

In a context of rapid economic and demographic growth, Yaoundé is tackling the most pressing issues and has adopted a coherent plan to renovate the road network, a prerequisite for the development of public transport and for better use of public space

Key facts

City, Country	Yaoundé, Cameroon
Population	4.1 million (2020, functional urban area)
Growth rate	3.5%
Land area	Administrative limits: 304 km ² Urbanised area: 183 km ²
GDP per capita	1,529 \$ (2018, Cameroon)
Baseline motorization rate ¹	58 cars per 1000 inhabitants 18 motorbikes per 1000 inhabitants
Annual transport emissions per capita ²	241 kg CO _{2eq}
Local Partner (organization)	Urban Community of Yaoundé (CUI)
Implementing partners	Agence Française de Développement (AFD), Codatu
Donors supporting technical assistance for SUMP	French Facility for Global Environment (FFEM)
Amount in technical assistance	Approximately €350,000 ³
SUMP implementation timeline	Joined MobiliseYourCity in November 2016 MobiliseDays in June 2016 Start of SUMP in March 2018 SUMP completed and approved in September 2019
SUMP Vision	No concise vision formulated
Approximate Total SUMP Investment Requirement (CAPEX/OPEX)	CAPEX by term <ul style="list-style-type: none"> • 298,1 M€ (2025) / 554,7 M€ (2035) Yearly OPEX to term <ul style="list-style-type: none"> • 15 M€ (2035) Total CAPEX & OPEX requirements by 2030 <ul style="list-style-type: none"> • CAPEX: 550 M€ • OPEX: 151 M€ • Total CAPEX and OPEX: 701 M€

1 For comparison with motorisation rates in European capital cities, Berlin has a motorisation rate of 330 car per 1000 inhabitants, and other capital cities in Austria, Belgium, Denmark, France, Hungary, Ireland and the Netherlands have a motorisation rate under 450 cars per 1000 inhabitants. Source: Eurostat Regional Yearbook 2020.

2 For comparison, the annual transport (except air travel) emissions per capita in Germany are 1.61 tCO_{2eq}. Source: Die Umweltwirtschaft in Deutschland: Entwicklung, Struktur und internationale Wettbewerbsfähigkeit. www.umweltbundesamt.de

3 From a FFEM envelope of 2 M€.

Diagnosis: Urban Mobility in Yaoundé

Like many other major cities in sub-Saharan Africa, Yaoundé is experiencing rapid population growth. The metropolis suffers from a lack of mobility infrastructure and the financial resources to properly maintain what it has, whether it is the public transport network, the organisation of small-scale transport offer, parking facilities or even simply roads and pedestrian areas. The economy of the city suffers from the lack of infrastructure, and struggles to attract investors.

Following the current evolution of rapid urban growth, the population will reach 5.5 million inhabitants in 2035, and the urban area will reach a radius of 25 km by the end of the century. The increase in the demand for travel, and in the rate of motorisation accompanying the rise in income, may rapidly lead to the saturation of the existing system. Hence, travel times will increase significantly along with the overall cost of travel, due to the consumption of more fuel by private vehicles and taxis.

1. Existing mobility and transport services

The transport system in Yaoundé, while being relatively fluid, is accident prone, uncomfortable, polluting, and expensive for the population.

There are about 8 million of trips travelled every day, from which one third are short distance trips travelled by walking or by moto-taxis. For longer trips, taxis, motorbikes, and cars are the main modes of transport. Official bus service and informal minibuses currently only play a minor role.

All these modes of transport use the same poorly maintained road network, where only 300 km from 2700 km of roads are asphalted. The state of the road network limits both private and public transport. In particular, it suffers from the following problems:

- Most of the secondary and local roads are unasphalted.
- Main and metropolitan roads are not optimally laid out and do not provide for the sharing of the road network between low-capacity modes and high-capacity modes (bus) and soft modes
- Degraded road surfaces or unmanaged intersections create traffic bottlenecks.
- Vehicle, including freight vehicles are parked on the road.
- Geographical elements and neighbourhoods that are densely built on several km² without wide roads constitute obstacles to transit traffic of cars and public transport.

Walking: 4 million trips travelled every day by pedestrians and walking is the main mode of transport. However, the lack of sidewalk combined with a chaotic traffic poses a threat to pedestrians' safety, and they are particularly exposed to traffic accidents.

Taxi service: Less than 5% of vehicles are taxis, but they have a 38% share of the modal split by distance. They transport all categories of the population, and with an average occupation rate of 3 passengers, they are the main motorized mode of transport. Taxis, even used collectively, are relatively expensive: for one passenger out of four, taxi fares only represent over 15% of their household income.

Moto-taxis: Moto-taxis are particularly present in the outlying districts. Their flexibility and agility allow them to use roads that are unpracticable for other vehicles, due to the poor state of the pavement or the narrowness of the road. Moto-taxis, often operated informally by very young drivers, are notably resistant to any regulation, which is nevertheless necessary to address the safety issues associated with this mode of transport.

Private cars: cars are handicapped by the state of the road network and only 10% of trips are made by private cars. The car ownership rate, which is highly dependent on household income, is nevertheless increasing along with the standard of living.

Informal minibuses: Informal minibuses are of lesser importance in comparison to other African cities. In

Yaoundé, they are mainly used for transport between the centre and the periphery, following fixed routes and departing from bus stations.

Formal buses: A formal bus service is available through the private company Stecy and is growing, but remains a minority element in the current mobility landscape. No facilities are in place to encourage this mode of transport. Buses travel on the same roadway as other vehicles and suffer from congestion and low commercial speed.

2. Environmental challenges

The vehicle fleet is very old (20% of vehicles are over 20 years old) and is very polluting, emitting large amounts of greenhouse gases and air pollutants.

Internal trips within the CUY emit the equivalent of 635 ktCO₂ per year. Along with distances travelled by vehicles, emissions follow a strong growth. Unfortunately, the gradual improvement in the performance of the vehicle fleet linked to its renewal does not counterbalance this trend.

In a list of 54 countries, Cameroon ranked 15th among the most polluted countries in Africa in 2017. While the average concentrations of pollutants are not sufficiently documented, punctual measurements have observed peak concentrations of fine particulate matters PM_{2.5} that were one hundred times higher than the WHO standard.

3. Safety and comforts are key issues to be addressed

Safety is a major issue for mobility in Yaoundé, where accidents cause around 1,000 deaths and 5,000 serious injuries per year. A specific study on a sample of taxi drivers revealed that 73% of them had an accident in the two previous years. In addition to accidents, inquired passengers raised the issue of the risk of assault in taxis.

Comfort is also often a problem: long waits in hot or rainy environments, difficulty in finding an available taxi in certain areas, or vehicles overloaded with passengers and goods.

4. Gender disparities, women travel less and use less comfortable modes of transport

The diagnosis describes a slight difference in the number of journeys made by women, which can be linked to significant disparities in terms of full-time formal employment (15% of women compared to 27% of men). Compared to men, women in Yaoundé make half as many journeys using private cars but travel more by foot or on moto-taxis.

5. The high cost of transport puts low income users under pressure

After housing and food, transport is the third largest item of expenditure for Yaoundé residents and accounts for more than 11% of household spending. This is particularly critical in this city where inequalities are extremely high, and the highest 20% of incomes are on average more than 7 times higher than the bottom 20%.

The high cost of transport is attributed to the low efficiency of minibuses, taxis, and motor taxis, linked with a poor road network, and the weakness of public transport offer.

6. Institutional and financial capacity of the CUY: a gap remains between mandate and resources

The Urban Community of Yaoundé is the transport organising authority, both legally and in practice.

However, in spite of notable capacities, the CUY does not currently have the institutional means nor the adequate human resources to perform some of the essential tasks assigned to it by law, including the following: (i) the organisation and management of public transport, (ii) the traffic and parking management, and (iii) continuous monitoring of performance the urban transport system and the quality of service provided to citizens.

As the majority of the city will develop outside the administrative boundaries of the CUY by 2035, the municipal authorities, i.e. the CUY and the peripheral municipalities will have to develop together an integrated organisation for public transport and define a structuring infrastructure network and priority multimodal investment plans on

the scale of the future large conurbation.

In total, financial resources allocated to the construction and maintenance of roads, nearly 40 M€ per year, are in line with expectations based on the economic status of the city and country. However, the CUY has an insufficient share of these resources in perspective of its mandate. The national level compensates financially with its much greater resources and the support of international donors, but coordination is insufficient between the city and the ministries responsible for urban development and public works.

The SUMP preparation process and stakeholder involvement

In order to take the future urban development into account, the perimeter of the study covers a surface of about 700 km², from which 304 km² are within the administrative boundaries of the city.

Throughout the process of developing the SUMP, the various stakeholders involved in mobility were associated through technical committees, specific exchange workshops, and bilateral meetings.

The technical committees gathered the Yaoundé Urban Community, the Ministries of Urban Development, Transport, Public Works, Economy and Planning, Environment, the Police, the various taxi, and motorbike taxi unions, the Stecy bus company and the French Development Agency (AFD).

Specific workshops in small groups linked representatives of the technical committee with academics, officials from the local districts, rail transporters, and managers of places that generate large amounts of travel such as markets. These workshops enabled the different actors to take sufficient ownership of the approach.

In addition to the members of the technical committee, the team in charge of developing the SUMP also met bilaterally with international donors and representatives of the local districts.

Three time-horizons were considered:

- A. The very short term: horizon of 1 to 2 years in order to highlight quick wins
- B. The medium term: horizon of 5 to 7 years in order to observe the effects of the first SUMP measures.
- C. The long term: horizon of 15 years to aim at significant results, to anticipate possible needs for reorientation.

Vision setting and definition of scenarios

Strategic Vision

The SUMP of Yaoundé does not propose clear vision and goals for urban mobility in the city. However, it fully adopts the EASI framework and puts a strong emphasis on identifying challenges and solutions. Challenge-related objectives of the SUMP are:

- Improving traffic conditions by developing a network of roads beneficial to all.
- Reducing the cost of mobility supported by households
- Improving the quality of life in the city with a less dangerous and less polluting system



How does the SUMP adopt the EASI framework?

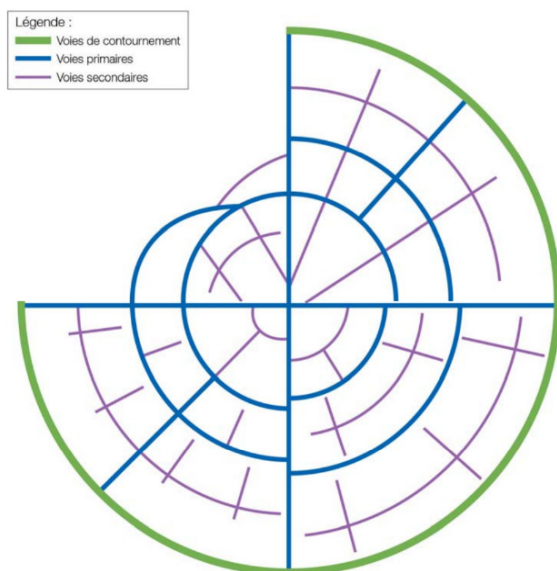
ENABLE - Improvement of steering and financing

AVOID - Transit Oriented urban Development, urban densification, densification around developing mass transit routes

SHIFT - Multimodal transport scheme, complementarity of transport modes

IMPROVE - Optimisation of the road network and improvement of the vehicle fleet

- Developing main roads
- Sharing space
- Traffic regulation
- Renewing the vehicle fleet towards less polluting and lower emissions.



The SUMP develops the concept of coherent road network: The Cross.

The network builds up on existing roads and makes use of north-south and east-west metropolitan axes, and of multiple hierarchical levels of roads.

The road infrastructure will provide an efficient inclusion of the bus offer, for example with reserved lanes on congested sections.



Test scenarios and selected scenario

Three specific scenarios were defined in order to assess the impact of the SUMP by 2025 and by 2035, each one developed with a different level of ambition.

Baseline scenario: no SUMP implementation takes place, but existing laws and regulations are implemented. Private car ownership will increase, and the modal share of public transport will decrease. Travel times are expected to increase sharply, especially due to the increasing congestion in the capital.

Central scenario: this scenario provides immediate solutions to issues related to the road network. It is an ambitious infrastructure project focused on increasing the capacity of the roads to accommodate increased private vehicle traffic. However, with the appropriate road layout and the establishment of mass transport lines, this scenario allows for a significant shift to public transport, whose modal share is expected to evolve positively.

Ambitious scenario : The ambitious scenario also includes an important road infrastructure component in the short term, but focuses more on the creation of mass transport lines, including a train-tram project by 2035.

The scenario finally selected is the **Central scenario**. This scenario aims at the completion in the short term (2025) of a more efficient, adequate, and structuring road network. A public transport offer will also be put in place, but on a reduced number of lines, aiming at a good level of service and reliability, an offer that is affordable for the user and financially balanced. After having proven its effectiveness and relevance and gotten the adhesion of users, the public transport offer can be extended and replicated on a larger scale according to a level of ambition yet to be defined. Indeed, the current measures respond to imperative needs but will not make it possible to meet all the long-term challenges, particularly the reduction of greenhouse gas emissions. The SUMP therefore recommends a reassessment in 2025 and envisages an increase in ambition in terms of public transport in the long term.

Key SUMP measures

Measures	Cost estimates in M€	Proposed Financing Source	Implemented by
Total cost	891.9 M€		
Physical investments, infrastructure and rolling stock	SUBTOTAL: 852.8 M€		
Bypass roads	2025: 157 M€ 2035: 304 M€	Domestic financing / No international financing identified	2025 2035
Primary roads	2025: 29.7 M€ 2035: 94.5 M€	Domestic financing / No international financing identified	2025 2035
Secondary roads	13 M€	Domestic financing / No international financing identified	2035
Intersections and road measures	2025: 51.5 M€ 2030: 19.8 M€	AFD	2025 2030
Space for pedestrians, including the pilot neighbourhood "Coeur de Ville"	2020: 5 M€ 2035: 1.4 M€/year	AFD	2020 2035
Public transport lines (bus and minibus) and related road facilities	2025: 54.9 M€ 2035: 102.4 M€	Domestic financing / No international financing identified	2025 2035
Additional studies and plans	SUBTOTAL: 28.7 M€		
Studies and support reorganisation plan for bus lines	2025: 9.7 M€ 2035: 19 M€	Domestic financing / No international financing identified	2025 2035
Regulation, institution and policy reforms	SUBTOTAL: 10.4 M€		

Informal transport project			
Reform of the taxi and moto-taxi systems			
Continuous formalisation of moto-taxis and informal buses through the establishment of a new institution responsible for vocational training, schedules regulation, the administrative formalisation.	4.5 M€	European Union	2024
Institutional reforms: creation of a local commission and a technical service for mobility	2.1 M€	Domestic financing / No international financing identified	2020
Control and training centre for mobility and transport	3.8 M€	Domestic financing / No international financing identified	2023

Projected results and impact

The implementation of the measures identified in the SUMP is expected to lead to a significant impact in terms of GHG emission reduction, improvement of the modal share of sustainable transport modes, and more. The following table presents the expected results and impact.

Impact Area	Expected Impact						
GHG emission (SDG 11)	Projected emissions in absolute value:						
		Baseline 2018	BAU 2025	SUMP 2025	BAU 2035	SUMP 2035	SUMP vs BAU 2035
	Per capita	241 kg CO _{2eq}	284 kg CO _{2eq}	251 kg CO _{2eq}	367 kg CO _{2eq}	271 kg CO _{2eq}	-26.16%
	Total	0.78 Mt CO _{2eq}	1.14 Mt CO _{2eq}	1.01 Mt CO _{2eq}	2.00 Mt CO _{2eq}	1.48 Mt CO _{2eq}	-26.00%
	Projected increase of annual GHG emissions by 2029, in percentage of the baseline:						
	▪ Business-as-usual scenario: +101%						
	▪ SUMP scenario: +59%						
Accessibility (SDG 11)		Baseline 2018	BAU 2025	SUMP 2025	BAU 2035	SUMP 2035	
	Total population covered	2,212,283	4,028,557	4,028,557	5,599,757	5,599,757	
	Population at 500m or less of public transport stops	1,350,000	1,415,700	1,405,500	1,528,900	1,888,600	
	% Access	42%	35%	35%	27%	34%	
Air pollution (SDG 11)	Improved but not quantified						
Modal share	Percentage of total trips being realized with Public Transport						
		Baseline 2018	BAU 2025	SUMP 2025	BAU 2035	SUMP 2035	
	Modal share of Public Transport	2%	1%	9%	2%	19%	
	Modal share of walking and cycling	32%	31%	34%	29%	35%	
	Total	34%	32%	43%	31%	54%	
Road safety (SDG 3)		Baseline 2018		SUMP 2025		SUMP 2035	
	Deaths	1000		800		500	
	Heavily wounded	5000		4000		2500	

Mobilized finance (SDG 17)	<ul style="list-style-type: none"> • 66 M€ - Secured international grant from AFD for “Yaoundé Coeur de Ville” project. • 2 M€ - Secured grant for the implementation of SUMP governance measures, including the creation of a Transport Organising Authority, an Urban Planning Agency, and the formalisation of moto-taxis and informal buses through outreach (European Union)
Expected institutional impact	The measures identified in the SUMP are complemented with a National Urban Mobility Policy, adopted in parallel to the SUMP process.

Lessons learned

On the occasion of the 3rd MobiliseYourCity conference in Yaoundé in 2019 and the official presentation of the SUMP, a reflection group⁴ composed of different stakeholders proposed areas for improvement for future SUMP, particularly on the African continent.

I. Placing the project owner at the centre of the SUMP process is important: authorities responsible for mobility should lead the planning process, with the support of MobiliseYourCity partners.

Recommendation: When drafting the ToRs, clearly state the role of the responsible local authorities in project ownership and ensure their capacity to monitor the process.

II. Ambitious surveys such as “household travel surveys” are expensive, are sometimes not adapted to the local context and available resources, and can produce unreliable data.

Recommendation: Demographic surveys (with car and two-wheeler motorisation rates) can be carried out on the basis of existing national surveys. They should be supplemented by origin-destination surveys (such as a simplified household survey, or road corridor and public transport network surveys) and qualitative socio-anthropological fieldwork to better capture the individual and collective factors behind the behaviour of respondents in terms of urban mobility. These two methodologies can be complementary and origin-destination surveys would allow the rapid identification of large masses of journeys.

III. Predictive traffic models are expensive to develop, can create the illusion of a “scientific” approach and may generate a gap between their results and their real appropriation by technicians and local elected officials.

Recommendation: Limit the use of models, base them on the observation and expertise of local counterparts and consultants (expert opinion). The SUMP must help identifying “strong lines”, a concept that does not necessarily lead to the choice of one mode rather than another, and to use the models in a second stage, like during pre-feasibility studies.

IV. The link between transport and urban planning is insufficiently considered, even though transport planning documents can be used as a lever for the implementation of other types of plans.

Recommendation: Strengthen local project management, institutional structuring, and governance, build capacities of local contracting authorities, and provide them with a framework for steering the implementation of SUMP action plans. When master plans exist for urban planning in African cities, they should be included in the terms of reference of the SUMP, even if their application is limited to a limited number of projects. Work done at national level (NUMP) should contribute to providing a legislative and legal framework and sources of funding.

⁴ Reflection group led by CODATU: Patrice Berger and Thibaut Descroux (UrbanLyon), Thierry Goin (CEREMA), Marie Dois (consultant), Philippe Bossuet (SYTRAL), Jean-Jacques Helluin, Mael Martinie, Sofia Martin, Antoine Clémot (CODATU).