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Public transport by bus in Ouagadougou: An analysis of the challenges and issues

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Abstract
Public transport is a fundamental issue in the urban dynamic of Ouagadougou, a city where the majority of journeys are made on foot or by two-wheeler. This article analyses the challenges and issues of public bus transport in the capital of Burkina Faso. Through a survey of students, the study sheds light on users' perceptions of these aspects. SOTRACO, the main bus operator, faces a number of challenges, particularly in terms of punctuality, network reliability, comfort and service efficiency. The results show that 84% of people surveyed consider bus punctuality to be unsatisfactory, which is holding back the adoption of this mode of transport. However, the low frequency of bus breakdowns was seen as an advantage by 62% of users. Road congestion and safety are other important issues, although they are often underestimated. The analysis also highlights the fact that modernising infrastructure and raising user awareness could improve the attractiveness of buses in Ouagadougou. Finally, this study suggests ways of optimising the public transport network and increasing its take-up, such as introducing bus-only corridors and better network management.

Keywords: Urban mobility, public transport, bus, SOTRACO, Ouagadougou

Introduction

Urban transport is a crucial issue for cities around the world, given the rapid growth in urban populations and the challenges this brings in terms of mobility, pollution and sustainability. On a global scale, unbridled urbanisation is accompanied by a growing demand for transport solutions that are efficient, accessible and environmentally sustainable. In major cities, the issue of public transport, and in particular the use of buses, is emerging as an alternative to private modes of transport, such as private cars, whose ecological footprint and economic costs are constantly growing (Vuchic, 2007) [14]. Against this backdrop, cities are increasingly looking to strengthen their public transport systems to meet urban mobility needs and limit the negative externalities associated with transport.

On a global scale, urban transport systems face a series of interconnected challenges. The first is road congestion, which has become a major problem in major conurbations. According to the International Association of Public Transport (UITP), in several major cities in America, Asia and Europe, congestion costs billions of dollars annually in terms of lost productivity, excessive fuel consumption and time lost in traffic jams (UITP, 2015) [6].

In Africa, urban transport is of particular importance, as the continent is experiencing some of the fastest urban growth in the world. This rapid expansion poses major challenges for transport infrastructure, which is often insufficient to meet the needs of growing populations.

Despite efforts to develop appropriate urban transport solutions, the majority of African cities are still faced with limited infrastructure, poor management and unequal access to public transport services. In several capital cities, formal transport systems, including buses, coexist with an informal network, notably made up of shared taxis, minibuses and motorbike taxis, which fill the gaps in public transport (Kumar & Barrett, 2008) [7]. However, these informal modes of transport, which are often poorly regulated, contribute to an increase in greenhouse gas emissions and growing road insecurity (Salon & Gulyani, 2010).

Initiatives have nevertheless been taken to modernise public transport systems, notably through investment in bus and BRT infrastructure. Cities such as Lagos (Nigeria) and Dakar (Senegal) have taken steps to develop bus rapid transit systems to meet the growing need for urban mobility (Stojanovski, 2013) [13].

Burkina Faso, a landlocked country in West Africa, faces similar challenges in terms of urban transport, exacerbated by population growth and scarce financial resources. Ouagadougou, the country's capital, with a population of 2,453,496 in 2019 (INSD, 2020), is undergoing rapid urbanisation. Between 1960 and 2019, its population increased by a factor of 40.89 (Zoma & *al*., 2022) [16, 17].

Public transport in Ouagadougou is mainly provided by the Société de Transport en Commun de Ouagadougou (SOTRACO), which is the only formal urban bus operator. SOTRACO aims to meet the growing need for mobility in a city where the majority of journeys are made on foot or on two-wheeled vehicles (motorbikes, bicycles). Although SOTRACO's bus network has been extended, it still faces major challenges.

In a context where urban challenges are multiplying, the optimisation of public transport systems in Ouagadougou, particularly that of SOTRACO, appears to be a priority. The aim of this study is to analyse the challenges and issues facing public bus transport in Ouagadougou.

Methodological approach

The study took place in Ouagadougou, the capital of Burkina Faso, located in the Centre region (figure 1).

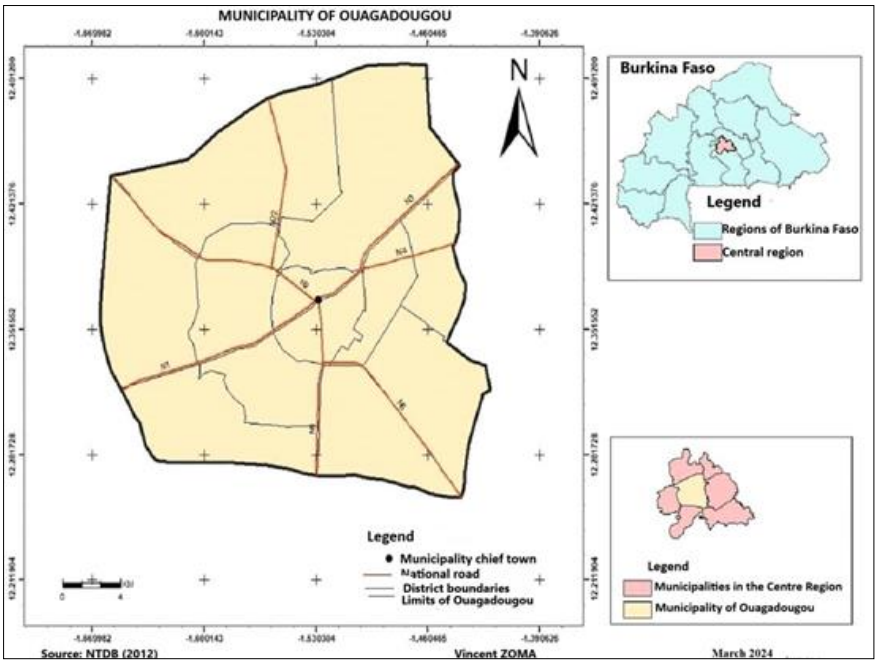


Fig 1: Map of the municipality of Ouagadougou

Ouagadougou has a public transport network managed by the Société de Transport en Commun de Ouagadougou (SOTRACO), the total length of which, as at 30 September 2022, was 468.45 km, covering an area of 520 km², with a coverage rate of 86.07 km². Figure 2 illustrates the different urban bus networks serving the city.

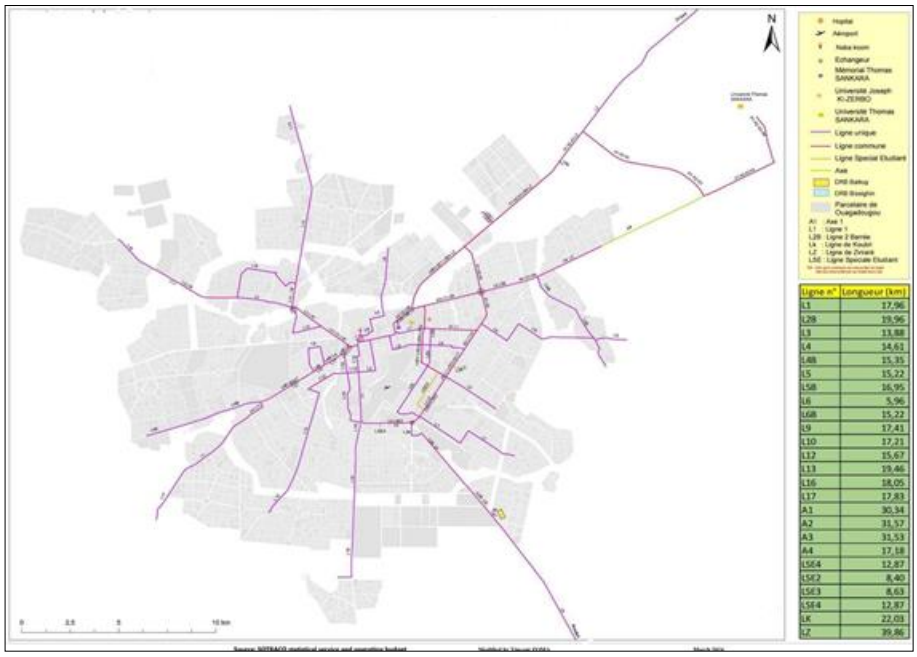


Fig 2: Ouagadougou urban bus network

The transport network comprises eighteen lines, fifteen of which are currently operational, covering 252.05 km, as well as two inter-municipal lines totalling 83.4 km. In addition, seven special lines, covering 133 km, serve key routes. The network includes three central termini (Naaba-Koom, Mémorial Thomas Sankara and Ouaga Inter) and twenty peripheral termini. Two bus depots (DRB), at Balkuy and Bissighin, maintain the vehicles. The network also has 1,139 stops, 64 of which are equipped with bus shelters or benches (SOTRACO, 2023).

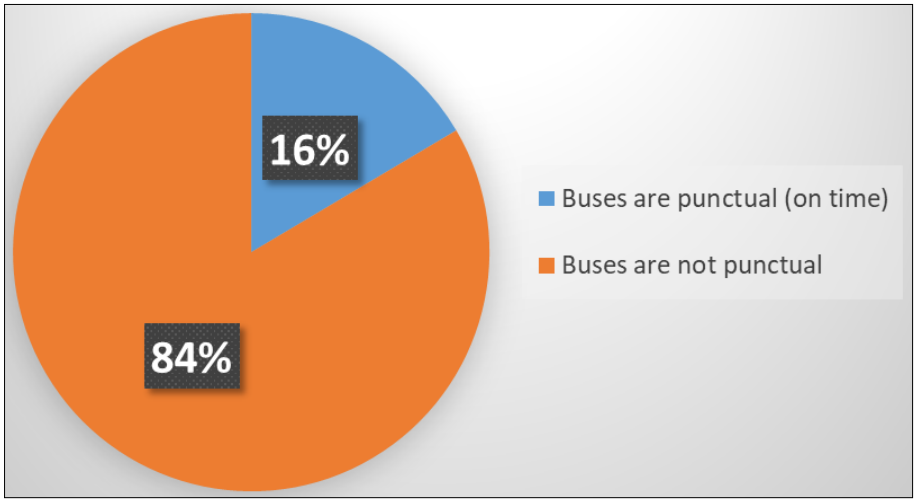
The research, carried out in November 2023, was based on a mixed approach, combining quantitative and documentary methods. On the one hand, a survey was carried out among 100 students selected on a reasoned, non-probabilistic basis, bearing in mind that the majority of current bus users are pupils and students. In fact, according to a report by the Ministry of Transport, Urban Mobility and Road Safety (2019), 86% of SOTRACO users in 2017 were pupils and students. Of the 100 people surveyed, 97 responded to the questionnaires, providing a solid basis for this analysis. The aim of the questionnaire was to gather students' opinions on how SOTRACO operates.

In addition, the quantitative analysis was enriched by an in-depth literature search, in order to shed light on the challenges and prospects associated with bus use in Ouagadougou.

Results and discussion

Insufficient bus punctuality: An obstacle to the development of public transport

Punctuality is a decisive criterion when choosing a mode of transport, especially in an urban context where time management is crucial. In Ouagadougou, this dimension is particularly relevant, given that public transport is still in its infancy in the face of the overwhelming dominance of two-wheelers, which have remained the preferred means of transport for city dwellers for decades. According to data collected in November 2023, the punctuality of buses operated by the Société de Transport en Commun de Ouagadougou (SOTRACO) leaves much to be desired: only 16% of users think that buses keep to their timetables, while 84% of respondents complain about frequent delays (figure 3).



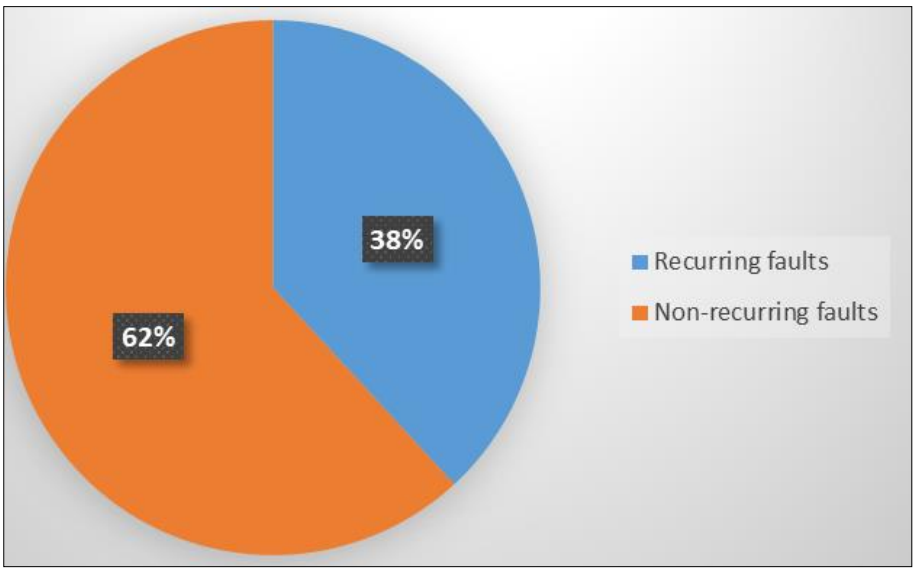
Source: fieldwork (November 2023)

Fig 3: Assessment of bus punctuality

The figures in Figure 3 highlight a structural weakness that discourages residents from using this mode of transport. According to Levine Jonathan & Garb (2002) [8], punctuality is a sine qua non for the attractiveness of public transport, as it directly influences perceptions of efficiency and reliability. In Ouagadougou, the irregularity of timetables reinforces the preference for two-wheelers, perceived as a faster and more flexible mode of transport. As Beaudoin & *al*. (2015) [1] point out, an unreliable public transport offer leads to a drop in ridership and generates negative externalities such as increased congestion and air pollution.

Low recurrence of bus breakdowns: A moderate advantage for the adoption of public transport

While punctuality is criticised, it should be acknowledged that the mechanical reliability of buses is a relative positive point. According to the data collected, 62% of the users questioned believe that bus breakdowns are rare, while 38% consider them to be recurrent (figure 4).



Source: field work (November 2023)

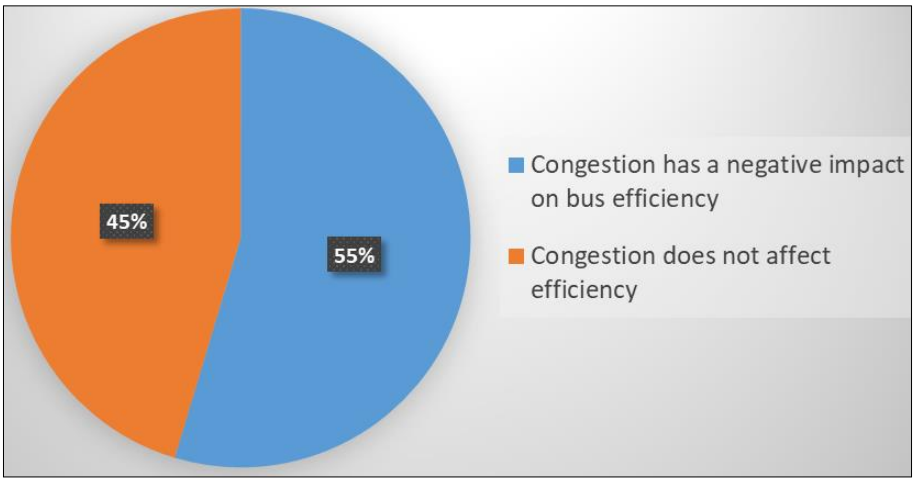
Fig 4: Perception of the recurrence of breakdowns in current bus operation

This satisfaction rate (62%) suggests that, from a technical point of view, buses are not perceived as failing, which could, in theory, encourage more people to use this mode of transport.

However, as Litman (2020) [9] points out, the technical reliability of a transport system is not in itself sufficient to guarantee mass adoption. The punctuality and frequency of journeys, combined with other factors such as comfort and safety, are also major determinants. So, although the low frequency of breakdowns is an asset, its effect on the overall attractiveness of the bus remains limited in the context of the city of Ouagadougou.

The impact of road congestion on the efficiency of the bus service

Road congestion is a major problem in African cities, and Ouagadougou is no exception. Traffic jams considerably slow down bus services, affecting not only punctuality but also user satisfaction. The results of the survey show that 55% of respondents believe that congestion reduces bus frequency and lengthens journey times, while 45% do not share this view (figure 5).



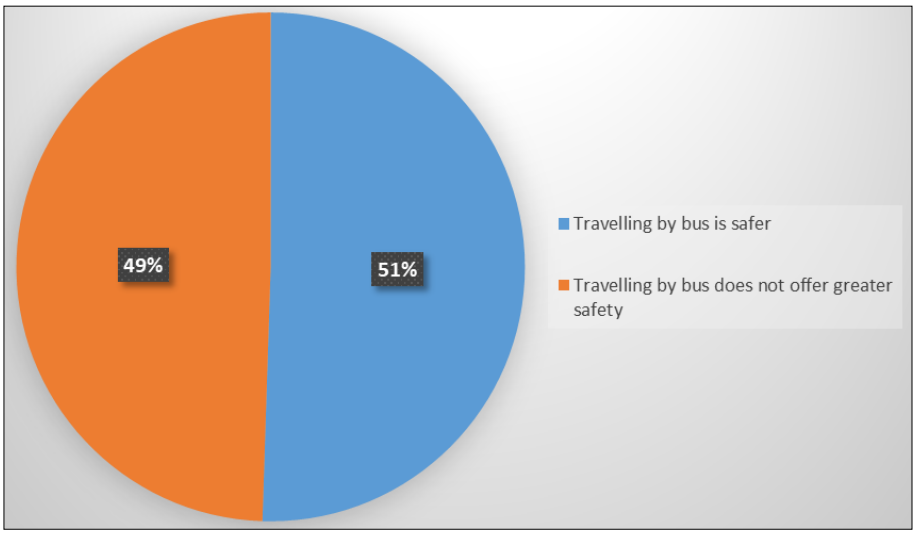
Source: field work (November 2023)

Fig 5: Perceptions of the influence of congestion on bus efficiency

This deterrent effect of congestion on the efficiency of public transport has been widely documented in the literature. Newman and Kenworthy (2015) [11] point out that congestion reduces the attractiveness of public transport, as it creates stressful and unpredictable travel conditions. In Ouagadougou, where the motorbike is perceived as a faster way of getting around traffic jams, the bus loses competitiveness. To overcome this disadvantage, many cities around the world have introduced Bus Rapid Transit (BRT) corridors, which help to limit the impact of congestion. A similar solution could be envisaged in Ouagadougou to improve the efficiency of the service.

Increased bus safety: An advantage that is still underestimated

Safety is also a crucial factor when choosing a mode of transport. In a context where road accidents are frequent, the bus could represent a safer alternative compared with motorbikes, which are widely used in Ouagadougou. However, the survey shows that 51% of respondents are not yet aware of this advantage, while 49% believe that the bus is indeed a safer means of transport (Figure 6).



Source: fieldwork (November 2023)

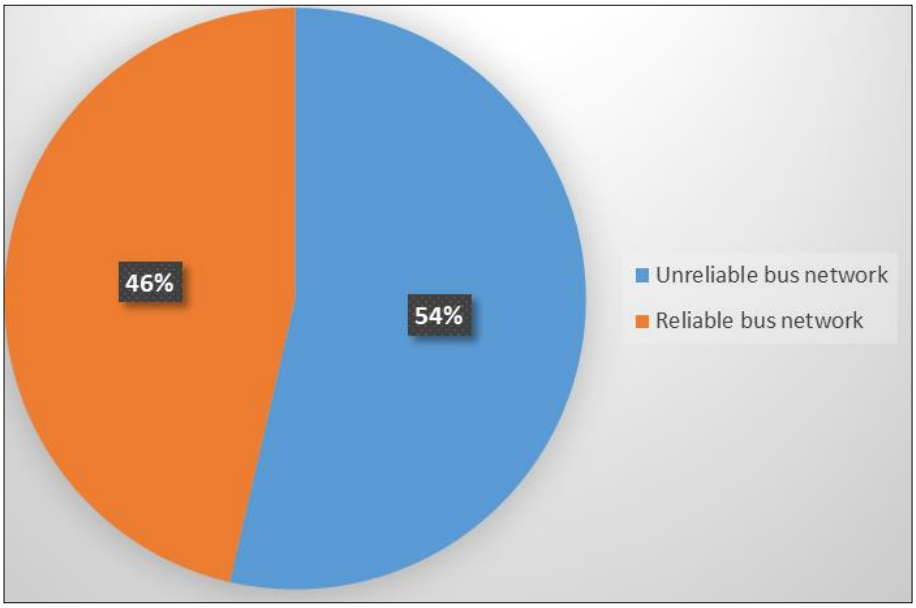
Fig 6: Appreciation of the safety offered by the choice of using the bus

Studies on road safety in developing countries confirm that individual motorised modes of transport, such as two-wheelers, are involved in a significant proportion of serious accidents (WHO, 2018) [15]. According to Zoma (2022) [16, 17], a reduction in the use of motorbikes in favour of buses could combat air pollution linked to the urban transport

sector and considerably improve road safety in Ouagadougou. However, this argument needs to be reinforced by an awareness-raising campaign aimed at better informing citizens of the safety benefits of public transport.

Reliability of the bus network in Ouagadougou: A major challenge for the efficiency of public transport

The reliability of the transport network is another decisive aspect in the adoption of buses by city dwellers. According to the data available, 54% of respondents consider the bus network to be unreliable, while 46% give it a favourable opinion (figure 7).



Source: fieldwork (November 2023)

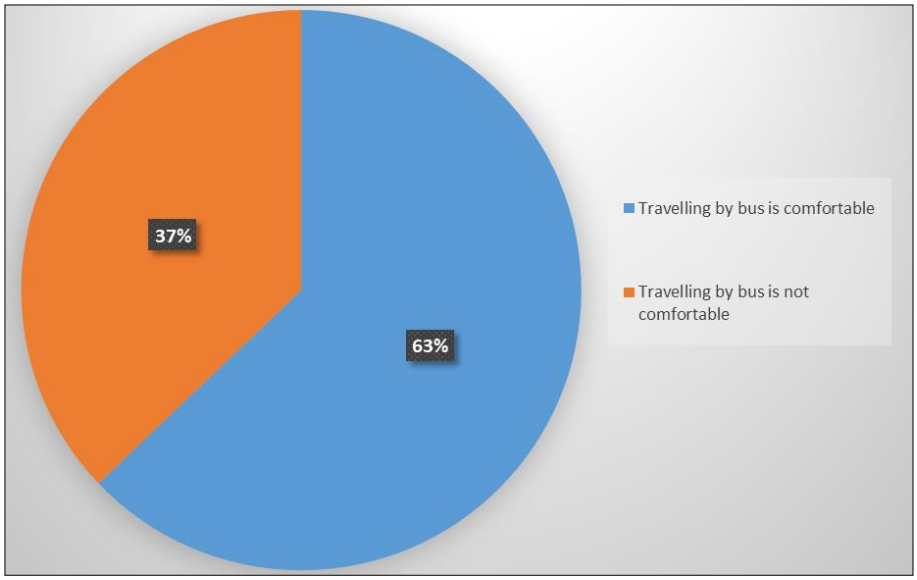
Fig 7: Assessment of the reliability of the bus network in Ouagadougou

This finding reveals a division of opinion that highlights the challenges facing SOTRACO.

Research by Buehler (2010) [3] shows that the reliability of the transport network plays a fundamental role in the adoption of buses, particularly in cities where individual transport dominates. In Ouagadougou, improving bus connectivity, regularity and synchronisation with other modes of transport could significantly increase user satisfaction and loyalty.

Perceived bus comfort: A subjective but essential criterion

Bus comfort is an often subjective criterion, but one that plays a key role in user satisfaction. In Ouagadougou, 63% of respondents felt that buses were comfortable, while 37% felt that the level of comfort was insufficient (Figure 8).

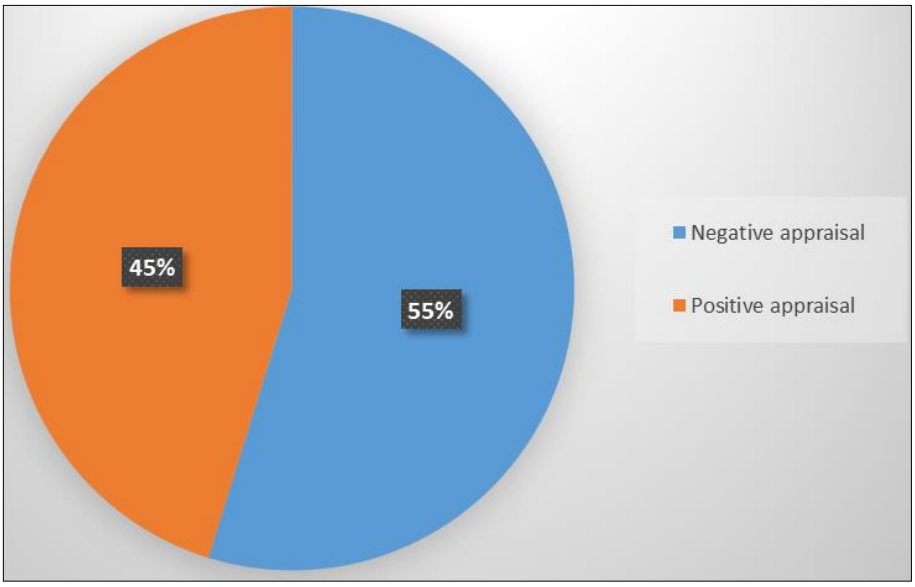


Source: fieldwork (November 2023)

Fig 8: Assessment of the reliability of the bus network in Ouagadougou

This last group (37%) could include users used to individual modes of transport, which are more personalised and perceived as offering greater freedom.
Litman (2020) [9] states that passenger comfort on public transport has a strong influence on user retention. To improve the perception of comfort on SOTRACO buses, improvements such as vehicle modernisation and better air conditioning could be considered. It is also essential to adapt the bus offer to the varied expectations of users in order to build loyalty.

Summary of perceptions of SOTRACO's operations
Overall, the data collected reveals a rather negative assessment of SOTRACO's current operations. Over 55% of users are critical of the service, while 45% have a favourable opinion (figure 9).



Source: field work (November 2023)

Fig 9: Predominantly negative assessment of SOTRACO's current operations

These results highlight the major challenges facing public transport in Ouagadougou, namely improving punctuality, reducing the impact of congestion, and increasing bus reliability and comfort.
The study by Boisjoly and El-Geneidy (2017) [2] highlights the importance of service quality in improving user satisfaction and public transport ridership. In Ouagadougou, a comprehensive improvement plan for the bus network, including investment in infrastructure, better network management and increased awareness of bus use, is essential to encourage its adoption.

Conclusion
Analysis of the perceptions of public transport users in Ouagadougou, and in particular of the SOTRACO service, highlights major challenges to the mass adoption of the bus as an alternative mode of transport to two-wheelers. Shortcomings in terms of punctuality, network reliability and adaptability to road congestion conditions significantly reduce the efficiency and attractiveness of this mode of transport, despite certain assets such as the low recurrence of breakdowns and the relative comfort of buses.
Punctuality is undoubtedly a major obstacle to the development of public transport in Burkina Faso's capital. Punctuality is a fundamental criterion for assessing the efficiency of a transport service. In Ouagadougou, however, the irregularity of schedules encourages residents to turn to means of transport perceived as more flexible and autonomous, such as motorcycles. The absence of bus-only corridors (BRT) exacerbates this situation, as it does not allow the service to escape traffic jams. It is essential that SOTRACO improves the regularity of its service to compete with the speed and agility of two-wheelers in a congested urban environment.
The low number of breakdowns is certainly an advantage for the bus's image, but it is not enough to compensate for the other shortcomings of the service. The experience of cities that have implemented efficient bus systems shows that several parameters need to be aligned: punctuality, frequency, safety and quality of service all influence the decision to opt for the bus.
An analysis of the perceptions of public transport users in Ouagadougou, and in particular of the SOTRACO service, reveals major challenges to the mass adoption of the bus as an alternative mode of transport to two-wheelers. Shortcomings in terms of punctuality, network reliability and adaptability to road congestion considerably reduce the efficiency and attractiveness of this mode of transport, despite certain advantages such as the low frequency of breakdowns and the relative comfort of buses.
Punctuality is undoubtedly a major obstacle to the development of public transport in the capital of Burkina Faso. Punctuality is a fundamental criterion for assessing the effectiveness of a transport service. In Ouagadougou, however, the irregularity of timetables encourages residents to turn to means of transport perceived as more flexible and autonomous, such as motorbikes. The lack of dedicated bus lanes (BRT) exacerbates this situation, as it does not allow the service to avoid traffic jams. It is essential that SOTRACO improves the regularity of its service to compete with the speed and agility of two-wheelers in a congested urban environment.
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frequency, safety and quality of service all influence the decision to opt for the bus.

In short, if buses are to become the preferred mode of transport in Ouagadougou, considerable efforts will have to be made in managing the service and raising public awareness. Priorities include improving punctuality, creating dedicated corridors to counter congestion, and raising awareness of the safety benefits of the bus. A complete overhaul of the network and strategic investment in infrastructure are needed to position the bus as a competitive alternative to two-wheelers.

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