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Research Article

Urban Mobility and Road Safety: Approach to the Safety of Users of Soft Modes of Transport in Grand Lomé

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Abstract

Road insecurity is a major challenge for the international community. The aim of this article is to take stock of the safety of users of soft modes of transport in Grand Lomé. The methodology used in this research is based, on the one hand, on the literature review in order to examine the different theories that govern the analysis of road safety issues and particularly on the safety of vulnerable users of soft modes of transport, and on the other hand, on the analysis of the realities on the ground through surveys and interviews with stakeholders. The results reveal real difficulties in getting around users of active modes of transport on the roads of Grand Lomé. The main roads do not have sidewalks and pedestrian crossings. The sidewalks that exist on some of the new roads are, for the most part, narrow and illegally occupied by businesses, which prevent users of soft modes from benefiting from them. Bike lanes are almost non-existent on the developed lanes. Following this logic, the street belongs first and foremost to motorists. Pedestrians and cyclists are guests who must negotiate their passage on the roads of Grand Lomé.

Keywords

Road Safety, Vulnerable User, Soft Mode, Active Mode, Urban Roads, Grand Lomé, Sidewalk, Cycle Path

1. Introduction

According to a WHO report (2011), 1.3 million people die each year as a result of collisions, more than 3,000 deaths per day, and more than half of them are vulnerable road users: pedestrians, cyclists and motorcyclists [7]. Statistics show that Africa is setting a bad example [11]. According to the WHO report, the death rate from road accidents in this region of the world is the highest. It stands at 26.6 deaths per 100,000 inhabitants. The continent has the highest fatality rate for pedestrians and cyclists, accounting for 44% of total fatalities in this category of road users. Unless effective action is taken without further delay, collisions will become the seventh leading cause of death worldwide by 2030 and will cause some 1.9 million deaths per year" [23].

Unlike the large agglomerations of European countries where urban approaches have long integrated a reflection on road safety, the technical integration of road safety into urban

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planning is little recognized in terms of accident prevention in cities in African countries. The integration of modes and functions makes it possible for all users of the same urban space to cohabit with the dual objective of good safety and a better quality of life [10]. According to [12] cited by [18], the sprawl of cities in Africa, which has been carried out in the concern of poor populations to find housing on the outskirts, "has lengthened the distances to be covered between these peripheral neighborhoods and the central neighborhoods that are home to the majority of formal and informal activities". Commuting movements between the periphery and the city center "increases the exposure of users of soft modes such as pedestrians and cyclists" [18].

In Togo, and particularly in Grand Lomé, urban transport development policies focus on road development that does not take into account vulnerable road users. All efforts made in the development of road infrastructure are made solely for the benefit of motorists. Implementation strategies against automotive hegemony remain insufficient and ineffective [2]. This situation, coupled with the involvement of several public institutions in road safety management, has resulted in "poor coordination and laxity at all levels of commitment" to the safety of vulnerable road users [3]. Pedestrians and cyclists are guests who have to negotiate the roads, which have been developed but do not have sidewalks and pedestrian crossings. However, the sidewalks that exist on some of the new roads are, for the most part, narrow and illegally occupied by businesses, which prevent users of soft modes from benefiting from them. Bike lanes are almost non-existent on all the roads that have been developed. Following this logic, the street belongs first and foremost to motorists. Pedestrians and cyclists are supposed to negotiate their passage on the roads of Grand Lomé. According to [19], "street design is the basis of road safety.. The more space we give to other types of users than vehicular modes (pedestrians, cyclists, public transit users, etc.), the more these users will take ownership of the street: they will be more present and, consequently, the street will be safer for everyone." Thus, the role that is assigned to the street has an impact on the safety of vulnerable road users.

The objective of this research is to take stock of the safety of users of soft modes of transport in Greater Lomé. Users of these modes of transport are the most vulnerable to the risk of road traffic accidents in the sense that they do not have any physical protection to reduce the consequences of accidents.

2. Study Settings

Lomé, the capital town of Togo, is located at the south-western tip of the country, within the Maritime region. It is bordered to the south by 22.4 km of coastline overlooking the Gulf of Guinea in the Atlantic Ocean, to the north by the canton of Dalavé and Kovié, to the east by the major bed of the Zio and the canton of Djagblé and to the west by the border with Ghana. Its strategic position at the intersection of several trade corridors in West Africa gives it a unique commercial dynamism.

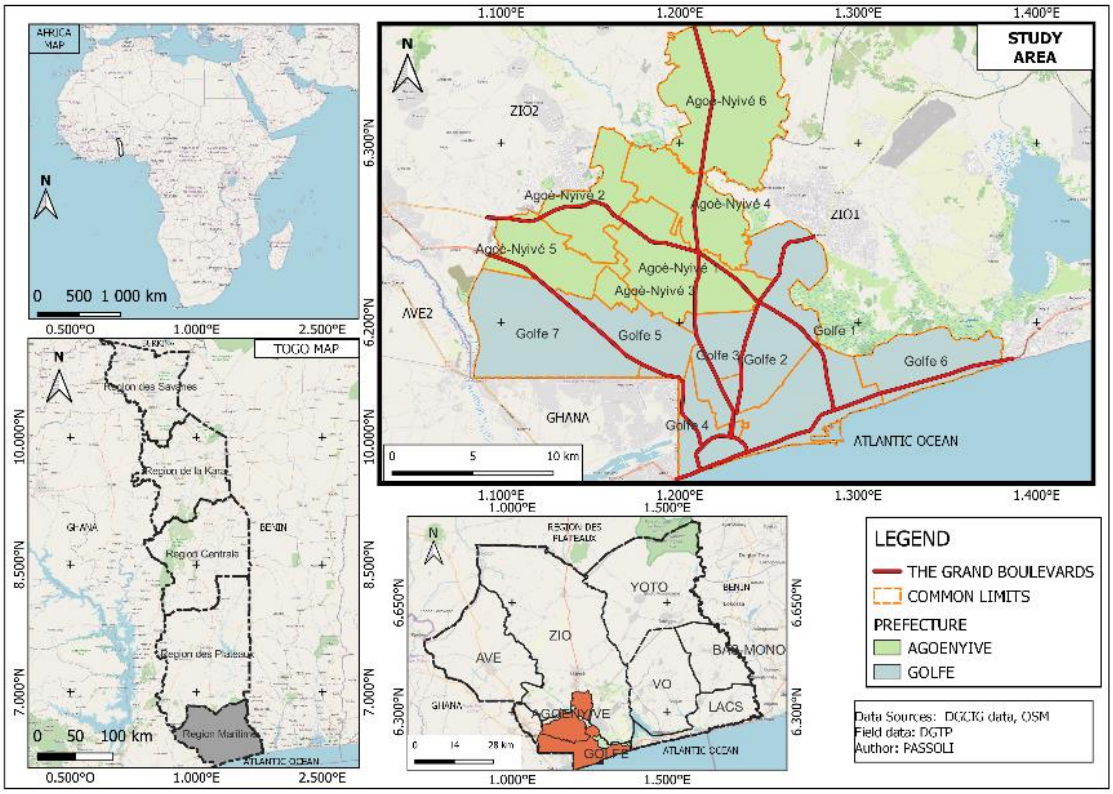


Figure 1. *Location and administrative division of Grand Lomé in the maritime region.*

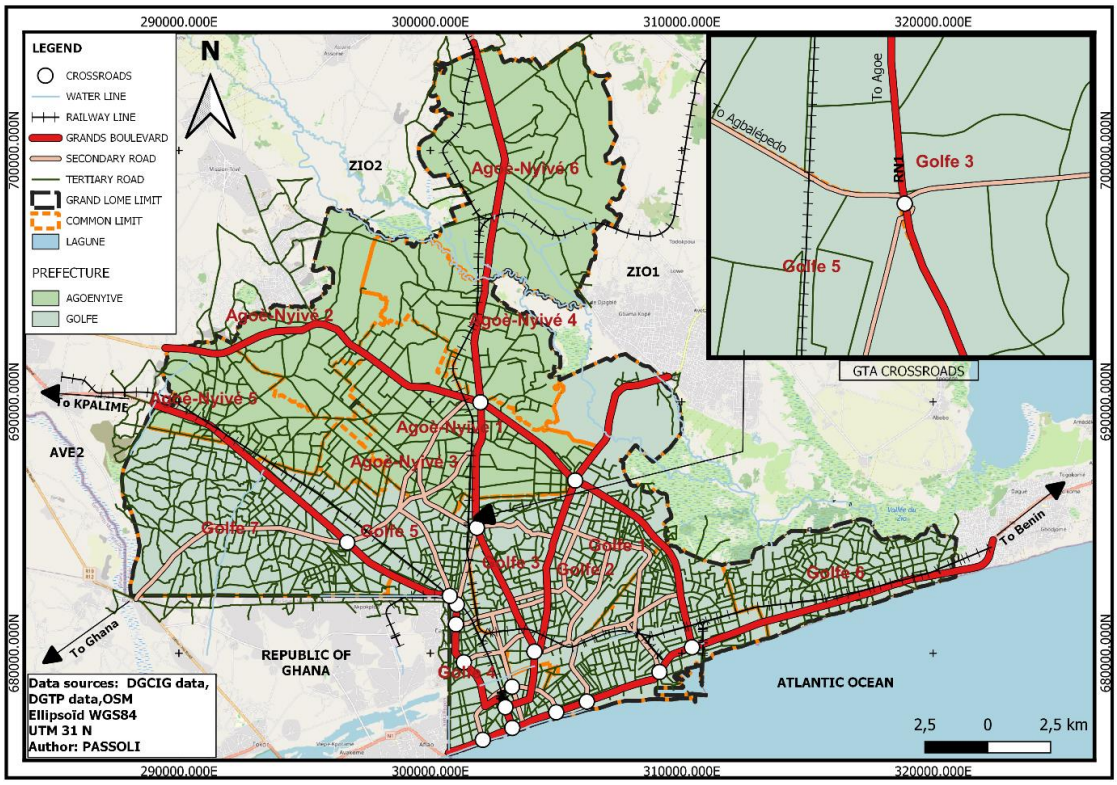
The Autonomous District of Grand Lom é(DAGL) includes 7 communes of the prefecture of Gulf, and 6 communes of the prefecture of Ago è Nyiv é. The administrative division according to these 13 municipalities replaces the historic municipalities Figure 1.

Grand Lom é extends to the southern end of the Agoueve plateau, on the Tokoin and Ago è-Nyiv é plateaus of barren earth. The SDAU notes that there are strong inequalities in terms of equipment between the old central districts and the under-equipped peripheries. Indeed, urban sprawl has not been accompanied by a deconcentration of the main urban functions, which are still mainly located in the historic heart of Lom é. Also, in 2018, the administrative and commercial centre of the southern part of the lagoon still concentrated a large majority of the political, economic and financial functions that generate significant road traffic.

The typology of the routes is very varied and depends on the main use made of them. Thus, according to the diagnostic report on the study on bus, taxi-city and two- and three-wheeler stopping points on the arteries of Grand Lom é, the urban roads of Grand Lom é are characterized by their multifunctionality. The following hierarchy is commonly accepted:

1) Service or tertiary roads, which are roads that give priority to the life of the local area by ensuring the service and life of the neighborhoods. They promote a mix of users: pedestrian and two-wheeler travel is favored, general traffic is moderate, low speed is reduced to 50 km/h, heavy traffic is reduced except in the case of bus lines.
2) Distribution or secondary roads that provide both travel within neighborhoods and links between neighborhoods. The speed limit is 50 km/h. Traffic flows can be significant and the spectrum of traffic can vary greatly.
3) Arterial or primary roads: Providing links between neighborhoods or city crossings, the traffic function is preponderant but not exclusive. In some cases, the traffic spectrum can be similar to that of an intercity road: heavy traffic, marked traffic peaks. On this type of road, the speed limit is 50 or 70 km/h. The three pathways that are the subject of this study fall into this category.
4) Pedestrian areas and pathways: apart from these three recognized categories, we speak, theoretically, of these last pedestrian paths created with the aim of returning to pedestrians certain spaces previously occupied by car traffic. But in reality, pedestrian paths and ways are far from reality and pedestrians are the poor relation of road developments.

In addition, all arterial roads and several secondary roads are asphalted, while most tertiary roads are dirt, except in the city center and in certain neighborhoods Figure 2.



Source: Authors, 2024

Figure 2. *Characteristics of the road network of Grand Lom é*

The road situation is more alarming in the peripheral areas of Greater Lomé than in Lomé, a municipality whose asphalting status is shown in the table below.

Table 1. *Type and condition of roads in Lomé Commune.*

Type	State			Total
	Good (m)	Average (m)	Bad (m)	
Asphalt Roads	124 723	53 233	844	178 800
Paved Roads	4 900	7 300	0	12 200
Earth Roads	3 918	62 696	717 868	784 482
Total	133 541	123 229	718 712	975 482

Source: DGTP and authors, 2024

The road network of Grand Lomé is well developed and meshed. In particular, it provides services to economic polarities of national scope such as the Autonomous Port, the Big Market, Gnassingbé Eyadema International Airport, the Adétikopé Industrial Platform (PIA), etc. to the hinterland and the sub-region. The structure of the main network is radial from the historic center to the major road corridors that serve the neighboring coastal countries (Ghana and Benin, via the RN2) as well as the interior of the country (Cinkassé-Lomé via the RN1, Kpalimé-Lomé via the Boulevard du 30 Août/RN5 and Lomé-Vogan-Anfoin via the RN34). In addition, Lomé has two tangential axes: the circular boulevard that encircles the historic center and the major bypass that connects the autonomous port to the RN1. The primary network is made up of the roads connected to the circular boulevard that direct all travel flows towards the interior of the city.

3. Methodology and Materials

The methodology used in this research is based, on the one hand, on the literature review in order to examine the different theories that govern the analysis of road safety issues and particularly on the safety of vulnerable road users, and on the other hand, on the analysis of the realities on the ground through surveys and interviews with stakeholders. Indeed, theses, dissertations, journals and articles, general and specific works of transport authorities, transport operators and transport trade unions are consulted on site. Other documents are directly exploited on the Internet.

The target population is made up of pedestrians, cyclists, local residents, motorized drivers (motorcycle and car drivers) and promoters of economic activities along the main roads of Grand Lomé. In view of the absence of official statistics on the actual size of this category of the population in Lomé and the inability to enumerate them in the field, we carried out accidental non-probability sampling. According to this type of sampling, the selection of the elements composing a subset is made on the basis of their presence at a given place(x) and at a given time (t). It is therefore the type of sampling that is best suited to our study where there is no sampling frame. We selected a random sample of 119 people, including 47 pedestrians, 39 cyclists, 33 motorcycle drivers, 24 vehicle drivers, 14 local residents and 59 economic operators. The interviews consisted of asking a series of pointed and objective questions to the leaders of the various socio-collective structures installed along the main roads of Greater Lomé. These interviews provided some key and precise information to complement the results of the questionnaire survey. The counting of flows on the main roads is carried out over 2 days, i.e. from 8 to 9 January 2024, during the morning rush hour from 6 a.m. to 8 a.m. in both directions. This count made it possible to know the modal share of road traffic and to get an idea of the extent of traffic jams on the roads of Lomé.

The analysis of the information collected in the field was done on the computer using Sphinx and Excel software. They have made it possible to draw up graphs and statistical tables with a view to analyzing and interpreting the various phenomena. To make places and networks easier to read, maps are made using the Arc GIS mapping software.

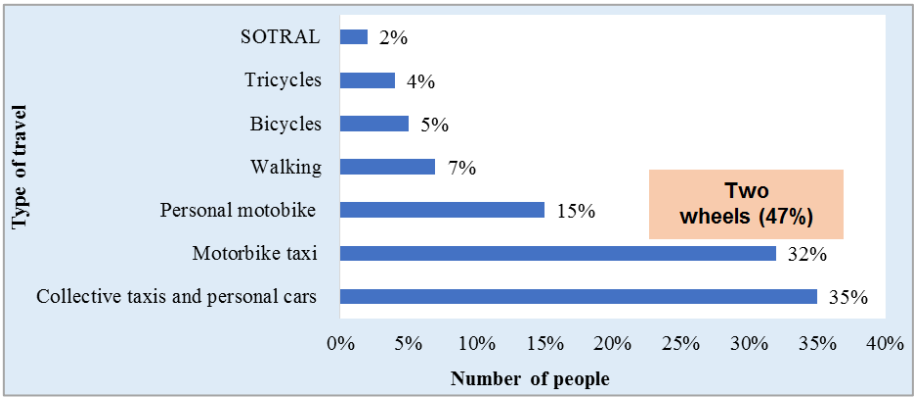
4. Results and Discussions

4.1. Results

4.1.1. Motorised Two-Wheelers, a Dominant Mode of Transport on the Roads of Grand Lomé

Traffic on the main roads (Bd Gnassingbé, Bd 13 janvier, Bd 30 August, Bd Jean Paul II and Bd du Mono) is dominated by two-wheelers, which account for 47% of road traffic. This is followed by shared taxis and private cars with 35% of the means of travel. Active modes of transport, in particular walking and cycling, only come in third place with 7% and 5% of trips respectively. Finally, the number of tricycles and buses is the smallest, accounting for 4% and 2% respectively of all means of travel counted during the morning rush hour.

However, the number of pedestrians should be put into perspective because it was very difficult to count them due to the lack of appropriate technical means. As a result, they do not have fixed itineraries and their motives vary greatly.



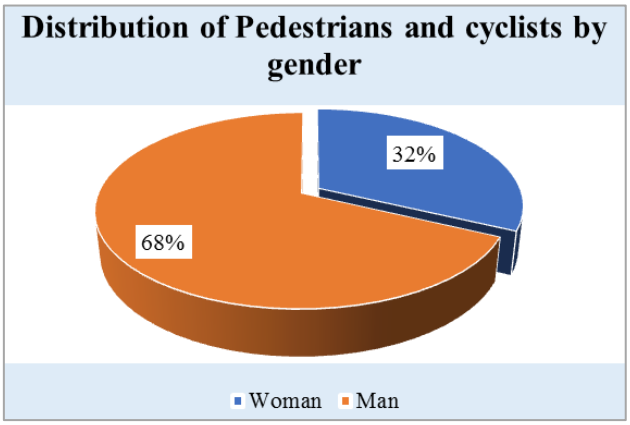
Source: Authors' Flow Count Results, 2024

Figure 3. *Modal share on the main routes of Grand Lomé (%).*

Traffic on the tracks of Grand Lomé is very dense. Indeed, they are central axes of the city of Lomé that drain all flows from the northern peripheries to the city center. This traffic density is due to the increasing motorization of the population, most of whom live very far from the city center.

4.1.2. Profiles of Users of Active Modes of Transport on the Main Roads of Grand Lomé

The results of the field survey of 86 users of active modes reveal more men than women (Figure 4).



Source: Field survey, authors, 2024

Figure 4. *Distribution of Pedestrians and Cyclists Surveyed by Gender.*

According to the results of our survey, nearly 3/4 of users of soft modes of transport are men (68%). This is due to the fact that many women do not like to go by bike and even then few accept walking long distances. They are more often seen walking very short distances for local domestic activities. For longer distances, they often prefer to use motorcycle taxis. Nevertheless, there are women street vendors who travel long distances in search of customers to sell their goods. Within this group, there are more young people than older people.

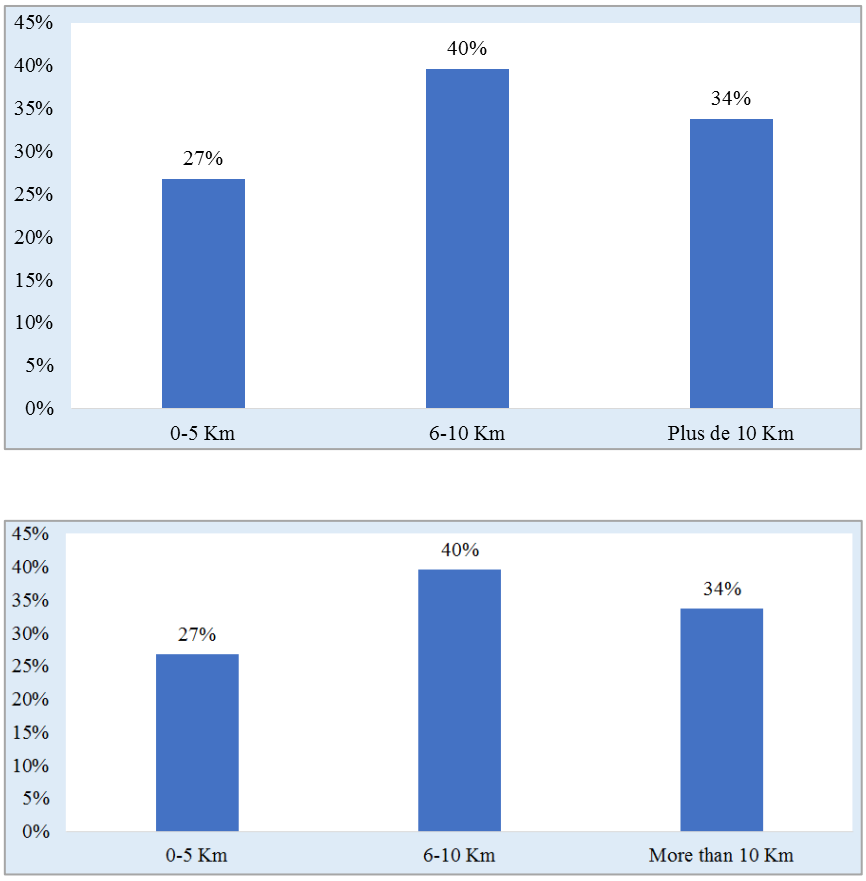
Table 2. *Distribution of users of soft modes of transport by age.*

Age range	[0-18]	[18-25]	[25-40]	40 ans et plus	Total
Percentage (%)	6,7	46,67	26,67	20	100

Source: Field survey, authors, 2024

The analysis of the table above shows that the age group between 18 and 25 years is more numerous. This layer represents students and apprentices who are using more soft modes for their travels. It's a low-income stratum, so only walking or cycling allows them to get around at a lower cost. It is followed by those between the ages of 25 and 40. This is the interval in which we find many housewives, craftsmen and shopkeepers walking around with their goods. The 40 and over age group represents retirees and some seniors who make local trips to meet their socio-economic needs.

Many of the soft mode users surveyed travel long distances (Figure 5).



Source: Field survey, authors, 2024

Figure 5. *Distribution of users of soft modes of transport according to the distances travelled.*

The majority of respondents travel a distance of between 6 and 10 km, i.e. 40% of the users surveyed. Those who travel more than 10 km (34%) mostly use the bicycle and others, however, take the motorcycle for a given distance, covering their financial means and continue by walking the rest of the route. Finally, those fewer than 5 km, who account for 27%, are mainly pedestrians.

4.1.3. Malfunctions That Hinder the Movement of Users of Soft Modes of Transport on the Roads of Grand Lom é

(i). Lack of Lane Development Dedicated to Users of Soft Modes

Several sections of roads in Grand Lom é such as the section "GTA - Golf Club Ago è– nyiv é and Colombe de la paix – D ékon on Boulevard Gnassingb é Eyadema" do not have sidewalks or cycle paths. These are lanes that have been designed solely to facilitate the mobility of users of motorized modes. Other sections of track do have very wide rights-of-way, but they are unused and remain mostly occupied by shops and other craft activities of all kinds. In some places, these rights-of-way are overgrown with grasses and runoff during the rainy seasons. Also, we note the construction of gas stations at certain levels where these rights-of-way are completely taken over. Faced with this situation, pedestrians and cyclists are forced to walk or ride on the side of the road; this leads to conflicts of use between motorized and soft modes on the one hand, and between occupants of rights-of-way for commercial purposes and users of active modes of transportation on the other (Figure 6).

Source: Authors, 2024

Figure 6. *Pedestrians and cyclists on the GTA-Golf Club Agoè-nyivésection.*

In addition to these development shortcomings, it can be seen that almost all of the main roads in Grand Lomécross densely populated areas with strong socio-economic activities. It would therefore be necessary to build pedestrian crossings and speed bumps on these sections in order to help pedestrians and cyclists in their mobility. Unfortunately, there are no pedestrian crossings and speed bumps on these stretches to help pedestrians and cyclists with their mobility. Indeed, no pedestrian crossing has been built, for example, on Boulevard Gnassingbé Eyadéma except those at the GTA and Golf Club crossroads in Agoè-nyivé. Similarly, speed bumps were not built. A single speed bump has been built in front of the General Staff of the Togolese Armed Forces to slow down road traffic and facilitate the exit of civil servants from this structure, most of whom have motorized vehicles. However, the real needs lie elsewhere, insofar as the large areas that generate users of active modes of transport, such as schools, hospitals, churches and stadiums, are devoid of these facilities. All this contrasts with the arguments put forward by some municipal authorities who refuse to build speed bumps on the pretext that it is an international road. Despite all the efforts and steps taken by those in charge of educational and religious structures with the communities to ask for the construction of speed bumps and pedestrian crossings; their grievances went unanswered. Funny, the authority refuses to build speed bumps on the stretch but doesn't offer anything in return to help users.

(ii). Illegal Occupation of Roads by Traders and Parking Lots

One of the major problems encountered by users of soft modes of transport on the roads of Grand Lomé is the occupation of the right-of-way and the edge of the road by informal trade. "The main cause seems to be related to the difficulties of controlling urban dynamics and managing urban space in particular", [8]. Road occupation is a real scourge in Africa. The immediate vicinity of the roads is taken over by shopkeepers who see opportunities to attract customer passengers. Before 2015, in order to set up on the side of a road, you would have to obtain a permit from the municipality. But now, there is no longer any constraint, which means that the phenomenon of occupying the sidewalks is accentuated. It covers all walks of life: young graduates in search of well-being, the rich, the poor and teenagers, and adults who sell a variety of products.

"A variety of products and merchandise, usually displayed pell-mell, on shelves or on the floor, make up the décor. A quick look reveals that the sidewalks are mostly occupied by shops and small boutiques displaying imported products. These products include household appliances and household equipment. These are mainly radios, cassette radios, television sets, especially during the period of major international football competitions such as the Africa Cup of Nations (CAN) or the World Cup, as well as building materials and household equipment", [8]. Actually, it is very risky to occupy the immediate vicinity of the road because a car can derail and cause enormous damage to both property and human beings as there is no protective barrier between the road and the shoulders of the road. Pedestrians often find themselves trapped between motorized modes and these informal commercial facilities as shown in the figure below.

Source: Authors, 2024

Figure 7. *Installation of informal shops on the stretch.*

Apart from the shopkeepers, there are several informal stations for embarking and disembarking passengers along the main roads of Grand Lomé. In addition to these stations, the most alarming thing is the presence of illegal parking on the edges of the roads. These illegal car parks and stations force users of active modes of transport to use certain parts of the road where they are exposed to the risk of accidents, as shown in the figure below.

Source: Authors, 2024

Figure 8. *Anarchic stations and car parks along the tracks.*

(iii). Human Behaviour on the Road Contrary to the Provisions of the Highway Code

Failure to comply with the Highway Code is a scourge that is very prevalent in the city of Lomé. On the road, users of active modes of travel are subjected to several tests. In fact, many drivers of motorized vehicles do not have their driver's licenses. It should be noted that in Togo, although a driver's license is mandatory for all drivers of motorized vehicles, those of motorcycles are not controlled like those of cars. As a result, drivers of motorized vehicles, especially those of motorcycles, do not master the rules of the road.

Other deplorable facts can be observed at the level of the drivers of motorized vehicles. When they see a pedestrian crossing the lane even in the middle of the road, instead of slowing down and giving way, the pedestrians instead accelerate, pedestrians are forced to run to quickly cross the road to avoid being picked up by cars or motorcycles. In addition, in the event of a breakdown of the traffic lights, instead of respecting the right of way to make the traffic flow, every driver of motorized vehicles wants to pass quickly, which causes accidents and makes it difficult for pedestrians to cross the road.

Apart from the constraints related to other road users, certain behaviors inherent to users of soft modes of transport are at the origin of their insecurity. Some of these behaviors include: using the phone and radio headphones on the road, not respecting the rules of the road. Indeed, users of soft modes of transport adopt certain behaviors that are detrimental to their

safety. Indeed, the use of smartphones and its associated applications makes its user glued to the device everywhere, which exposes him to all dangers, especially if he is on the road. The use of smartphones when travelling means that pedestrians and cyclists are no longer vigilant on the road and are sometimes the source of accidents. To add insult to injury, a pedestrian or cyclist uses a radio headset to get around. The latter decreases his hearing ability and has difficulty hearing the horns of motorized vehicles in the event of non-compliance with the Highway Code; This results in traffic accidents.

The high illiteracy rate in underdeveloped countries means that the population, especially the poor, is unaware of the rules of the road. Many users are unaware of the role and importance of pedestrian crossings. They cross the roads almost everywhere without trying to do so at the pedestrian crossings. This situation is a source of accidents for pedestrians because instead of slowing down when they see a pedestrian crossing the road from the zebra crossings, they persist by accelerating.

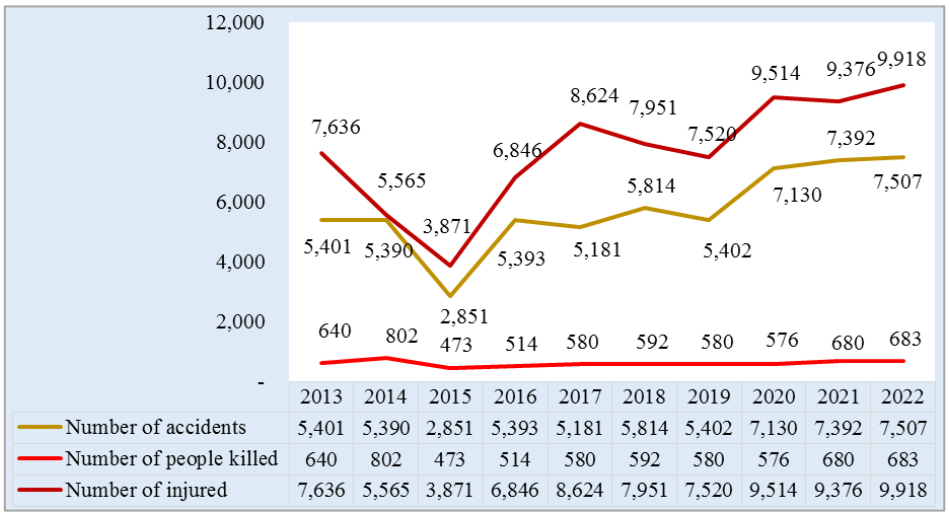
4.1.4. Unfortunate Consequences Linked to the Poor Configuration of the Tracks and the Behaviour of Road Users in Grand Lomé

The obstacles encountered by users of soft modes are a source of several consequences, including traffic accidents, increased time to cross the road, increasing motorization, disconnection of the population and pollution of the environment.

(i). Major Traffic Accidents Involving Pedestrians and Cyclists

The absence of sidewalks, speed bumps and cycle paths exposes users of active modes to traffic accidents on the roads of Grand Lomé. Since several socio-collective infrastructures are located there, many people walk or cycle, but unfortunately motorized vehicles do not give space to the latter; they are rather "chased" off the road. "The occupation of the sidewalk forces pedestrians to encroach on the roadway traditionally reserved for motorists. In a city where motorcycle transport has particularly developed, the road is therefore very congested, leading to many traffic accidents. Traffic during rush hour has become very dangerous and the safety of users is less and less assured", [8].

Finally, a lot of conflicts of use arise on the stretch and it is pedestrians and cyclists who suffer. Thus, the number of accidents involving pedestrians continues to increase every year as shown in the following figure 9.



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Number of accidents	5,401	5,390	2,851	5,393	5,181	5,814	5,402	7,130	7,392	7,507
Number of people killed	640	802	473	514	580	592	580	576	680	683
Number of injured	7,636	5,565	3,871	6,846	8,624	7,951	7,520	9,514	9,376	9,918

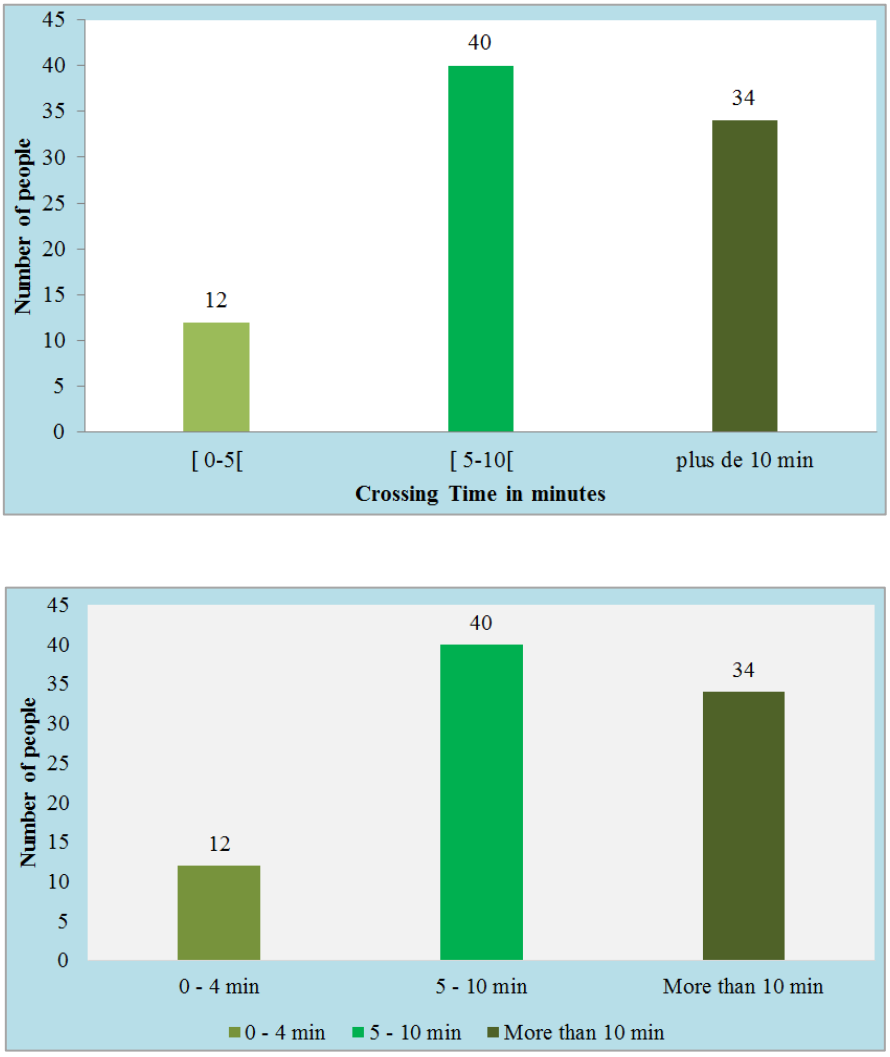
Source: DTRF, 2023

Figure 9. *Evolution of traffic accidents involving pedestrians/cyclists from 2013 to 2022 on the axes of Grand Lomé*

The number of accidents involving users of soft modes of transport such as pedestrians and cyclists has increased from 2013 to 2022, with more than 600 users, or 8%, unfortunately losing their lives on the main roads of Grand Lomé (Bd Gnassingbé, Bd 13 January, Bd 30 August, Bd Jean Paul II and Bd du Mono). The number of victims has been highest since 2016, with an average of 550 deaths per year. Most of the victims are vulnerable people (children and the elderly) who have difficulty crossing the roadway. Unfortunately, drivers of motorized vehicles unfortunately pick them up.

There are several types of vehicles that are involved in accidents impacting users of soft modes of transport. Motorcycles and especially tricycles are the most involved. The latter, having no notion of the Highway Code, circulate without respecting the rules of the road. They are the cause of accidents with several minor or serious injuries and sometimes fatalities. These accidents often become more fatal when they involve users of soft modes of transport and cars or trucks.

Most users of soft modes of transport feel that they suffer before crossing the road on the roads of Grand Lomé, especially during rush hour. More than 86% of users of soft modes of transport take more than five minutes or even more than ten minutes to cross the road (Figure 10).



Source: Authors, 2024

Figure 10. *Pavement Crossing Time on Tracks.*

Crossing the road is a headache for users of these active modes of travel. The absence of speed bumps on several lanes is an opportunity for motorized vehicles to drive at high speed. However, at some intersections fed by traffic lights, these vulnerable users have the possibility of crossing easily by paying attention to these motorized vehicles because the non-observance and non-compliance of the highway code by drivers who constantly violate the lights, make the task complicated, especially for pedestrians. You have to spend dozens of minutes begging for passage before you can cross. The most deplorable fact is that you also have to run across the road or you risk being picked up by a motorcycle or a car. If you don't run, instead of slowing down, these taxi drivers speed up and if you pay less attention, you get insults.

The lack of crossing lanes leads to a disconnection between residents on both sides of the roads. This disconnect can be seen socially and economically.

On the economic front, there is a slowdown in economic activities. Indeed, people do not like to take the risk of crossing the roadway to buy a property on the other shoulder of the road. Often for local purchases, it is the children who do it, parents prefer to buy it not far from home even if this product is not of good quality. Socially, parents no longer like to enroll their children in schools that they would have to cross before going there. The latter do not have the time to accompany them, so they choose local schools in order to reduce the risk of traffic accidents. This has an impact on the number of pupils in schools and the socio-collective centers set up on either side of this section. For example, the Catholic primary school and the Presbyterian Church have several of

their classes closed due to lack of enrolment, whereas in the past they were schools in which there were good numbers.

(ii). Increasing Motorization Leading to Congestion on the Tracks

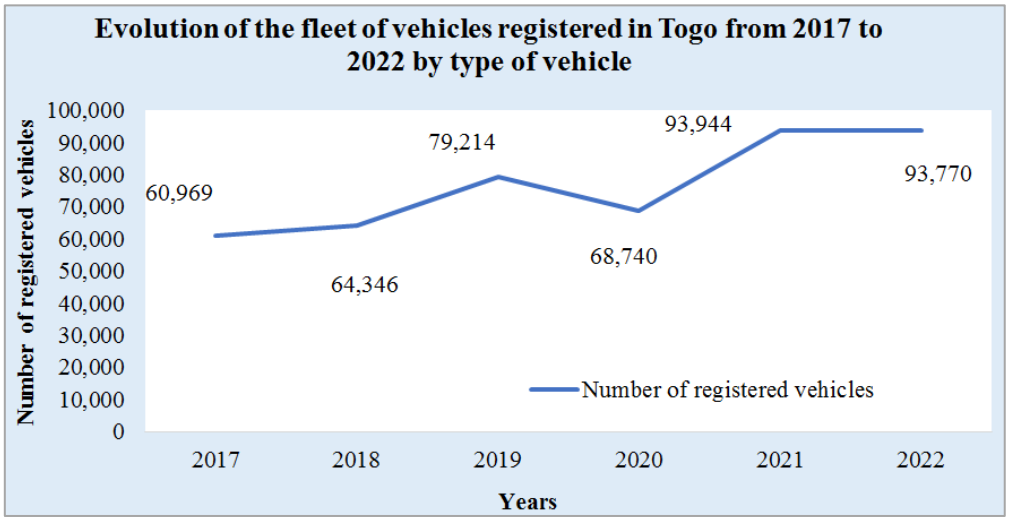
The growing insecurity towards pedestrians and cyclists linked to the lack of facilities in their favor on the roads in Lomé leads users to obtain motorized vehicles. For them, given that the construction of roads in our countries is done for the benefit of motorized vehicles, only the acquisition of a car or a motorcycle could guarantee them safety in their daily travels.

As a result, there has been an increase in the number of cars and motorcycles in Togo in recent years, with motorcycles and tricycles leading the way. Everyone wants to have a way to get around. Currently in Lomé, all citizens who earn a little more than the minimum wage are looking to buy a motorbike. Those on average incomes are looking to buy a car. Since the use of bicycles and walking is considered peasantry and a sign of poverty, many do not want to be treated in this way. They are fighting against all odds to buy a machine. Applications for registration continue to explode at the level of the DTRF, which is responsible for the registration of motorcycles and cars. Table and figure 11 give us more details.

Table 3. *Evolution of the fleet of vehicles registered in Togo from 2017 to 2022 by type of vehicle.*

Category	Number of vehicles					
	2017	2018	2019	2020	2021	2022
Bus/Bus	73	83	133	91	101	145
Trucks	883	897	960	1 407	1 380	1 241
Van	3 149	3 224	3 682	4 085	4 941	4 626
Semi-trailer	569	631	638	816	764	793
Tractor	780	841	856	1 105	1 082	1 195
Car	14 328	15 607	18 072	16 386	20 313	18 131
2 Wheels	39 986	41 798	52 915	42 230	61 277	62 736
3 Wheels	1 201	1 265	1 958	2 620	4 086	4 903
Total	60 969	64 346	79 214	68 740	93 944	93 770

Source: Road and Rail Transport Department (DTRF) database, 2023.



Source: Road and Rail Transport Department (DTRF) Database, 2023

Figure 11. *Evolution of the fleet of vehicles registered in Togo from 2017 to 2022 by type of vehicle.*

The graph above shows the evolution of registrations of Togo's motorized fleet over 10 years. It should be noted that more than 3/4 of these machines are registered in Lomé. Registrations increased exponentially from 2017 to 2022, with the peak in 2021. Although there has been a slight decrease in registrations over the past two years, the trend is still very high for our country; because, already, the existing road infrastructure is not able to support the current traffic flow. We need to quickly implement a major public transit policy throughout the country, especially in urban areas, to curb this race for individual transportation. Otherwise, in the coming years, the authorities will be confronted with serious mobility problems in Togo's cities. The increase in the number of vehicles or motorized vehicles is a source of air pollution. Indeed, these thousands of vehicles emit carbon dioxide during their circulation due to the poor quality of the fuels used, a gas whose polluting nature is very important. The carbon dioxide released is very dangerous not only to human health, but also to environmental degradation. Apart from air pollution, we can mention soil pollution. This pollution is caused by the use of motor oils and other oils used in the maintenance of motorized machinery, the residues of which are dumped everywhere without proper treatment.

The analysis of all its constraints tells us that it is necessary to take measures through the construction of an adequate infrastructure to protect and secure users of soft modes of transport not only on our study section but on the main arteries of the capital of the city of Lomé.

4.2. Discussions

The issue of securing the safety of users of soft modes of transport has been the subject of several studies carried out by public authorities, architects, engineers, planners, geographers and urban planners at both international and national levels. They are unanimous in recognizing that walking and cycling are the most common means of transportation used by people in developing countries. Unfortunately, we notice the almost non-existence of this infrastructure on most of our roads.

In his analysis of the anarchic occupation of roads, [8] points out that the illegal occupation of sidewalks in large cities by certain categories of the population is not a new phenomenon, but has been particularly active for more than two decades and is beginning to take on worrying proportions in terms of its consequences for urban dwellers. [5] identified the factors of unbridled urbanization and determined the causes of traffic accidents in Lomé. In his analysis, he points out that population growth coupled with the spatial expansion of the city of Lomé is a source of increasing motorization, thus causing an increase in accidents. In addition, he points out that one of the shortcomings of most streets in Lomé is that they do not have cycle lanes or sidewalks; Even if they do exist, they are in most cases occupied by businesses." In analysing the evolution of the city, [15] reveals that "the observation that must be made in the analysis of the evolution of the capital is that the roads do not keep up with the growth of the city at all". He goes on to say that "the road network, which supports urban transport, is represented by a few asphalt or paved streets and a high proportion of dirt streets". Seeking to characterize the Togolese road network, he states that "this network is very inadequate with narrow arteries sometimes devoid of sidewalks, and roadways in places."

Buaka Anoumou [25] discusses the consequences of these dysfunctions on the mobility of the population, revealing that traffic difficulties are more serious during the wet period due to the permanent stagnation of rainwater on the roads in the city center and peripheral districts. In the same vein, [24] shows that on all asphalt streets such as Lassa Street in Lomé, rainwater often flows from the road to the sidewalks. According to the results of a study carried out by the [16], "non-motorized transport, especially walking, occupies a dominant place in the majority of African cities. Between 50 and 90% of journeys are made on foot." In the same vein, [14] shows that walking is not only the local mode of travel but also the long-distance mode of travel in Kara as in several secondary cities in Africa, contrary to the situation of students in developed countries. According to this study, students in the Kara region are mainly walkers: 96% of primary school students, 85% of secondary school students and 44% of students. [9] mentions the same observation after a similar study in the city of Ouagadougou. The study reveals a considerable contribution of this mode in Ouagadougou for schoolchildren and the poor, whose conditions appear to be better. For [2], it appears particularly difficult, especially for pedestrian students, to solicit the road from motorists for the crossing. He continued his analysis by expressing the hope that the whole issue of analysis of the security system would focus mainly on this fringe of schoolchildren who are the most vulnerable in terms of mobility in Lomé. In drawing the conclusion of his study, the author proposes a development on the roadway to protect students in a project called "safe return to school". The articles by [13, 20-22] all mention the importance of the use of active modes in the movement of students in African cities. For [1], the general observation on urban mobility shows that bicycles are used less in Lomé for reasons of insecurity, lack of facilities and difficulty in cohabiting with motorized vehicles, which are more numerous on the roads. However, cycling is the main means of transportation for some city dwellers that must be taken into account [17].

To address all these shortcomings in the development of the road network, [3, 4] recommend the development of subsidiary structures. According to the authors, when building roads, public authorities must provide for the design of gutters, cycle paths, pedestrian paths or sidewalks around sections and footbridges. They continue their analysis by deeming it necessary to install speed bumps or speed limit signs, improve lighting and traffic lights, traffic signs and the rigorous pres-

ence of law enforcement at each intersection in order to reduce speeding and accidents. Speaking of the promotion of soft modes of transport in cities in developing countries, [6] points out that "reflections on road sharing, particularly with the aim of developing the use of active modes of transport such as walking and cycling, could make it possible to find solutions adapted to less developed countries where pedestrians and cyclists do not benefit from the same travel conditions".

5. Conclusion

At the end of this article, which aims to analyze the safety of users of soft modes of transport in Grand Lomé, several lessons are learned. The study identified certain constraints that have a negative impact on the mobility of users of active modes. They can be summed up in the absence of crossings on the main roads of Grand Lomé, the disrespectful practices of drivers of motorized modes of transport and finally the bad behavior of users of soft modes of transport. All these difficulties are at the origin of several problems such as traffic accidents, the increase in the time it takes to cross the road, an increasing number of motorizations, the disconnection of the population and the pollution of the environment. In view of the harmful consequences linked to the shortcomings in terms of road layout and the behavior of road users, measures must be put in place to facilitate the movement of users of the soft modes of transport so sought after by the international community. The proposals made are based on the comments made during the fieldwork. It will therefore be interesting, according to our interviews with the actors and the remarks made during the fieldwork, to think about a clear separation of flows given the insecurity on users of soft modes of transport and its consequences. The construction of bike lanes and sidewalks to provide the space that is so much sought after by users of active modes of transportation. The physical separation between the roadway and the cycle path will prevent drivers of motorized modes from invading these structures dedicated to users of soft modes of transport at all times. In addition, footbridges can be built to solve the problem of pedestrians crossing the road without wasting too much time and without risking the loss of their lives. It should be noted that with the footbridges, parents, police officers and teachers will no longer need to assist children every day in crossing the road and this is a time saver for everyone. Also, a redevelopment of intersections would be possible to allow users of soft modes of transport to easily cross these risk areas without fear. In addition to these crucial recommendations, it is necessary to raise awareness among all stakeholders in order to enable them to become truly aware of the need for each user to respect the Highway Code and the importance of implementing proactive and inclusive sustainable transport policies in our countries that take into account the needs of all users. Authorities, whether national or decentralized, must not resign themselves to the eternal refrain of a lack of resources in order to refuse to offer citizens better mobility conditions.

The implementation of all these recommendations would only be possible and effective with a real will on the part of all the actors involved, such as public authorities, local authorities, civil society and users. The commitment of the public authorities would make it possible to better coordinate all actions and would situate the responsibilities of each party according to the standards and regulations defined. In addition, it seems essential to facilitate the conditions for the implementation of road safety actions through the allocation of substantial human and financial resources. It should be noted that road safety is not a reality that is only external to man, which can be conquered with arms or imposed by force. Above all, it is an awareness of all road users about the importance and the fragility of their lives. Life is sacred, so no life should be sacrificed on a road; therefore, it is an individual and collective duty to take care of it on a daily basis.

Abbreviations

WHO: World Health Organization
SSATP: Southern Africa Transport Policy Programme
UN: United Nations
DAGL: Grand Lomé Autonomous District
SDAU: Master Plan for Urban Development and Planning
RN2: National Road No. 2
PIA: Adétikopé Industrial Platform
RN1: National Road No. 1
RN34: National Road No. 34
Bd: Boulevard
GTA: Togolese Insurance Group
DTRF: Road and Rail Transport Department
DGTP: Public Works Department

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Conflicts of Interest

The authors declare no conflicts of interest.

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