangan
VALLEE DU NTEM	1	Chutes de Memvele	Trois chutes spectaculaires possédant un champ magnétique	A Ma'an
	2	Marché de Kye –ossi	Marché frontalier	A 37km d'Ambam
	3	Le site de Meyo Ntem	Centre touristique	Les trois bras du NTEM près de Ma'an
DJA ET LOBO	1	Rocher de Mezesse	Succession de massifs rocheux	30 km de Sangmélima vers Meyonmessala
	2	Rocher de Meyom adjom	Vision sur la ville de Sangmelima	25 km de sangmélima vers Meyomadjom
	3	La réserve du Dja	Patrimoine de l'humanité par l'UNESCO	Partagée entre les provinces du Sud et de l'Est
	4	La plage de Mekin	Confluence de trois rivières, le Dja, le Lobo et le Sabe	A Meyomessala
	5	Complexe Rock Farm	Complexe agro tourisque	A Meyomessala
	6	Le Rocher d'Akoa Fim	Zone touristique	À Akoa sur la route Djoum-Oveng

Source : MINTOUL

3 TRAFFIC HISTORY

The Ministry of Public Works regularly organises traffic survey campaigns to provide reliable data for road studies and program the maintenance and rehabilitation work on the road network. Documentary researches have enabled us to identify the traffic on the following road sections:

3.1 Traffic history on EBOLOWA - KRIBI

The table below gives the traffic history on Ebolowa-Kribi. The counting station at which the counts were carried out is located on the Ebolowa side. The results obtained at this station have therefore been extrapolated over this entire section of road, which is approximately 170 km long. This extrapolation is biaised because it does not take into account the existence between the two departmental capitals of major conurbations such as Akom II, or traffic from other adjacent roads that do not reach Ebolowa.

Between 2000 and 2019, traffic on this section rose from 89 veh/d to 287 veh/d, an increase of 222% in 20 years. The trend was almost stagnant until 2011, but from 2013 a spectacular peak was observed. This spike could be explained by renewed interest in logging in the area, with the ensuing knock-on effects.

TABLE 7: AVERAGE ANNUAL DAILY TRAFFIC ON EBOLOWA –KRIBI BETWEEN 2000 ET 2019

Year	VP	Pick Up	Minibus	Autocars	C 2E	C 3E	E Art	Gru	TOTAL
2000									88,9
2001									92,3
2002	23,2	26,0	11,2	0,1	6,5	6,7	2,0	5,7	81,3
2003	30,7	29,0	22,9	0,0	5,6	3,7	1,7	4,7	98,3
2004	13,0	20,6	19,2	0,1	2,4	6,7	0,4	7,2	69,6
2005	33,3	27,9	21,9	0,5	7,1	6,3	1,6	21,8	120,2
2007	35,1	32,7	11,5	0,0	3,3	9,8	0,0	2,7	95,1
2011	44,0	24,0	11,0	0,0	2,0	6,0	1,0	7,0	94,0
2013	102,5	50,0	17,1	0,0	11,8	25,6	4,6	28,1	239,6
2016	116,4	53,9	22,2	0,3	19,4	9,3	5,4	20,7	247,6
2017	107,6	43,9	19,7	1,6	12,9	7,2	0,4	8,7	202,1
2019	171,5	61,9	16,9	1,0	17,5	8,7	0,7	8,7	287,1

Source : Rapports étude de trafic MINISTRY OF PUBLIC WORKS et compilation du consultant

3.2 Traffic history on KRIBI-CAMPO

On the Kribi-Campo section, the data collected between 2011 and 2019 shows an upward trend, which accelerated in 2013. From 164 veh/d in 2011, the figure has risen to 813 veh/d in 2019, an increase of 400% in 8 years. This increase is also due to the exploitation of the Kribi Autonomous Port (KAP), which generates significant traffic. The table below shows traffic by type of silhouette between Kribi and Campo from 2011 to 2019.

TABLE 8: TRAFFIC ON KRIBI-CAMPO BETWEEN 2011 AND 2019

Year	VP	Pick Up	Minibus	Autocars	C 2E	C 3E	E Art	Gru	TOTAL
2011	102,0	41,0	2,0	0,0	6,0	8,0	2,0	3,0	164,0
2013	257,6	213,3	45,1	2,0	60,3	205,8	27,4	11,9	823,3
2016	171,2	136,0	11,9	2,7	26,2	13,2	17,5	10,0	388,7
2017	416,5	223,0	19,4	12,0	31,4	95,5	212,4	5,8	1015,9
2019	320,7	200,6	61,5	15,8	57,3	52,5	82,0	23,4	813,7

Source : Rapports étude de trafic MINISTRY OF PUBLIC WORKS and consultant's compilation

3.3 Traffic history on Mengong-Sangmelima

On Mengong-Sangmelima, traffic has risen from 155 veh/d in 2011 to 177 veh/d in 2019, an increase of 22 veh/d in 8 years. The increase has not been as exponential as on previous sections, even though the peak observed in 2013 remains unchanged.

TABLE 9: TRAFFIC ON MENGONG-SANGMELIMA BETWEEN 2011 AND 2019

Année	VP	Pick Up	Minibus	Autocars	C 2E	C 3E	E Art	Gru	TOTAL
2011	86,0	30,0	24,0	0,0	13,0	1,0	1,0	0,0	155,0
2013	124,9	85,5	58,2	7,2	42,6	28,4	18,8	37,8	403,4
2016	75,1	35,7	10,3	0,2	2,8	1,1	0,2	0,0	125,3
2017	55,7	20,9	6,5	0,1	3,5	1,8	0,0	0,4	88,8
2019	78,5	65,0	9,1	1,0	11,1	9,7	1,3	1,0	176,6

Source : Rapports étude de trafic MINISTRY OF PUBLIC WORKS and consultant's compilation

3.4 Traffic study carried out as part of the Integrated Multimodal Transport Infrastructure Strategy S2ITM May 2018

The traffic study carried out as part of the Integrated Strategy for Multimodal Transport Infrastructures (S2ITM) was conducted throughout the country. This study installed a counting station in Kribi on the Kribi-Campo section (Station No. 4 on the N7) and a station on the Kribi Akom II section (Station No. 5 on the N17).

Unlike the studies carried out by Ministry of Public Works' technical bureaus, S2ITM's traffic study included motorcycles and broke down private cars into three categories (clando + private car + taxi). To compare the results with those of Ministry of Public Works, we have combined the three categories of private vehicles.

TABLE 10: TRAFFIC ON KRIBI-AKOM II AND KRIBI-CAMPO IN 2018

MO	VP	P U	Mb	AC	C 2E	C 3E	E Art	Gru	TOTAL excuding Bikes	Total including Bikes
Ebolowa - KRIBI post 5										
1261	338	180	37	0	67	51	37	77	**787**	**2048**
Kribi Campo Poste 4										
150	31	47	1	0	19	20	7	6	**281**	**131**

Source: Activity 2.1: Summary report on data collected and obtained after surveys (S2ITM)

It appears that the traffic results obtained on the Ebolowa - Kribi section are very different depending on whether the counting station is located in Ebolowa or Kribi

To correct this biais, the traffic study referred to in this report set up a counting station in Kribi (Lendi) to count the Akom II - Kribi section and a station in Ebolowa (Azem) to count the Ebolowa - Akom II section in order to have fairly homogenous sections in terms of traffic.

FIGURE 4 : TRAFFIC COUNTING STATION AND O/D SURVEY STATIONS IN 2024 AND 2018

4 TRAFFIC COUNT AND FIELD SURVEYS

4.1 Unfolding of the operations

4.1.1 Conducting the traffic count

In accordance with the methodology described above, traffic counts were carried out at the three stations (Ebolowa, Mengong, Kribi) from Monday 12/02/2024 to Sunday 18/02/2024. The count sheets were filled in by time, slot and by direction of traffic, distinguishing the type of vehicle each time.
For each counting station, 128 cards were used to record the traffic, including 112 cards for the daytime count (6am-10pm) and 16 cards for the two night-time counts (Tuesday night to Wednesday and Saturday night to Sunday).

The supervisors made the rounds each day to ensure that the operation was running smoothly.

Some photographs of the counting operations.

Dayly Counting at Kribi station

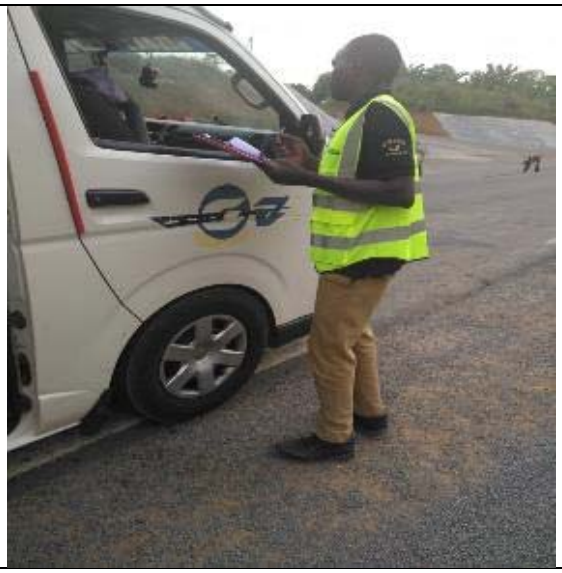
Counting during the Nigth at Kribi statin

Figure 5 : Traffic counting at Kribi (Lendi) counting station

4.1.2 Conducting the O/D survey

With the help of the law enforcement agencies, the Origin/Destination survey took place over three days (for the reasons given above) from Friday 16/02/2024 to Sunday 18/02/2024 at the Mengong station (Kougoulou). The 4 investigators worked in two teams of two people per team each day from 6am to 6pm for security reasons.

Several survey forms were administered, including passenger O/D forms and goods O/D forms.



O/D Survey

Figure 6 : O/D survey at Mengong (Kougoulou) O/D survey station

4.1.3 Transport Survey

Surveys of transporters made it possible to administer several questionnaires in the Kribi area and in the Ebolowa area. It emerged that in the Kribi area, Hévécam and Socapalm do not transport products on their own account to other destinations. It is the customer who takes care of transporting his goods to his destination.

Survey of transporters in Kribi

Figure 7 : Survey of transporters in Kribi

4.1.4 Travel time between Ebolowa and Akom II

The journey time was recorded on Friday 09/02/2024 in the direction Ebolowa to Akom II-Kribi with a PRADO car assigned to the mission. This survey was carried out in two stages. The first was on the Ebolowa-Akom II section and the second on the Akom II - Kribi section.
The variables surveyed during the journey were: the PK start and PK end of each homogeneous section in terms of condition, the departure and arrival times on each homogeneous section, and intersections with other well-travelled roads.

On this occasion, the team met Mr Ngah, the ICM manager on site at Akom II, who took us to pay our respects to the local sub-divisional officer.

Road maintenance

Road supporting traffic of Loggs

Project office

Figure 8 : Some images along the road

4.2 Presentation of results

4.2.1 Count results

The count results shows the average daily traffic for the week (from 12 to 18 February 2024) on the various sections. The average of the counts recorded per day (24 hours) and per vehicle category is presented for both directions of traffic, over the week.

4.2.1.1 Ebolowa (Azem) counting station

This station is located on the section of road under study in the village of Azem, 1.9 km from the customs roundabout in Ebolowa. It provides traffic data for the Ebolowa-Akom II section. The average daily traffic at this post is 160 vehicles/day in both directions, excluding motorcycles, whose number is around 860 per day in both directions.

Traffic on this section (excluding motorcycles) is dominated by pick-ups (46%) followed by private vehicles (41%). Heavy Véhicules (HVs), which account for 18%, are dominated by 3-axle trucks (4%), followed by logging trucks (3%).

Total traffic is very balanced in both directions for the period under review. However, the logging trucks recorded were travelling in the Akom II to Ebolowa direction.

Night traffic accounted for 9% of traffic excluding motorcycles.
The table below shows the average weekly traffic on the Ebolowa – Akom II section.

TABLE 11: TRAFFIC ON EBOLOWA –AKOM II ROAD SECTION

Average dayly Traffic during the week from 12 to 18 february 2024

Direction 1 | From :Ebolowa | Towards : AKOM II

	Mo	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL Without MOTO	TOTAL With MOTO
Day	409	30	34	1	0	1	3	3	0	72	481
%Nnigt /24h	4,8 %	10,1%	8,4%	25,0 %	NC	50,0%	11,1 %	0,0 %	NC		
Average Traffic over 24h	430	34	37	1	0	2	4	3	0	80	510

Direction 2 | From : AKOM II | Towards : EBOLOWA

	Mo	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL Without MOTO	TOTAL With MOTO
Day	417	30	35	1	0	1	2	0	5	74	491
%Nnigt /24h	2,9 %	6,4%	7,6%	NC	NC	0,0%	30,0 %	NC	0		
Average Traffic over 24h	430	33	38	1	0	1	2	0	5	80	510

Two directions

	Mo	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL Without MOTO	TOTAL With MOTO
Day	827	61	68	2	0	2	5	4	5	146	973
Average Traffic over 24h	860	66	74	2	0	3	6	4	5	160	1020
Nigth Traffic	33	5	6	0	0	1	1	0	0	14	47

4.2.1.2 Kribi (Lendi) counting station

This single substation is located on the Akom II - Kribi section at the village of Lendi, not far from Kribi. It gives the traffic on the Akom II-Kribi section during the study period. The average daily traffic at this station is 243 vehicles/day in both directions, excluding motorcycles, whose number is 982 per day in both directions.

Traffic on this section (excluding motorcycles) is dominated by pick-ups (36%) followed by private vehicles (30%). Heavy goods vehicles, which account for 26%, are dominated by articulated vehicles (17%), followed by 3-axle trucks and 2-axle trucks (3% each). Logging trucks account for 3% of total traffic, excluding motorcycles.
The Akom II - Kribi direction is slightly busier with 217 veh/day compared with 206 in the opposite direction.
Logging trucks are recorded in the Akom II to Kribi direction. Widjma has its sawmill on the road to Edéa, and logs from logging operations in the study area cross the counting station.
Night traffic accounts for 11% of traffic excluding motorcycles.

The table below shows the average weekly traffic on the Akom II-Kribi section.

TABLE 12: TRAFFIC ON AKOM II- KRIBI ROAD SECTION

Average dayly Traffic during the week from 12 to 18 february 2024

Diection 1 | From : Akom II | Towards : Kribi

	Mo	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL Without MOTO	TOTAL With MOTO
Day	451	72	56	16	3	7	7	36	2	200	650
%Nnigt /24h	10,3%	7,0%	5,7%	6,4%	0,0%	11,1%	15,4%	6,9%	1		
Average Traffic over 24h	502	77	59	17	3	8	9	39	4	217	719

Direction 2 | From : Kribi | Towards: Ebolowa

Heures	Mo	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL Without MOTO	TOTAL With MOTO
Day	416	66	51	15	2	5	5	31	0	176	592
%Nnigt /24h	13,2%	11,9%	25,0%	2,9%	NC	5,9%	0,0%	10,2%	0		
Average Traffic over 24h	479	75	68	15	2	5	5	35	0	206	685

Two directions

	Mo	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL Without MOTO	TOTAL With MOTO
Day	867	138	107	31	4	12	13	68	2	375	1242
Average Traffic over 24h	982	153	127	32	4	14	14	74	4	423	1404
Nigth Traffic	115	14	20	2	0	1	1	6	2	47	162

4.2.1.3 Mengong (Kougoulou) counting station

This single substation on the current section is located on the Mengong-Sangmélima road at the village of Kougoulou. It provides traffic data for the Menong-Sangmelima section.

The average daily traffic at this station is 288 vehicles/day in both directions, excluding motorcycles, which account for 678 motorcycless/day in both directions.

Traffic on this section (excluding motorcycles) is dominated by private vehicles (43%), followed by pick-ups (2%). Heavy goods vehicles, which account for 18%, are dominated by logging trucks (7%), followed by articulated lorries and 3-axle trucks (4% each).

Total traffic is fairly balanced in both directions for the period under review, with 138 veh/d in the Mengong-Sangmélima direction and 150 veh/d in the opposite direction.

Night traffic accounts for 15% of traffic excluding motorcycles.
The table below shows average weekly traffic on the Mengong-Sangmélima section

TABLE 13: TRAFFIC ON MENGONG- SANGMELIMA ROAD SECTION

Average dayly Traffic during the week from 12 to 18 february 2024

Direction 1 | From : Mengong | Towards : Sangmelima

	Mo	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL Without MOTO	TOTAL With MOTO
Day	324	55	30	22	0	3	7	7	0	125	449
%Nnigt /24h	5,3 %	10,5%	5,7%	8,1 %	NC	12,5%	0,0%	26,2 %	NC		
Average Traffic over 24h	342	61	32	24	0	4	7	9	0	138	480

Direction 2 | From : Samgmelima | Towards : Mengong

Heures	Mo	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL Without MOTO	TOTAL With MOTO
Day	324	57	29	23	0	3	3	2	3	120	443
%Nnigt /24h	3,7 %	11,4%	8,7%	5,5 %	NC	NC	18,2 %	33,3 %	1		
Average Traffic over 24h	336	64	32	24	0	3	3	4	20	150	486

Deux sens

	Mo	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL Without MOTO	TOTAL With MOTO
Day	648	111	59	45	0	6	10	9	3	244	892
Average Traffic over 24h	678	125	64	48	0	7	10	13	20	288	966
Nigth Traffic	31	14	5	3	0	0	1	4	17	43	74

4.2.2 RESULTS OF O/D SURVEYS

The results of the O/D surveys carried out over three days at the Mengong station (16, 17 and 18 February 2024) are presented firstly for passengers and secondly for freight.

4.2.2.1 Origin/Destination of passengers

4.2.2.1.1 Origin/Destination of passengers

As shown in the tables below, the main origins are: Ebolowa (42%), Sangmelima (33%) Mengong (14%). Douala and Yaoundé each account for 3% of origins.
The main destinations are: Sangmelima (53%), Ebolowa (31%). Yaoundé accounts for 4% of destinations.

TABLE 14: ORIGIN /DESTINATION OF PASSENGERS IN QUANTITY

Origin		Destination				
Area Nr	Area	1	2	4	6	Total
1	Ebolowa		14		1	15
2	Sangmélima	10		2		12
3	Douala		1			1
4	Yaoundé		1			1
5	Ambam		1			1
6	Mengong	1	1	1	2	5
8	Ma'an		1			1
Total		11	19	3	3	36

TABLE 15: ORIGIN /DESTINATION OF PASSENGERS IN %

Origin		Destination				
Area Nr	Area	1	2	4	6	Total
1	Ebolowa		39%		3%	42%
2	Sangmelima	28%		6%		33%
3	Douala		3%			3%
4	Yaoundé		3%			3%
5	Ambam		3%			3%
6	Mengong	3%	3%	3%	6%	14%
8	Ma'an		3%		0%	3%
Total		31%	53%	8%	8%	100%

4.2.2.1.2 Occupancy of passenger transport vehicules

In terms of occupancy rates, the table below shows that PCs have an occupancy rate of 71%, Mb 87% and PU 50%.

TABLE 16: OCCUPANCY OF PASSENGERS TRANSPORT VÉHICULES

Vehicule Type	Nomber of véhicules	Occupants	Norme	Occupation rate	Average occupation
PC	16	57	5	71%	4
Mb	19	347	21	87%	18
PU (simple and double cabines)	1	3	6	50%	3
Total général	36	407	32	35%	

4.2.2.1.3 Reason of travel

The main reason for travelling is work (39%), followed by visits (23%). Tourism and leisure account for 15% of travel.

TABLE 17: MAIN REASON OF TRAVEL

Reason Nr	Designation	Passenger 1	Passenger2	Total passagers	%
1	Home	2	2	4	6%
2	work	14	14	28	39%
4	Maket	2	2	4	6%
6	Family/Friends	8	8	16	23%
7	Leisure/Tourism	6	5	11	15%
8	others	4	4	8	11%
Total		36	35	71	100%

4.2.2.1.4 Frequency

Occasional journeys account for 34% of travel frequencies, followed by exceptional journeys (17%). 11% of passengers surveyed travel twice a week, and 8% travel 5 times a month.

TABLE 18: FREQUENCY OF TRAVEL

Frequency	Passeger 1	Passenger 2	Total	%
1 times/day	1	1	2	3%
1 timess/week	1	1	2	3%
2 times/week	4	4	8	11%
4 times/week	1	1	2	3%
2 times/ week	2	1	3	4%
3 times/month	1	1	2	3%
5 times/month	3	3	6	8%
Occasional	12	12	24	34%
Exceptional	6	6	12	17%
Grand total	36	35	71	100%

4.2.2.1.5 Profession of travellers

With regard to the professions of the travellers questioned, 44% are civil servants or managers in the private sector, 17% are manual workers and employees, and 11% are unemployed, as shown in the table below.

TABLE 19: PROFESSION OF RESPONDENTS

N° Profession	Designation	Passenger 1	Passenger2	Total passagers	%
10	Traders (10)	3	3	6	8%
11	Executive / Cadre (11)	16	15	31	44%
12	Worker/employee (12)	6	6	12	17%
14	Farmer (14)	1	1	2	3%
15	Unemployed (15)	4	4	8	11%
16	Other (16)	6	6	12	17%
Total		36	35	71	100%

4.2.2.2 Origin/Destination of goods

4.2.2.2.2 O/D of Goods vehicules

The main origins are : Sangmelima (52%); Ebolowa (19%), Mengong and Djoum 11% each. The main destinations are Ebolowa (41%), Sangmelima (26%) and Mengong (22%).).

TABLE 20: O/D OF GOODS VEHICULES BY NUMBER OF VEHICULES

ORIGIN		DESTINATION				
Area Nr	Area	1	2	3	6	Total
1	Ebolowa		5			5
2	Sangmelima	10		1	3	14
3	Douala		1			1
4	Yaoundé		1			1
6	Mengong				3	3
7	Djoum	1		2		3
Total		11	7	3	6	27

TABLE 21: O/D OF GOODS VEHICULES IN %

ORIGIN		DESTINATION				
Area Nr	Area	1	2	3	6	Total
1	Ebolowa		19%			19%
2	Sangmelima	37%		4%	11%	52%
3	Douala		4%			4%
4	Yaoundé		4%			4%
6	Mengong				11%	11%
7	Djoum	4%		7%		11%
Total		41%	26%	11%	22%	100%

4.2.2.2.3 Nature of the products transported

The main types of product transported are construction materials (33%), logs (15%) and agricultural food products (11%).

TABLE 22: NATURE OF GOODS

goods Nr	Designation of goods	Nomber of vehicules	%
1	Country products	1	4%
3	Building materials	9	33%
4	Agri-food products	3	11%
7	Other	9	33%
8	Loggs (timbers)	4	15%
ND		1	4%
Total		27	100%

4.2.2.2.4 Loading rates

In terms of load factor, full trucks account for 89% and half-full trucks for 7%.

TABLE 23: LOADING RATES

N° Loading	Désignation	Total	%
1	Full	24	89%
2	1/2 Full	2	7%
3	Empty	1	4%
Grand total		27	100%

4.2.2.2.5 Destination by load level

33% of full trucks are destined for Ebolowa and 26% for Sangmelima. Douala accounted for 11% of truckloads.

TABLE 24: DESTINATION OF TRUCKS BY LOADING LEVEL IN TERM OF QUANTITY

	Destination				
Loading	Douala	Ebolowa	Mengong	Sangmelima	Total
Full	3	9	5	7	24
1/2 full		1	1		2
Empty		1			1
Grand total	**3**	**11**	**6**	**7**	**27**

TABLE 25: DESTINATION OF TRUCKS BY LOADING LEVEL IN %

	Destination				
Loading	Douala	Ebolowa	Mengong	Sangmelima	Total
Full	11%	33%	19%	26%	89%
1/2 full		4%	4%		7%
Empty		4%			4%
Grand total	11%	41%	22%	26%	100%

4.2.2.2.6 Trip frequency by type of goods

Out of the 15% of goods vehicles surveyed that carry logging trucks, 7% travel 4 times a week, 4% 5 times a week and 4% 6 times a week. Of the 33% of construction materials vehicles surveyed, 22% travel occasionally.

TABLE 26: FREQUENCY OF MOVEMENT BY TYPE OF GOODS IN QUANTITY

Frequency	Type of goods						Total
	Country products	Building materials	Food products	others	Logs	ND	
2 times/week		1		3			4
3 times/week		1	1	1			3
4 times/week					2	1	3
5 times/week					1		1
6 times/week			1		1		2
2 times/month				1			1
Occasional	1	6	1	4			12
Nd		1					1
Grand total	**1**	**9**	**3**	**9**	**4**	**1**	**27**

TABLE 27: FREQUENCY OF MOVEMENT BY TYPE OF GOODS IN %

Frequency Goods	**Type of goods**						Total
	Country products	Building materials	Food products	others	Logs	ND	
2 Times/Week		4%		11%			15%
3 times/week		4%	4%	4%			11%
4 times/week					7%	4%	11%
5times/week					4%		4%
6times/week			4%		4%		7%
2 times/month				4%			4%
Occasional	4%	22%	4%	15%			44%
Nd		4%					4%
Grand total	**4%**	**33%**	**11%**	**33%**	**15%**	**4%**	**100%**

4.2.3 Travel time between Ebolowa and Kribi

The table below shows travel times on each of the Ebolowa-Akom II and Akom II - Kribi sections.

It shows that the travel time with a Prado vehicle is 1h49mn between Ebolowa and Akom II. This time is almost the same between Akom II and Kribi, that is 1h58mn. This gives an average speed of 42.3km/h over the two sections. On the Ebolowa - Akom II section the average speed is 44.5km/h and 40.3km/h between Akom II and Kribi.
The table below shows the travel times for each section.

TABLE 28 : TRAVEL TIMES BETWEEN EBOLOWA AND KRIBI

ETUDE DE TRAFIC SUR LA ROUTE EBOLOWA-AKOM II - KRIBI

RELEVE DU TEMPS MOYEN DE PARCOURS

Date : 09/02/2024

N°	PKD	PKF	long km	Type de route(RT, RB)	Etat de la route (très bon état, bon état, moyen, dégradé, très dégradé)	Géométrie de la route (largeur, nombre de sens, trottoirs, accitements)	heure depart (heure:minutes)	heure arrivee (heure:minutes)	Temps de parcours (heure:minutes)	Vitesse moyenne (km/h)	Observations
1	PK0+00	PK1+900	1,9	RT	Moyen	2 sens	10:26	10:31	**0:05**	**22,80**	PKD=PK0: Rond point Douane Ebolowa Si 2
2	PK1+900	PK16+600	14,7	RT	Moyen	2 sens	10:31	10:54	**0:23**	**38,35**	PK1+900:Poste de comptage
3	PK16+600	PK29+400	12,8	RT	Moyen	2 sens	10:54	11:12	**0:18**	**42,67**	PK16+600:Intresection vers Nyangong
4	PK29+400	PK45+300	15,9	RT	Moyen	2 sens	11:12	11:32	**0:20**	**47,70**	PK29+400:Entrée exploitation forestiere CUF
5	PK45+300	PK80+900	35,6	RT	Moyen	2 sens	11:32	12:15	**0:43**	**49,67**	PK45+300: Intersection allant vers Kong (route forestère allant vers Maan Memvele)
6	PK80+900		0,0	RT	Moyen	2 sens	12:15				PK80+900: Akom II Dalot après l'intersection allant vers Bibindi (face Brigarde de gendarmerie)
SOUS TOTAL EBOLOWA AKOM II			80,9		Moyen	2 sens			**1:49**		
Vitesse Moyenne sur Ebolowa-Akom II (km/h)			**44,5**								
Trafic enregistré sur la section Ebolowa-Akom II pendant le parcour y compris notre vévicule: Moto (14); VP (02), PU (01); C3E (01); Gr(01)											
Section AKOM II - KRIBI											
7	PK80+900	PK101+100	20,2	RT	Moyen	2 sens	13:24	13:51	**0:27**	**44,89**	Route entretenue sur certaines sections
8	PK101+100	PK115+000	13,9	RT	Dégradé	2 sens	13:51	14:13	**0:22**	**37,91**	PK101+100:carrefour Akok (pluie il ya quelques jours)
9	PK115+000	PK127+200	12,2	RT	Dégradé	2 sens	14:13	14:33	**0:20**	**36,60**	PK135+200:hotel de ville Adjap (pluie il ya quelques jours)
10	PK127+200	PK135+300	8,1	RT	Dégradé	2 sens	14:33	14:48	**0:15**	**32,40**	PK147+400:intersection route communale, travaux sur akomI-kienke
11	PK135+300	PK135+700	0,4	RT	Dégradé	2 sens	14:48	14:50	**0:02**	**12,00**	PK155+500:Intersection route vers les plantation HEVECAM
12	PK135+700	PK160+100	24,4	RT	Moyen	2 sens	14:50	15:22	**0:32**	**45,75**	PK180+300:PKF debut bitume
13	PK160+100	PK160+100	0,0								
SOUS TOTAL AKOM II kribi			**79,2**						**1:58**		
Vitesse Moyenne sur Akom II - Kribi (km/h)			**40,3**								
TOTAL EBOLOWA-AKOM II -KRIBI			**160,1**						**3:47**		
VITESSE MOYENNE EBOLOWA-AKOM II -KRIBI			**42,3**								

RT: Route en terre **RB: Route bitumee**

4.2.4 Results of surveys and interviews with transporters

Surveys and interviews were conducted with transporters in Ebolowa and Kribi.

4.2.4.1 Surveys and interviews in Ebolowa

4.2.4.1.2 Surveys in Ebolowa

In Ebolowa, the interviewers administered the previously designed questionnaire to 10 travel agencies. Out of the 10 agencies, 8 declared a total fleet of 170 vehicles. Three of these travel agencies have 30 vehicles each and the smallest has 08.

All these agencies transport people and couriers and therefore do not operate HGVs.

Only one of these agencies stated that it does the Ebolowa-Akom II route for a fare of 3,500 francs per person and 1,000 francs for luggage. The declared journey time for this route is 4 hours. It is important to note that the 4 hours takes into account loading and unloading time at intermediate points on the way.

Other destinations mentioned by respondents included Ambam, Mengong, Yaoundé, Sangmelima, etc.

The table below gives the rates for people, freight and time for certain destinations from Ebolowa.

TABLE 29: TRAVEL TIME AND TRANSPORT FARE FROM EBOLOWA

Destination	Travel time (h)	Transport Fare/passenger	Fret rates
Mengong;	0,5	1000	500
Ngoulemekong	0,75	1500	500
Ambam	2	2000	1000
Kyeossi ;	3	2500	1500
Abang Minko'o	3	2500	1500
Mvangan	2,75	3500	500
Yaoundé;	2,5	2000	1000
Sangmelima	1,5	1500	1000
Bengbis	2	2500	1000
Foumban		7500	
Kutaba		7500	

4.2.4.1.3 Interview in Ebolowa

Interviews were conducted at 6 travel agencies and three bus stations.

They revealed that

- The Ebolowa-Kribi road is in very poor condition and impassable in rainy weather.
- Some hauliers abandoned this route several years ago.
- It's quite dangerous to cross with logging trucks on this narrow road.
- As for the other asphalted roads to Yaoundé, Ambam, etc., their condition is just as bad.
- There are no vertical or horizontal signs.
- The poor state of the roads is too costy in terms of vehicle maintenance.

Asphalting the Ebolowa-Akom II-Kribi road would give several travel agencies and other carriers the opportunity to develop their business on this route.

4.2.4.2 Transporters surveys and interviews in Kribi

4.2.4.2.2 Surveys in Kribi

In Kribi, the interviewers administered the previously designed questionnaire to 3 car rental companies, 04 travel agencies and three bus stations. Their total fleet is estimated at 200 vehicles.

All these agencies transport people and messages.

Out of these transporters, only the car rental agencies claim to operate the Kribi-Ebolowa route at 100,000 francs.

The other destinations mentioned by the respondents are mainly Yaoundé, Socapalm, Hévécam, Widjma etc...
The table below gives the price per person, baggage and time for certain destinations from Ebolowa.

TABLE 30 : TRAVEL TIME AND TRANSPORT FARE FROM KRIBI

Destination	Travel Time (h)	Transport fare /passager
Yaoundé;	5	3500
Abong Mbang	10	8000
Socapalm	2	800
Wijma	2	1000
Hevecam	2	2500
Adzap	4	3000
Zingui	4	3500
Akom I	2	2500
Akom II	4	5000
Afan Oven	1,5	2000
Bidou	2	1000

4.2.4.2.3 Interwiews in Kribi

Interviews with 4 travel agencies and three bus stations revealed the following:
- The Kribi-Akom II road is in very poor condition and impassable in rainy weather.
- Some hauliers abandoned this route several years ago.
- Crossing the road, which is not wide, is quite dangerous with logging trucks.
- **To get from Kribi to the regional capital (Ebolowa) in rainy weather, you have to passe through Yaoundé.**

- The tarmac road to Edéa is also in a poor state. It lacks vertical and horizontal signs.
- The poor condition of the roads is too costy in terms of vehicle maintenance.

Asphalting the Ebolowa-Akom II-Kribi road would give several travel agencies and other carriers the opportunity to develop their business on this route.

Another interview of no less importance took place with the site manager of CTB (Construction Travaux Publics et Bâtiments) Sarl, a transit park for trucks from the hinterland (Ndjamena and Bangui), located in Kribi at the entrance to the Akom II-Kribi section. This park has reported generating an average of 60 trucks (Articulated Units) per day of traffic. Their long-term forecast is to increase this to between 200 and 300 Articulated Units per day. According to this manager, if Ebolowa Kribi is tarred, they will use this shorter route.

He also pointed out that many parks in Douala want to relocate to Kribi.

KMM, which produces tiles in Kribi, exploits a clay quarry on the Akom II road to supply its factory. This raw material is transported to the factory by articulated lorries.

4.2.4.2.4 Kribi industrial Port Complexe

The Kribi industrial port complex was officially commissioned in 2018 in response to the congestion at the port of Douala, which prevents large-capacity vessels from docking. This complex has no water depth, surface or route constraints. It is suited to traffic requiring large, deep bodies of water for manoeuvring ships (such as large container ships, whose length, width and draught characteristics are constantly increasing) or large inland storage and work areas. Covering an area of 26,000 hectares, the first phase of this port infrastructure includes: (i) a 350-metre-long container terminal; and (ii) a 265-metre-long multi-purpose terminal. The associated industrial complex, currently under development, should eventually include: (i) a vast area for heavy, medium and light industry; (ii) a modern residential city with housing that will house up to 300,000 people by 2040, and (iii) new and improved transport infrastructure.
This major complex aims to promote the socio-economic development of Cameroon's central and southern regions. Specifically, it will open up these regions to ensure links between production and consumption areas. It will also facilitate transit road traffic to certain countries in the sub-region, namely Chad, CAR and Equatorial Guinea.
To respond effectively to the ongoing challenges of a constantly changing logistics sector, marked by immediacy, globalisation, massification and digitalisation, where players are increasingly demanding, the Autonomous Port of Kribi is fully committed to the fluidity and dematerialisation of procedures and interactions. In particular, it has implemented robust, customised and intelligent information systems that automate end-to-end processes for collecting declarations, managing, planning, organising and monitoring port calls.

The table below shows the evolution of container traffic at KAP in Twenty foot Equivalent Unit (TEU) between 2018 and 2021. Total traffic rose from 18,650 TEU in 2018 to 8,171 TEU in 2021. This represents a growth rate of 113% between 2020 and 2021.

TABLE 31: TRAFFIC EVOLUTION IN KRIBI PORT (TEU)

TRAFIC TEU	2018	2019	2020	2021
Import (full)	3 069	8 568	23 195	49 818
local Import	2 829	7 061	20 585	44 001
Import hinterland	240	1 507	2 610	5 817
Export (full)	3 321	8 310	7 347	9 444
local Export	2 988	6 748	4 908	6 242
Export hinterland	333	1 562	2 439	3 202
Emties (I + E) (1)	12 260	11 696	7 766	22 509
Total domestic full 2= (3+4)	6 390	16 878	30 542	59 262
Total transit (3)	573	3 069	5 049	9 019
Total local CMR (4)	5 817	13 809	25 493	50 243
GENERAL TOTAL 5= 1+2	18650	28574	38308	81771

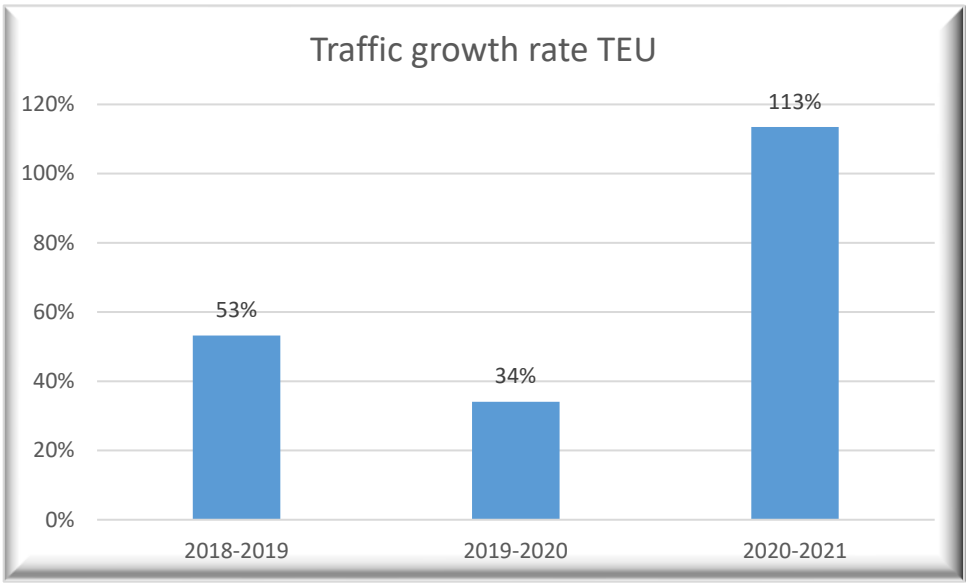
Source : KAP/DEX

Traffic at the Kribi port indicates that in 2021, out of a total of 81,771 TEU, 9,019 will be in transit, i.e. around 11%. %.

Furthermore, optimising the long-term operation of the Kribi Port and Industrial Complex is largely dependent on its access conditions, in particular by roads capable of ensuring the fluidity and ease of movement of incoming and outgoing freight, as well as the safety of the various types of traffic. An analysis of mobility conditions in the complex area revealed a number of major problems, including the physical condition of existing roads and the inadequacy of access roads. These constraints hamper the flow of traffic in the area, making it difficult to access, which has a negative impact on its competitiveness and therefore on all the associated national and trans-African corridors.

With regards to traffic growth at the port of Kribi, the growth rate in TEU has risen from 53% (2018-2029) to 113% (2020-2021). This strong growth in traffic is proof of the high demand for transport throughout the sub-region in general and in Cameroon in particular. The asphalting of the Ebolowa-Akom II-Kribi road will help to reduce the deficit in good quality road infrastructure.

The figure below shows the rate of growth in port traffic between 2018 and 2021.



Source : KAP/DEX and consultant's compilation

FIGURE 9 : ANNUAL GROWTH RATE OF TOTAL TRAFFIC AT KAP BETWEEN 2018 AND 2021

Truck traffic at KAP varies from month to month throughout the year. The table below shows that truck traffic peaks between August and September. The growth rate for lorries between 2020 and 2021 is 111%, which is consistent with the rate found for TEU traffic for the same period.

The table below shows monthly lorry traffic for 2020 and 2021.

TABLE 32: LORRY TRAFFIC IN 2020 AND 2021 AT KAP (TEU)

Lorry	Year 2020	Year 2021	Total général
Jan.	1151	2533	3684
Feb.	849	2815	3664
March	1480	3756	5236
Apr.	1504	2825	4329
May	1354	3275	4629
June	1525	3903	5428
Jul	1915	3536	5451
August	1856	4924	6780
Sept	3079	4044	7123
Oct.	2234	4588	6822
Nov.	1729	5077	6806
Dec.	2989	4500	7489
Total général	**21665**	**45776**	**67441**

Source : KAP/DEX

In terms of loading, the following table shows that in 2020, empty lorries will account for 20% of the number of lorries registered during the year. This ratio will rise to 28% in 2021. Trucks in transit represent 13.17% of traffic in 2020 and 11.0% of truck traffic in 2021.

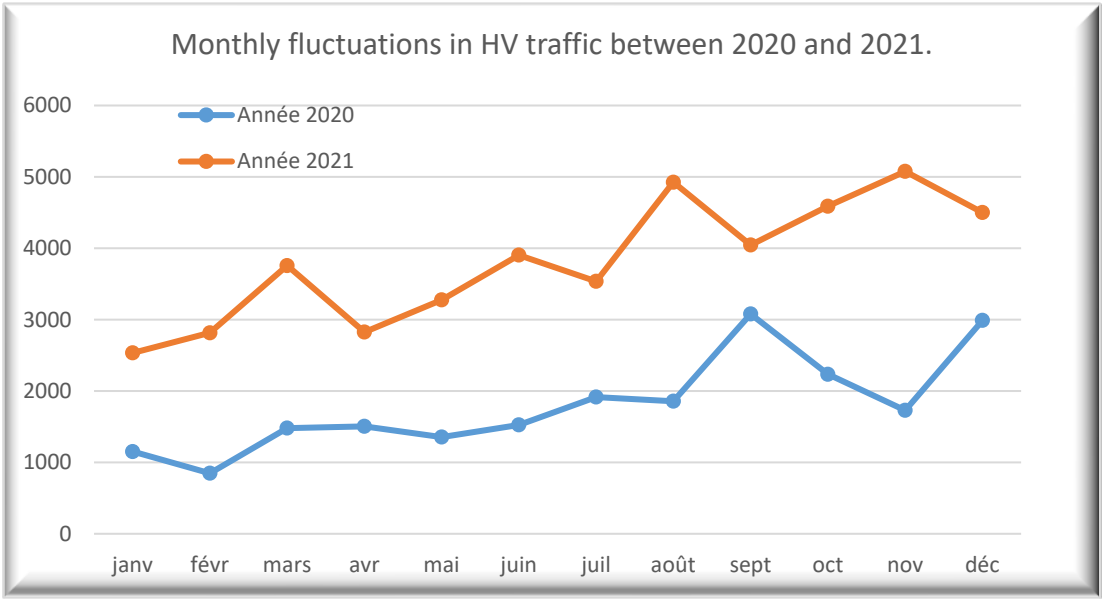
The AADT for trucks in 2020 was 59.35 trucks/d, rising to 125.41 trucks/d in 2021.

TABLE 33: DISTRIBUTION OF LORRIES BY TRAFFIC (TEU)

Share of HV per Traffic	Year 2020	Year 2021	TOTAL
Empty (I + E) (1)	4 392	12 601	16 993
Total full domestic (2) = (3) +(4)	17 273	33 175	50 448
Total transit (3)	2 855	5 049	7 904
Total local CMR (4)	14 418	74 501	88 918
TOTAL GENERAL (5) = (1) +(2)	21 665	45 776	67 441

Source : KAP/DEX

The graph below shows the monthly fluctuation in lorry numbers and the growth in lorry traffic between 2020 and 2021.



Source : KAP/DEX et consultant's compilation

FIGURE 10 : MONTHLY FLUCTUATIONS IN HV TRAFFIC BETWEEN 2020 AND 2021.

4.2.4.3 Transit traffic on various corridors

The table below summarises traffic on the following corridors:

Douala-N'Djamena Corridor; Douala-Bangui Corridor; Douala-Brazzaville Non-Conventional Corridor, Douala-Libreville Non-Conventional Corridor and Douala-Bata Non-Conventional Corridor.

Observation of traffic on these corridors makes CHAD and CAR the largest (origin/destination) transit countries. Gabon and Equatorial Guinea account for less than 10% of transit traffic.

Transit traffic that could be diverted to the Ebolowa-Akom II-Kribi road is traffic on the three non-conventional corridors (Douala-Brazzaville, Douala-Libreville and Douala-Bata).

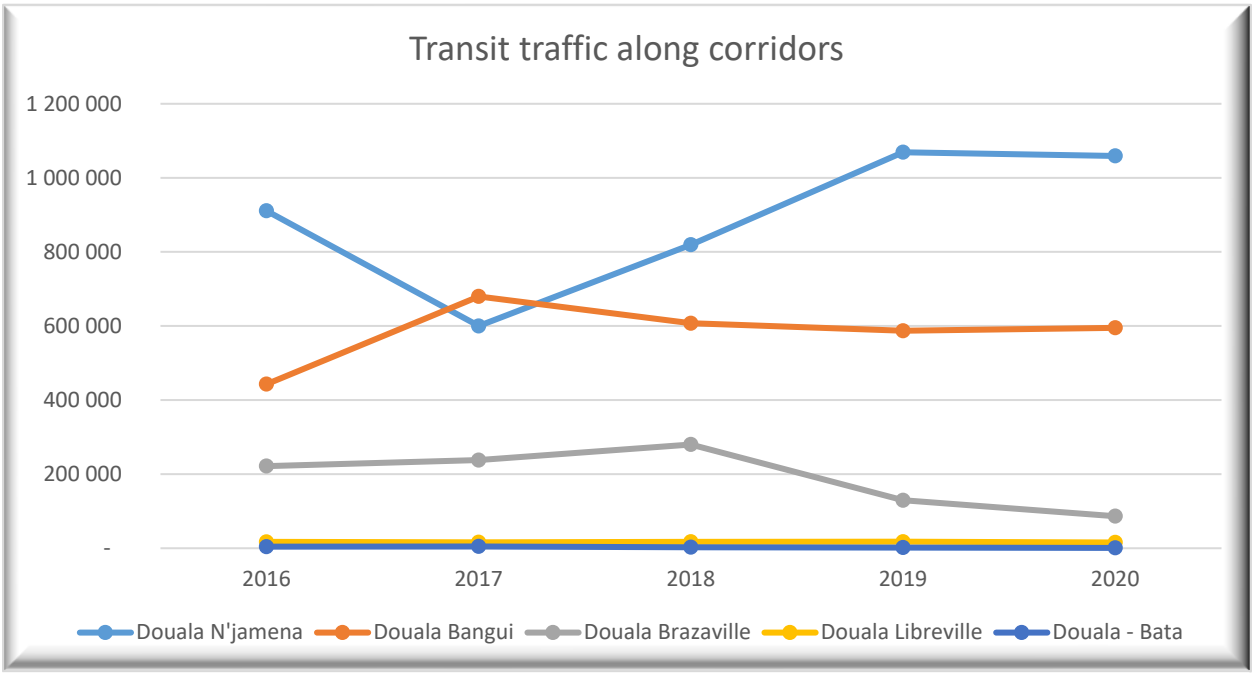
However, after the construction of the bridge over the Ntem, the studies for which have already been completed, transit traffic between Douala and Bata will no longer

be able to use the road under study, even if it is asphalted. This traffic will go directly over the Ntem Bridge.

TABLE 34: TRANSIT TRAFFIC ON THE CORRIDORS

DESIGNATION	2016	2017	2018	2019	2020
DOUALA-N'JAMENA CORRIDOR					
Annual tonnage	911 028	600 080	819 221	1 069 251	1 059 186
Vehicle movements	36 453	21 086	26 167	43 190	42 055
DOUALA-BANGUI CORRIDOR					
Annual tonnage	442 839	679 941	607 255	586 997	595 048
Vehicle movements	15 069	23 353	22 642	24 149	28 675
NON-CONVENTIONAL CORRIDOR DOUALA-BRAZAVILLE					
Annual tonnage	221 633	237 781	280 142	129 395	86 197
Vehicle movements	7 373	9 674	11 334	5 564	3 928
NON-CONVENTIONAL CORRIDOR DOUALA-LIBREVILLE					
Annual tonnage	17 007	15 851	17 448	17 428	15 350
Vehicle movements	2 393	2 794	2 968	2 681	2 484
NON-CONVENTIONAL CORRIDOR DOUALA-BATA					
Annual tonnage	3 920	4 604	2 539	1 614	991
Vehicle movements	368	394	235	409	564

Source ; Transtat 2021 and consultant's compilation



Source ; Transtat 2021 et compilation du consultant

FIGURE 11 : TRANSIT TRAFFIC ALONG CORRIDORS.

5 TRAFFIC FORECASTS

5.1 Forecasting methodology and assumptions

Transport demand is forecasted by evaluating the following three traffic components:

-**Normal traffic**, which is defined as traffic that would normaly occur on the project route as a result of the general economic development of the area of influence, with traffic conditions remaining the same as today;

-**Diverted traffic**, which reflects the share of traffic gained by the development at the expense of competing transport solutions. Diverted traffic is characterised by the fact that it exists independently of the planned development. Traffic diversion is simply a transfer between different routes to reach the same destination.

For each of these three components, normative relationships based on trend or econometric models between the traffic recorded and the main associated parameters (population growth, per capita income, etc.) will be determined. Based on these relationships, traffic forecasts will be drawn up for different time horizons.

-**Induced traffic**, which reflects the influence of the development planned by the project, resulting from an increase in production or sales thanks to the reduction in transport costs due to the facilities offered by the road development and the movements of people now taking place which, because of the deteriorated or difficult state of the road network, did not take place previously or were made to other destinations;

5.1.1 Normal traffic forecasting methodology

The various methods used for normal traffic projections can be summarised as follows:

For freight and passenger traffic :

- ✓ Simple overall extrapolation of past traffic trends,
- ✓ Correlation between traffic and certain macro-economic parameters,
- ✓ Use of traffic generation models.

For passenger traffic only:

- ✓ Study of traffic trends as a function of population, income categories, changes in vehicle stock, etc.
- ✓ Based on freight traffic, application of correlation between freight flows and passenger movements.

The extrapolation approach has the advantage of being simple and incorporating all the variables and the economic context of the area of influence. These results are generally good in the short term, but are not suitable if economic changes occur. Furthermore, medium and long-term forecasts run the risk of being distorted by shifts or changes. It is therefore necessary to have a long series of statistical data relating to traffic in order to identify structural trends.

The main model used by the "traffic generation model approach" is the gravity model, based on exchanges of people and goods according to origin and destination populations and use values.

In many cases, existing traffic can be reconstructed using formulas such as :

$$T_{ab} = K * \frac{(P_a * P_b)^n}{C^m}$$

Formula in which :

T_{ab}: observed flow between Area a and Area b

- ✓ P_a and P_b are the respective populations of Areas a and b
- ✓ C is a usage value for the route joining Areas a and b
- ✓ K, m and n are coefficients determined by statistical adjustment on existing traffic. In general, n is in the range 0.5 to 1 and m is in the range 1.6 to 2. K is a constant that is likely to increase over time as a function of the car ownership rate and overall economic trends.

The correlation method involves looking for a correlation between traffic levels and certain macro-economic parameters. The normal traffic growth rates to be expected are deduced from the growth rates of the macroeconomic parameters and the assumptions made about their evolution. The method treats passenger and freight traffic separately.

This method is very good if it takes account of the regional nature of economic development. To be complete, it must take account of continuous drift over time, particularly for passenger transport.

Among these methods, the Consultant has chosen the econometric type model, built on hypotheses relating to the social and economic parameters of the "future", as opposed to the extrapolation model which, despite its integration of all the variables and the economic context, is based solely and exclusively on the time variable and assumes that "the past conditions the future" and does not take into account major changes in policies or strategies.

This choice is also justified by the following two factors:

-Governments and development partners working at country level in Sub-Saharan Africa in general, and in Cameroon in particular, are putting forward strategies to combat poverty, sustainable development and the Millennium Goals, which reflect a general desire to "break away" from the current context and which do not allow the simple reproduction of the "current", by means of extrapolation models,

-Over the lifetime of the project, the technical, social and economic baseline data will change to such an extent that very little technical and economic reasoning can be reproduced without a significant margin of error.

5.1.2 Methodology for forcasting diverted traffic

This is traffic attracted by the new development from other roads with the same destination, or from other modes of transport on the same route. Diverted traffic is characterised by the fact that it exists independently of the planned development and is simply a transfer between different means of reaching the same destination.

It is assessed by examining the configuration of the transport networks and the transport system development projects and programmes in the project's area of influence.

In the case of this study, the Origin/Destination surveys are used to estimate the traffic that will be diverted on the Ebolowa - Akom II - Kribi route once the road is built.

5.1.3 Methodology for forecasting induced traffic

The induced traffic linked to the rehabilitation of the project route is mainly related to the reduction in vehicle operating costs. Its volume is measured as a function of the elasticity of transport demand in relation to transport costs, using the following model:

$$e = \frac{\frac{dD}{D}}{\frac{dC}{C}}$$

Where:

e : cost elasticity of demand

D : transport request

C : cost of transport

The elasticity "e" is estimated on the basis of economic data (household survey) or, failing that, documents and previous studies carried out in the project's area of influence or in Cameroon. The variation in vehicle operating costs is estimated on the basis of the IRI before and after development of the road.

5.2 Traffic forcast results

5.2.1 Forcast of Normal Traffic

As we have already indicated, the project's Area of direct influence is made up of a main area made up of villages and agglomerations crossed by the project axis or contiguous to the axis, as well as villages with direct access to the project axis via related roads. It has been assimilated to those of the sub-divisions of the divisions *of Mvila, Dja et Lobo, Vallée du Ntem* and *Océan*.

5.2.1.1 Population growth rate in the project's area of influence

According to the BUCREP report, the population of the project's direct area of influence (Southern Region) is estimated at 783,561 inhabitants in 2020, based on a projection at a constant rate of 0.7% per year.

We are keeping this population growth rate in the project impact Area for future horizons.

5.2.1.2 Macroeconomic indicators

Economic activity is taking place in an environment marked internationaly by a recession on an unprecedented scale. At national level, several constraints are weighing on economic activity, notably the security crises and energy problems. The GDP growth rate, which was 4.1% in 2018, has fallen to 3.7% in 2019, -2.6% in 2020, 3.3% in 2021, 4.1% in 2022 and 4.4% in 2023.
In our calculations, we are maintaining GDP growth at 4.5%.

5.2.1.3 Passenger vehicule traffic grow rate

To estimate the rate of growth in passenger traffic, the Consultant has adopted a model that consists of linking traffic trends to explanatory factors:
-Population growth in the project's area of influence
-Population income growth rate, which will be approximated by GDP.
The traffic growth rate can be explained as follows:

$$\frac{\Delta VP}{VP} = (1 + \frac{\Delta P}{P}) * (1 + k * \frac{\Delta R}{R}) - 1$$

- $\frac{\Delta VP}{VP}$: average annual growth rate in passenger vehicle traffic
- $\frac{\Delta P}{P}$: population growth rate in the project's direct area of influence
- $\frac{\Delta R}{R}$: GDP per capita growth rate
- k : coefficient of elasticity in relation to GDP per capita

Studies in similar countries in terms of socio-economic characteristics recommend an equal elasticity of 1.3. The Consultant will take this value of K for the estimation of the passenger traffic growth rate.

The growth rate of passenger traffic is then equal to **(1+2.8%) *(1+1.3*4,4%) -1=6,4%**

For reasons of prudence, we have adopted a passenger traffic growth rate of 5% for our calculations.

5.2.1.4 Freigth traffic growth rate

Growth in "national" freight traffic is a function of economic development in the project's area of influence. The model used to estimate the growth rate is as follows

$$\frac{\Delta PL}{PL} = m \frac{\Delta G}{G}$$

With :

- $\frac{\Delta PL}{PL}$: Average annual growth rate of heavy goods vehicle traffic
- $\frac{\Delta G}{G}$: Average annual GDP growth rate
- m : Coefficient of elasticity of heavy goods vehicle traffic in relation to GDP

In developing countries, elasticity m varies between 1 and 2. For the purposes of the study, the Consultant has adopted a conservative elasticity coefficient of 1.3. On this basis, the average annual growth rate of freight traffic according to the scenario is shown in the table below.

The Freigth traffic growth rate is then equal to **1.3*4,4% =5,7%**

For reasons of prudence, we have adopted a 6% growth rate for freight traffic in our calculations.

5.2.2 Forecasting diverted traffic

Serving the ports or industrial port complexes by land is a major challenge, and one on which the competitiveness of port infrastructures and their ability to compete on a national, regional and global scale are heavily dependent.
The majority of flows are expected to converge on the Edéa - Kribi section, which will carry the bulk of traffic to and from the Kribi industrial port complex. Flows to and from the South, the Congo Equatorial Guinea, Gabon and part of the flows generated by/drawn from the Eastern Province should take place via the **Mbalam - Ebolowa - Kribi route and Kyeossi/Ngoazil-amabm-ebolowa-Kribi.**

The implementation of a development that meets the requirements in terms of quality of service, comfort and safety should have an impact on the distribution of transport demand between the alternative routes. With the construction of the Sangmelima-Djoum-Congo border road and the upgrading of the Yaoundé-Mbalmayo-Sangmelima road to standard, demand for transport between Congo and Cameroon will increase, with traffic being diverted from certain alternative routes to the new road. This diverted

traffic will represent around 10% of the section's normal traffic in the year it comes into service.

The O/D survey carried out at Mengong shows that 4% of goods vehicles coming from Douala have Sangmelima as their destination. These vehicles could use the Ebolowa Kribi road once it is built.

In addition, surveys conducted with CTB and hauliers promise a diversion of traffic on this route once the road is paved.

The estimate of diverted traffic was based on O/D surveys and counts carried out in 2018 as part of the development of the Integrated Multimodal Transport Infrastructure Strategy (S2ITM). During the traffic surveys, two posts were installed in the south to capture traffic likely to be diverted onto the Ebolowa-Akom II-Kribi route once this road is asphalted. These are substation No. 7 on the N9, more precisely on the Olonou-Djoum section substation No. 8 on the N17B, on the Djoum-Oveng section and substation No 2 on the N2 on Ambam – Meyo centre section.
Traffic counts and an O/D survey were carried out at each of these stations.

In order to present the traffic projections by direction of traffic, the results of the O/D survey database and the traffic counts carried out at these two posts will also be presented by direction of traffic.

Traffic going in the direction from Olounou to Djoum or from Olounou to Oveng would impact the project in the direction from Kribi to Akom II and from Akom II to Ebolowa on both sections of the project.

TABLE 35 : TRAFFIC LIKELY TO BE DIVERTED IN THE KRIBI TO AKOM II AND AKOM II TO EBOLOWA DIRECTIONS

VehiculeType	Direction during survey	Number of vévicules that could be diverted	Number of vehicule surveye d	% diverted over surveyed vehicules	AAD T	Traffic that could be diverte d in 2018
	Station number 7:Situated on N9 Olonou Djoum road Section					
VP	1.From Olounou towards Djoum		16	0%	42	0
PU	1.From Olounou towards Djoum	2	18	11%	58	6
C2E	1.From Olounou towards Djoum	1	8	13%	16	2
C3E	1.From Olounou towards Djoum	12	21	57%	73	42

VehiculeType	Direction during survey	Number of vévicules that could be diverted	Number of vehicule surveye d	% diverted over surveyed vehicules	AAD T	Traffic that could be diverte d in 2018
EA	1.From Olounou towards Djoum		6	0%	30	0
Gr	1.From Olounou towards Djoum		4	0%	4	0
	Station number 8: situated on N17B Olounou-Oveng road section					
VP	1.From Olounou towards Oveng		11	0%	18	0
PU	1.From Olounou towards Oveng		8	0%	17	0
C2E	1.From Olounou towards Oveng		0		7	0
C3E	1.From Olounou towards Oveng	3	4	75%	17	13
EA	1.From Olounou towards Oveng	1	1	100%	10	10
Gr	1.From Olounou towards Oveng	1	3	33%	2	1
	Traffic that could be diverted from the two O/D stations					
VP	1.Station Nr 7 and Nr 8	0	27	0%	60	0
PU	1.Station Nr 7 and Nr 8	2	26	8%	75	6
C2E	1.Station Nr 7 and Nr 8	1	8	13%	23	3
C3E	1.Station Nr 7 and Nr 8	15	25	60%	90	54
EA	1.Station Nr 7 and Nr 8	1	7	14%	40	6
Gr	1.Station Nr 7 and Nr 8	1	7	14%	6	1
Total Trafic devié						**69**

Source: S2ITM traffic survey database and consultant's compilation

This table shows that if Ebolowa-Akom II-Kribi had been asphalted in 2018, 69 vehicles per day would divert onto the new route in the direction indicated, broken down as follows: PU (6), C2E (3), C3E (54), EA (6), Gr (1)

TABLE 36 : TRAFFIC LIKELY TO BE DIVERTED IN THE EBOLOWA TO AKOM II AND AKOM II TO KRIBI DIRECTIONS

VehiculeType	Direction during survey	Number of vévicules that could be diverted	Number of vehicule surveyed	% diverted over surveyed vehicules	AAD T	Traffic that could be diverte d in 2018
	Station number 7:Situated on N9 Olonou Djoum road Section					
VP	2.From Djoum towads Olounou	1	15	7%	46	3

VehiculeType	Direction during survey	Number of véviculles that could be diverted	Number of vehicule surveyed	% diverted over surveyed vehicules	AADT	Traffic that could be diverted in 2018
PU	2.From Djoum towads Olounou		9	0%	64	0
C2E	2.From Djoum towads Olounou		0		15	0
C3E	2.From Djoum towads Olounou	1	2	50%	37	19
EA	2.From Djoum towads Olounou	1	3	33%	9	3
Gr	2.From Djoum towads Olounou	18	41	44%	55	24
	Station number 8: situated on N17B Olounou-Oveng road section					
VP	2.From Oveng towards Olounou		5	0%	20	0
PU	2.From Oveng towards Olounou	1	2	50%	9	5
C2E	2.From Oveng towards Olounou		0		3	0
C3E	2.From Oveng towards Olounou		0		3	0
EA	2.From Oveng towards Olounou		1	0%	0	0
Gr	2.From Oveng towards Olounou	3	7	43%	43	18
	Traffic that could be diverted from the two O/D stations					
VP	2.Station Nr 7 and Nr 8	1	20	5%	66	3
PU	2.Station Nr 7 and Nr 8	1	11	9%	73	7
C2E	2.Station Nr 7 and Nr 8	0	0		18	0
C3E	2.Station Nr 7 and Nr 8	1	2	50%	40	20
EA	2.Station Nr 7 and Nr 8	1	4	25%	9	2
Gr	2.Station Nr 7 and Nr 8	21	48	44%	98	43
Total Trafic devié						**75**

Source : Base de données enquêtes de trafic S2ITM et compilation du consultant

This table shows that if Ebolowa-Akom II-Kribi had been asphalted in 2018, 75 vehicles per day would divert onto the new route in the direction indicated, broken down as follows: VP (03), PU (7), C2E (0), C3E (20), EA (2), Gr (43).

TABLE 37 : TRAFFIC FRON SUBSTATION 2 LIKELY TO BE DIVERTED IN THE EBOLOWA TO AKOM II AND AKOM II TO KRIBI DIRECTIONS

VehiculeType	Direction during survey	Number of véviculles that could be diverted	Number of vehicule surveyed	% diverted over surveyed vehicules	AADT	Traffic that could be diverted in 2018
	Direction 1 Ambam - Ebolowa-towards KRIBI					

VehiculeType	Direction during survey	Number of vévicules that could be diverted	Number of vehicule surveyed	% diverted over surveyed vehicules	AADT	Traffic that could be diverted in 2018
VP	From Ambam towards Ebolowa		1	0%	123	0
PU	From Ambam towards Ebolowa				28	0
Mb	From Ambam towards Ebolowa		7	0%	67	
AC	From Ambam towards Ebolowa				8	
C2E	From Ambam towards Ebolowa	7	18	39%	34	13
C3E	From Ambam towards Ebolowa		2	0%	14	
EA	From Ambam towards Ebolowa	2	8	25%	19	5
Gr	From Ambam towards Ebolowa	8	12	67%	29	19
	Direction 2 : Kribi - Ebolowa towards-AMBAM					
VP	From Ebolowa towards Ambam	2	10	20%	123	25
PU	From Ebolowa towards Ambam				28	
Mb	From Ebolowa towards Ambam		17	0%	67	
AC	From Ebolowa towards Ambam				8	
C2E	From Ebolowa towards Ambam	1	3	33%	34	11
C3E	From Ebolowa towards Ambam	1	2	50%	14	7
EA	From Ebolowa towards Ambam	9	21	43%	19	8
Gr	From Ebolowa towards Ambam		8	0%	29	0
Total Trafic devié dans les deux sens						**88**

Source : Base de données enquêtes de trafic S2ITM et compilation du consultant

The table N° 37 shows that if Ebolowa-Akom II-Kribi had been asphalted in 2018, 88 vehicles per day would divert onto the new route in the two directions in witch 37 from Ebolowa towards Akom II and Kribi and 51 in the opposite direction.

5.2.3 Forecasting induced traffic

Induced traffic reflects the impact of the development on travel conditions and, consequently, user mobility. It is a function of the reduction in general transport costs. In the case of the project under study, the main aim of the improvements selected will be to improve the current service offering. An appreciable improvement will therefore be seen over the lifetime of the project route as soon as it is brought into service.

	VP	VM
$\Delta CEV/_{CEV}$	32%	**38 %**

Various studies have examined the levels of elasticity of transport demand with respect to transport costs in various African countries. They conclude that elasticity generally varies in the range [0.6 - 2.0], with a reasonable average equal to 1.2. This average corresponds to the change in pavement condition from unpaved to paved, for example. For the construction of the Ebolowa-Akom II-Kribi road, the Consultant used the value 0.6

for estimating induced traffic and the induction rate found is 19.2% of normal traffic for passenger traffic and 22.8% for goods traffic in the year the project is commissioned.

5.2.4 Total traffic forecast

With a construction period of three years, the road could be brought into service in 2027. Diverted and induced traffic will then become apparent.

Following the results of the "Study for the calibration of the HDM4 model: Typical vehicle characteristics" carried out in 2009 at MINISTRY OF PUBLIC WORKS, the coefficients for converting vehicles into Private Vehicules Unit (PVU) are as follows: Motorbike (0.5 PVU), PC and PU (1 PVU), Mb (1.2 PVU), AC (1.8 PVU), C2E (1.5 PVU), C3E (1.8 PVU), EA and Gru (2.2 PVU).

5.2.4.1 Traffic forecast on Ebolowa-Akom II section

On the Ebolowa-Akom II section, the basis for the projection is 2019 traffic, which is more consistent with historical traffic data from MINISTRY OF PUBLIC WORKS. The total projected Average Annual Daily Traffic (AADT) in both directions of traffic would be 869 veh/d in 2027 when tared road ist put into service.

5.2.4.1.1 AADT in the direction from (Ebolowa to Akom II)

Assumming tha in 2027 the tared road is opened to the circulation, the projected Average Annual Daily Traffic (AADT) from Ebolowa to Akom II would be 430 veh/d, including 212 veh/d of normal traffic, 171 veh/d of diverted traffic and 48 veh/d of induced traffic. This total traffic in this direction corresponds to 617 Passenger Vehicle Units (PVUs) per day.

In terms of heavy vehicles (HVs), there would be 184 HVs/d, including 155 HVs from diverted traffic.

The table below shows the traffic forecast in 20 years.

TABLE 38: TRAFFIC TRENDS ON THE EBOLOWA – AKOM II SECTION (EBOLOWA TO AKOM II DIRECTION)

	Year	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL without Moto cycle	HVs	UVP
	2019	**83**	**35**	**13**	**0**	**7**	**0**	**1**	**3**	**142**	11	154
	2024	106	44	17	0	9	0	1	5	182	15	197
	2025	111	47	18	0	9	0	1	5	192	16	207

	Year	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL without Moto cycle	HVs	UVP
	2026	117	49	19	0	10	0	1	5	201	17	218
2027	Normal Traffic	122	51	20	0	11	0	1	5	212	18	229
	diverted	5	10	0	0	22	29	11	93	171	155	330
	induiced	24	10	4	3	2	2	2	1	48	11	58
	Total	**151**	**72**	**23**	**3**	**35**	**31**	**14**	**100**	**430**	**184**	**617**
	2028	159	75	25	6	38	33	15	106	455	197	655
	2029	167	79	26	6	40	35	16	112	480	209	692
	2030	175	83	27	6	42	37	17	119	506	221	730
	2031	184	87	28	6	45	39	18	126	534	235	771
	2032	193	91	30	7	47	42	19	133	563	249	814
	2033	202	96	31	7	50	44	20	141	593	263	860
	2034	213	101	33	7	53	47	22	150	625	279	908
	2035	223	106	35	8	56	50	23	159	659	296	959
	2036	234	111	36	8	60	53	24	168	695	313	1012
	2037	246	117	38	9	63	56	26	178	733	332	1069
	2038	258	123	40	9	67	59	27	189	773	352	1129
	2039	271	129	42	10	71	63	29	200	815	373	1192
	2040	285	135	44	10	76	67	31	212	859	395	1259
	2041	299	142	46	11	80	71	33	225	906	419	1330
	2042	314	149	49	11	85	75	35	239	955	444	1404
	2043	330	156	51	12	90	79	37	253	1008	470	1483
	2044	346	164	54	12	95	84	39	268	1063	499	1566
	2045	363	172	56	13	101	89	41	284	1121	528	1654
	2046	382	181	59	13	107	94	44	301	1182	560	1747
	2047	401	190	62	14	114	100	46	319	1246	593	1846
	2048	421	200	65	15	120	106	49	338	1314	629	1949

5.2.4.1.2 AADT in the direction (from Akom II to Ebolowa)

Assumming that in 2027 the tared road is opened to the circulation, the projected Average Annual Daily Traffic (AADT) from Akom II to Ebolowa would be 438 veh/d, including 208 veh/d of normal traffic, 181 veh/d of diverted traffic and 49 veh/d of induced traffic. This total traffic in this direction corresponds to 582 Passenger Vehicle Units (PVUs) per day.

In terms of heavy vehicules (HVs), there would be 170 HVs/d, including 135 HVs from diverted traffic.

The table below shows traffic trends over the next 20 years.

TABLE 39: TRAFFIC TRENDS ON THE EBOLOWA – AKOM II SECTION (AKOM II TO EBOLOWA DIRECTION)

	Year	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL without Moto cycle	HVs	UVP
	2019	**78**	**36**	**11**	**0**	**8**	**0**	**0**	**6**	**140**	14	154
	2024	100	47	14	0	10	0	1	7	180	19	198
	2025	105	49	15	0	11	0	1	8	189	20	208
	2026	110	51	15	0	12	0	1	8	198	21	219
2027	Normal Traffic	116	54	16	0	12	0	1	9	208	23	230
	diverted	38	9	0	0	23	88	22	1	181	135	291
	induiced	22	10	3	3	3	3	2	2	49	13	60
	Total	**176**	**73**	**19**	**3**	**39**	**91**	**25**	**12**	**438**	**170**	**582**
	2028	185	77	20	4	41	97	26	13	462	180	614
	2029	194	81	21	4	43	103	28	14	487	191	648
	2030	204	85	22	4	46	109	29	15	513	202	683
	2031	214	89	23	4	49	115	31	15	541	215	721
	2032	225	93	24	4	52	122	33	16	570	227	761
	2033	236	98	26	5	55	129	35	17	601	241	803
	2034	248	103	27	5	58	137	37	18	633	255	848
	2035	260	108	28	5	62	145	39	19	667	271	894
	2036	273	113	30	5	65	154	42	21	703	287	944
	2037	287	119	31	6	69	163	44	22	741	304	996
	2038	301	125	33	6	73	173	47	23	781	322	1052
	2039	316	131	34	6	78	184	50	25	823	342	1110
	2040	332	138	36	6	82	195	53	26	868	362	1172
	2041	349	145	38	7	87	206	56	28	915	384	1237
	2042	366	152	40	7	93	219	59	29	964	407	1305
	2043	384	160	42	7	98	232	63	31	1017	431	1378
	2044	404	168	44	8	104	246	66	33	1072	457	1454
	2045	424	176	46	8	110	260	70	35	1130	484	1535
	2046	445	185	48	9	117	276	75	37	1191	513	1621
	2047	467	194	51	9	124	293	79	39	1256	544	1711
	2048	491	204	53	10	131	310	84	41	1324	576	1806

Traffic on the Ebolowa-Kribi section is fairly balanced in both directions.

5.2.4.2 Traffic forecast on Akom II- Kribi road section

On the Akom II-Kribi section, the basis of the projection is the result obtained from counting, given that in the history of counting, there was no counting station on this section. The total projected Average Annual Daily Traffic (AADT) in both directions would be 947 veh/d when the tared road ist put into service in 2027.

5.2.4.2.1 AADT in the direction from Akom II to Kribi

Assumming that in 2027 the tared road is opened to the circulation, the projected Average Annual Daily Traffic (AADT) from Akom II to Kribi would be 476 veh/d, including 253 veh/d of normal traffic, 171 veh/d of diverted traffic and 52 veh/d of induced traffic. This total traffic in this direction corresponds to 736 Passenger Vehicle Units (PVUs) per day.
In terms of HVs, this would mean 248 HVs per day, including 155 HVs from diverted traffic.

TABLE 40 : TRAFFIC TRENDS ON THE AKOM - II KRIBI SECTION (AKOM II TO KRIBI DIRECTION)

	Year	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL without Moto cycle	HVs	UVP
	2024	77	59	17	3	8	9	39	4	217	63	285
	2025	81	62	18	3	9	9	41	4	228	66	300
	2026	85	65	19	3	9	10	44	4	240	70	317
2027	Normal Traffic	90	69	20	3	10	10	46	5	253	75	334
	diverted	5	10	0	0	22	29	11	93	171	155	330
	induiced	17	13	4	2	2	2	11	1	52	18	72
	Total	**112**	**92**	**24**	**5**	**34**	**42**	**68**	**99**	**476**	**248**	**736**
	2028	118	97	25	7	36	44	73	105	504	265	781
	2029	123	101	26	8	39	47	77	111	532	281	826
	2030	130	107	28	8	41	50	81	118	561	298	872
	2031	136	112	29	9	43	53	86	125	592	315	922
	2032	143	117	30	9	46	56	92	132	625	334	974
	2033	150	123	32	9	49	59	97	140	660	354	1030
	2034	158	130	33	10	52	63	103	148	696	375	1088
	2035	165	136	35	10	55	66	109	157	734	398	1150
	2036	174	143	37	11	58	70	116	167	775	422	1215
	2037	182	150	39	11	61	75	123	177	818	447	1284
	2038	192	157	41	12	65	79	130	187	863	473	1357
	2039	201	165	43	13	69	84	138	199	911	502	1435
	2040	211	174	45	13	73	89	146	211	961	532	1516
	2041	222	182	47	14	78	94	155	223	1015	563	1603
	2042	233	191	49	15	82	100	164	237	1071	597	1694
	2043	244	201	52	15	87	106	174	251	1130	633	1790

	2044	257	211	55	16	92	112	184	266	1193	671	1893
	2045	270	221	57	17	98	119	195	282	1259	711	2000
	2046	283	233	60	18	104	126	207	299	1329	753	2115
	2047	297	244	63	19	110	133	219	317	1403	798	2235
	2048	312	256	66	20	117	141	233	336	1481	846	2363

5.2.4.2.2 AADT in the direction from Kribi to Akom II

When commissioned in 2027, the projected Average Annual Daily Traffic (AADT) from Kribi to Akom II would be 471 veh/d, including 240 veh/d of normal traffic, 181 veh/d of diverted traffic and 50 veh/d of induced traffic. This total traffic in this direction corresponds to 661 Passenger Vehicle Units (PVU) per day.

In terms of HVs, we would have 206 HVs/d, including 135 HVs from diverted traffic.

TABLE 41 : TRAFFIC TRENDS ON THE AKOM - II KRIBI SECTION (KRIBI TO AKOM II DIRECTION)

	Year	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL without Moto cycle	HVs	UVP
	2024	75	68	15	2	5	5	35	0	423	48	260
	2025	79	71	16	2	6	6	37	0	217	51	274
	2026	83	75	17	2	6	6	39	0	228	54	289
2027	Normal Traffic	87	79	17	2	7	6	42	1	240	57	304
	diverted	38	9	0	0	23	88	22	1	181	135	291
	induiced	17	15	3	2	1	1	10	0	50	15	65
	Total	**142**	**103**	**21**	**4**	**31**	**96**	**73**	**2**	**471**	**206**	**661**
	2028	149	108	22	4	33	101	78	2	497	218	698
	2029	156	113	23	4	35	108	82	2	524	231	737
	2030	164	119	24	5	37	114	87	2	552	245	778
	2031	172	125	25	5	39	121	92	2	582	260	822
	2032	181	131	26	5	42	128	98	3	614	276	867
	2033	190	138	28	5	44	136	104	3	647	292	916
	2034	199	145	29	6	47	144	110	3	683	309	967
	2035	209	152	31	6	50	153	117	3	720	328	1021
	2036	220	159	32	6	53	162	124	3	759	348	1079
	2037	231	167	34	6	56	171	131	3	801	368	1139
	2038	242	176	35	7	59	182	139	4	844	390	1203
	2039	255	185	37	7	63	193	147	4	890	414	1270
	2040	267	194	39	8	67	204	156	4	939	439	1341
	2041	281	203	41	8	71	216	165	4	990	465	1417
	2042	295	214	43	8	75	229	175	5	1044	493	1496
	2043	309	224	45	9	79	243	186	5	1101	522	1580

	2044	325	236	47	9	84	258	197	5	1161	553	1669
	2045	341	247	50	10	89	273	209	5	1225	586	1763
	2046	358	260	52	10	95	290	221	6	1292	622	1862
	2047	376	273	55	11	100	307	235	6	1363	659	1967
	2048	395	286	58	11	106	326	249	6	1437	698	2077

6 DIFFICULTIES ENCOUNTERED

The main difficulties encountered during data collection were the late start of the O/D and haulier surveys. In fact, despite the presentation of our mission order and the signed service order issued by Ministry of Public Works to ICM, the respondents needed the competent administrative authority to facilitate the introduction of the interviewers by sending a message to the attention of the targeted groups.
When the teams arrived on the field, these authorities were busy with the installation ceremony of the Mvila divisional officer and the fact that Monday 12/02/024 was a public holiday. These events delayed the message conveyed in the division of Mvila and the mobilisation of the forces of law and order for the O/D investigation.
However, in the Ebolowa area, these investigations continued for three days after the required papers had been obtained.

In the Kribi area, it was the photocopy of the discharge for our application submitted to the sub-divisional office that enabled us to survey the transporters.

At the KAP, the team was unable to obtain an interview in the absence of a message from the administrative authority.

CONCLUSION

The traffic study on the Ebolowa-Akom II-Kribi road, which aims to highlight traffic forecasts on this road, was carried out in three phases. One phase was devoted to documentary research, the second to data collection and field surveys, and the third to data processing and report writing.

Data collection made it possible to (i) gather a number of reports and documents relevant to the assignment, (ii) carry out the traffic count and origin/destination survey, (iii) survey transport operators, and (iv) assess travel times in a non-project situation during the dry season. This phase took place from 07/02 to 18/2/2024.
The traffic history obtained from the Ministry of Public Works gives us traffic of 287 veh/d in 2019 between Ebolowa and Kribi, with Ebolowa as the counting station.
The study of the integrated strategy for multimodal infrastructures counted traffic of 787 veh/d on the Kribi - Ebolowa section, with the counting station located in Kribi.

The average traffic counted during the week was 160 veh/d on the Ebolowa-Akom II section, excluding motorcycles, which account for the lion's share of this traffic. On Akom II - Kribi, the average daily traffic counted during the survey period was 423 veh/d.

For the O/D surveys carried out at Mengong, the main origins of travellers are Ebolowa (42%), Sangmelima (33%) and Mengong (14%). Douala and Yaoundé each account for 3% of origins. The main destinations for travellers are Sangmelima (53%), Ebolowa (31%). Yaoundé accounts for 4% of destinations.
The main origins of goods are Sangmelima (52%), Ebolowa (19%), Mengong and Djoum, (11% each). The main destinations for goods are Ebolowa (41%), Sangmelima (26%) and Mengong (22%). Construction materials account for 33% of goods, while logs represent 15%.

Surveys of hauliers show that many of them have abandoned the Ebolowa-Akom II-Kribi line because it is unpraticable in rainy weather, and are prepared to restart if the road is asphalted.

The estimate of diverted traffic was based on O/D surveys and counts carried out in 2018 as part of the development of the Integrated Multimodal Transport Infrastructure Strategy (S2ITM). This shows that in 2018, the traffic coming from or going to the South and neighbouring countries that could be diverted along the route would be 232 veh/d.

The projected Average Annual Daily Traffic (AADT) per road section and per direction when the motorway is brought into service in 2027 is shown in the tables below

AADT by direction and vehicle type on the Ebolowa - Akom II section

DIRECTION	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL without Moto cycle	Total heavy vehicule (HV)
From Ebolowa to Akom II	151	72	23	3	35	31	14	100	430	184
From Akom II to Ebolowa	176	73	19	3	39	91	25	12	438	170
Twoo Directions	**327**	**145**	**42**	**7**	**74**	**122**	**39**	**112**	**869**	**354**

AADT by direction and vehicle type on the Akom II-Kribi road section

DIRECTION	VP	P. Up	M. Bus	A. C	C. 2E	C. 3E	E.Art	Grum.	TOTAL without Moto cycle	Total heavy vehicule (HV)
From Akom II to Kribi	112	92	24	5	34	42	68	99	476	248
From Kribi to Akom II	142	103	21	4	31	96	73	2	471	206
Twoo Directions	**254**	**195**	**45**	**9**	**66**	**137**	**142**	**101**	**947**	**454**

APPENDICES

Administrative documents introducing teams to the various structures

REPUBLIQUE DU CAMEROUN
Paix-Travail-Patrie
****
REGION DU SUD
****
DEPARTEMENT DE LA MVILA
****
PREFECTURE D'EBOLOWA
****
SERVICE DES AFFAIRES ADMINISTRATIVES, JURIDIQUES ET POLITIQUES
****

REPUBLIC OF CAMEROON
Peace-Work-Fatherland
****
SOUTH REGION
****
MVILA DIVISION
****
EBOLOWA SENIOR DIVISIONAL OFFICE
****
SERVICE OF ADMINISTRATIVE POLITICAL AND JUDICIAL AFFAIRS
****

MESSAGE PORTE

N° 2024/027/MP/L.07/SAAJP

ORIGINE : PREFET DEPARTEMENT MVILA

DESTINATAIRES :
- SOUS-PREFETS ARRONDISSEMENTS EBOLOWA I ET II ;
- TOUS RFMO MVILA;
- DD/MINEPAT ;
- DD/MINTP ;
- TOUS CHEFS TRADITIONNELS CORRIDOR ROUTE EBOLOWA -AKOM II - KRIBI AXE MVILA.

MENTION : TRES URGENT

TEXTE : DANS CADRE MISSION ETUDE TRAFIC STOP PREALABLE DEMARRAGE TRAVAUX CONSTRUCTION ROUTE EBOLOWA - AKOM II - KRIBI AXE MVILA STOP PAR ENTREPRISE ICM CONSTRUCTION LIMITED STOP PERIODE ALLANT DU 07/02/2024 AU 18/02/2024 STOP HONNEUR VOUS DEMANDER STOP *PRIMO* STOP BIEN VOULOIR APPORTER APPUI INSTITUTIONNEL DITE EQUIPE STOP *SECUNDO* STOP CHEFS TRADITIONNELS DITS AXES VEILLERONT ENCADREMENT EQUIPE STOP VOUS VOUDREZ BIEN ME RENDRE COMPTE DE VOS DILIGENCES STOP URGENCE ET IMPORTANCE PARTICULIEREMENT SIGNALEES STOP ET FIN. /-

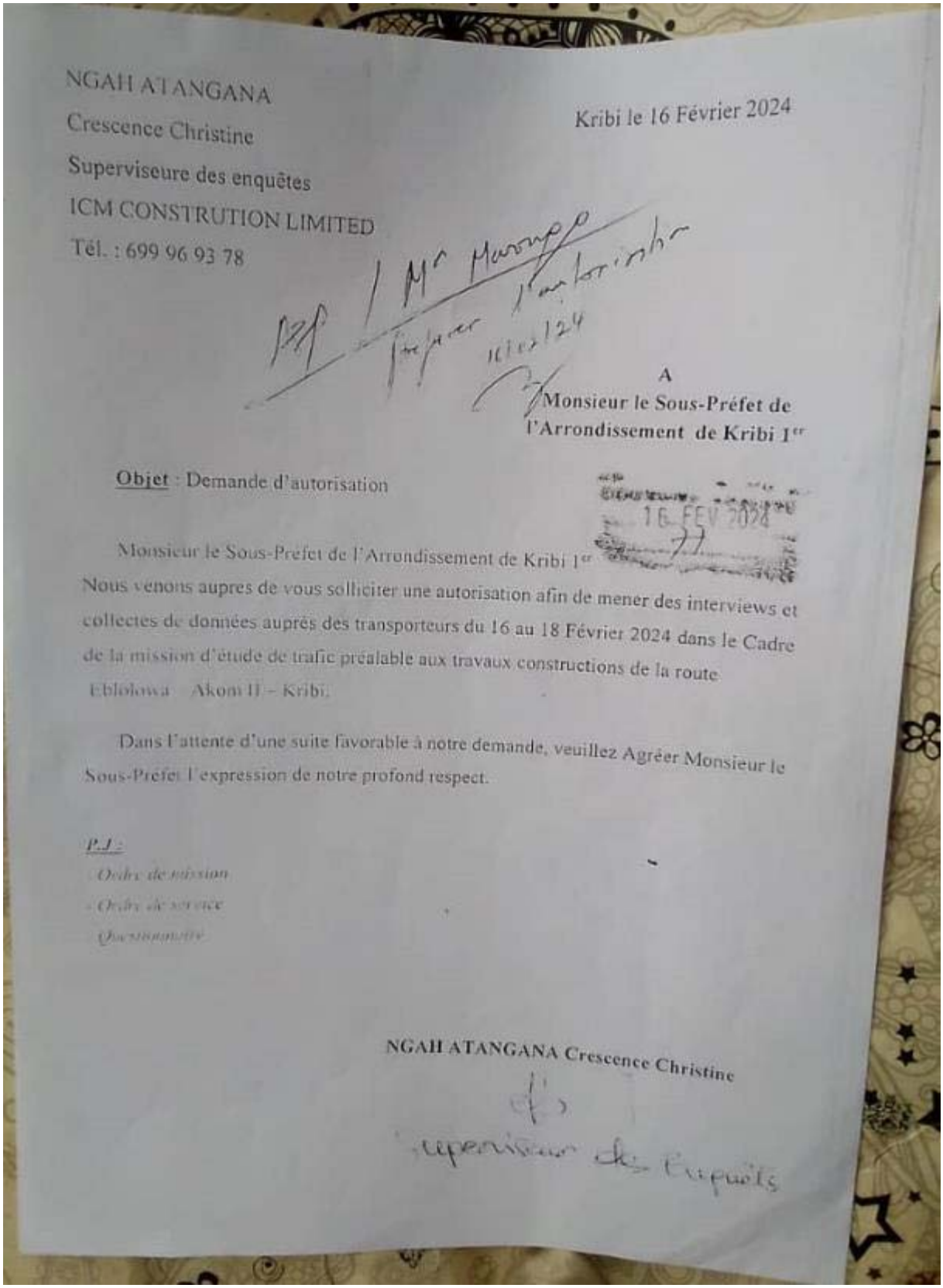
Copie : -GRS/EBWA

VU, BON A PORTER
EBOLOWA LE 15 FEV 2024

TAM LIKENG

Pour le Préfet et par Délégation
Le Premier Adjoint Préfectoral

Administrateur Civil



NGAH ATANGANA
Crescence Christine
Superviseure des enquêtes
ICM CONSTRUTION LIMITED
Tél. : 699 96 93 78

Kribi le 16 Février 2024

A
Monsieur le Sous-Préfet de
l'Arrondissement de Kribi 1er

Objet : Demande d'autorisation

16 FEV 2024

Monsieur le Sous-Prefet de l'Arrondissement de Kribi 1er
Nous venons aupres de vous solliciter une autorisation afin de mener des interviews et collectes de données auprés des transporteurs du 16 au 18 Février 2024 dans le Cadre de la mission d'étude de trafic préalable aux travaux constructions de la route Ebolowa Akom II – Kribi.

Dans l'attente d'une suite favorable à notre demande, veuillez Agréer Monsieur le Sous-Préfet l'expression de notre profond respect.

P.J :
- Ordre de mission
- Ordre de service
- Questionnaire

NGAH ATANGANA Crescence Christine

Superviseur des Enquêtes

Data collection and survey sheets

O/D survey sheet (passenger vehicule)

QUESTIONNAIRE OD VOYAGEURS- PROJET: ETUDE DE TRAFIC SUR LA ROUTE EBOLOWA-AKOM II- KRIBI					
Poste d'enquête		POSTE :			
Sens de circulation		SENS 1 : _____ ☐ SENS 2 : _____ ☐			
Date de l'enquête					
Nom de l'enquêteur					
Type de véhicule					
Voitures particulières /4X4 ☐	*Camionnettes* ☐	*Voitures taxis* ☐	*Minibus* ☐	*Bus-Autocars* ☐	
Interroger le propietaire à défaut le conductuer		**1) Pas de passager : interroger le chauffeur ; 2) Un passager : interroger le passager et le chauffeur ; 3) Plus de deux passagers : interroger deux passagers (pas le chauffeur).**			
Questions				**Réponse**	
				Passager 1	Passager 2
Heure de l'enquête		Notez l'heure :			
Nombre de places assises					
Nombre d'occupants		Chauffeur compris :			
Origine du déplacement	**Lieu de départ**	Ville & pays & Autres (ex : port- aeroport)			
	Indication complémentaire	Grande ville la plus proche			
Destination du déplacement	**Lieu d'arrivée**	Ville & pays & Autres (ex : port- aeroport)			
	Indication complémentaire	Grande ville la plus proche			
Motif du déplacement à destination			Domicile (1)		
			Travail (2)		
			Etudes (3)		
			Marché (4)		
			Autres commerces (5)		
			Familles /amis (6)		
			Loisirs/tourisme (7)		
			Autres (8)		
catégorie socio-professionnelle			Scolaire/Etudiant (9)		
			Commerçant (10)		
			Fonctionnaire / Cadre (11)		
			Ouvrier/employé (12)		
			Artisan (13)		
			Explotant agricol (14)		
			Sans emploi (15)		
			Autres (16)		
Fréquence du trajet ?			fois par jour (17)		
			fois par semaine (18)		
			fois par mois (19)		
			fois par an (20)		
			Exceptionnellement (21)		
			Occasionnellement (22)		

O/D survey sheet (goods vehicules)

QUESTIONNAIRE OD MARCHANDISES- PROJET: ETUDE DE TRAFIC SUR LA ROUTE EBOLOWA-AKOM II- KRIBI				
Poste d'enquête			POSTE :	
Sens de circulation			SENS 1 : _____ ☐ SENS 2 : _____ ☐	
Date de l'enquête				
Nom de l'enquêteur				
Types de véhicules				
Camion 2 essieux ☐	***Camions 3 essieux*** ☐	***Camions Essemble articulé*** ☐	***Grumier*** ☐	
Interroger le chauffeur				
Questions			**Réponse**	
Heure de l'enquête		Notez l'heure		
Nombre d'occupants		Chauffeur compris		
Origine du déplacement	**Lieu de départ**	Ville & pays & Autres (ex : port- aeroport)		
	Indication complémentaire	Grande ville la plus proche		
Destination de déplacement	**Lieu d'arrivée**	Ville & pays & Autres (ex : port- aeroport)		
	Indication complémentaire	Grande ville la plus proche		
Chargement		1. Plein 2. Moitié 3. Vide		
Type de marchandises transportées ?		1. Produits champetres, 2. Véhicules, 3. Materiaux de construction, 4. produits agro-alimentaires, 5.coton, 6. Hydrocarbure, 7. Autres		
Fréquence du trajet ?			fois par jour	
			fois par semaine	
			fois par mois	
			fois par an	
			Exceptionnellement	
			Occasionnellement	

Transporters data collection sheet

TRAFFIC STUDY ON EBOLOWA-AKOM II-KRIBI ROAD SECTION
DATA COLLECTION ON TRANSPORT

Confidentiel: Les informations collectées au cours de cette opération sont strictement confidentielles au terme de la loi N° 91/023 du 16 décembre 1991 sur les recensements et enquêtes statistiques qui stipule en son article 5 que « les renseignements individuels d'ordre économique ou financier figurant sur tout questionnaire d'enquête statistique ne peuvent en aucun cas être utilisés à des fins de contrôle ou de répression économique » et en son article 9 que tout « défaut de réponse ou toute réponse sciemment inexacte sont passibles des peines d'amendes)).

QUESTIONNAIRE

Numéro	Libellé	Réponses
S0Q1	Date de l'enquête	/____/_____/_____/
S0Q2	Nom compagnie	/_____/
S0Q3	Activité principale de l'entreprise 1 : Transport 2 : Autre : définir	/_____/
S0Q4	Nom de l'enquêteur	/_____/
S0Q5	Code du questionnaire	/_____/
S0Q7	Type de transport	a= transport de personne----------/____/ b= Transport de marchandises ---/____/ c= Transport pour compte propre /____/
S0Q8	Nombre de véhicules	a= véhicule transport de personne /____/ b= véhicule Transport de marchandises /____/
S0Q9	Principales destinations	a= ----------/__/ b= ---------- /__/ c= ----------/__/ d= ----------/__/ d= ---------- /__/ f=----------/__/ g= ---------- /__/ h=---------- /__/
S0Q10	Temps de parcours indicatif pour chaque destination	a= ---------- /__/ b= ----------/__/ c= ----------/__/ d= ----------/__/ d= ----------/__/ f=----------/__/ g= ----------/__/ h=---------- /__/
S0Q11	Tarif moyen par destination transport de personnes	a= ----------/__/ b= ---------- /__/ c= ----------/__/ d= ----------/__/ d= ----------/__/ f=----------/__/ g= ---------- /__/ h=----------/__/

S0Q12	Tarif moyen par destination transport de marchandises	a= ----------/__/ b= ---------- /__/ c= ----------/__/ d= ----------/__/ d= ---------- /__/ f=---------- /__/ g= ---------- /__/ h=---------- /__/
S0Q13	Itinéraire actuel	a= ----------/__/ b= ---------- /__/ c= ----------/__/ d= ----------/__/ d= ---------- /__/ f=---------- /__/ g= ---------- /__/ h=---------- /__/
S0Q14	Nouvelles destinations après bitumage de EBOLOWA - AKOM II-KRIBI	a= ----------/__/ b= ---------- /__/ c= ----------/__/ d= ----------/__/ d= ---------- /__/ f=---------- /__/ g= ---------- /__/ h=---------- /__/
S0Q15	Autre problèmes de transport rencontré	a= ----------/__/ b= ---------- /__/ c= ----------/__/ d= ----------/__/ d= ---------- /__/ f=---------- /__/ g= ---------- /__/ h=---------- /__/