

# **Exploratory Study of Road Safety in the Urban Area of Casablanca-Rabat-Salé-Kenitra**

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## **Abstract**

*In Morocco, the assessment of road risks costs more than 3,500 deaths and 12,000 injuries per year, with an average of 10 killed per day and a loss of 1.7% of the Gross Domestic Product. Indeed Moroccan roads are among the deadliest in the world, a vehicle kills 18.2 times more than in Sweden and 13.5 times more than in France.*

*The Casablanca-Rabat-Salé-Kenitra urban area represents a pilot regional axis that houses the capital of Morocco. This urban area is distinguished by enormous potential and differentiated territorial dynamics. Nevertheless, this CRSK urban area still experiences huge gaps, it generally remains an area of road insecurity. The aim of this article is to make an inventory of the road risks in the Casablanca-Rabat-Salé-Kénitra urban area and to propose a practical road safety method adapted to the specificities of the CRSK urban area. The choice of this method was based on the data that were identified from the survey of key territorial actors and citizens of the CRSK urban area, the strategic diagnosis CRSK urban area and the benchmarking study the methods/practices of the pilot regions in terms of the road safety.*

**Keywords:** *Road Risk, Casablanca-Rabat-Salé-Kénitra Urban Area, Road Safety*

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Date of Submission: 28-12-2022

Date of Acceptance: 08-01-2023

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## **I. Introduction**

In the Casablanca-Rabat-Salé-Kenitra urban area, the car fleet is constantly expanding and motorized travel during all hours of the day is intensifying, which generates multiple dysfunctions in terms of mobility, connectivity and urban fluidity. . Such a situation increases the risk of accidents in this urban area whose arteries are increasingly saturated. Risk is a probability between zero and one of seeing an event occur that is considered unfavorable. And every day brings its share of bad news of the carnage that rages on these roads.

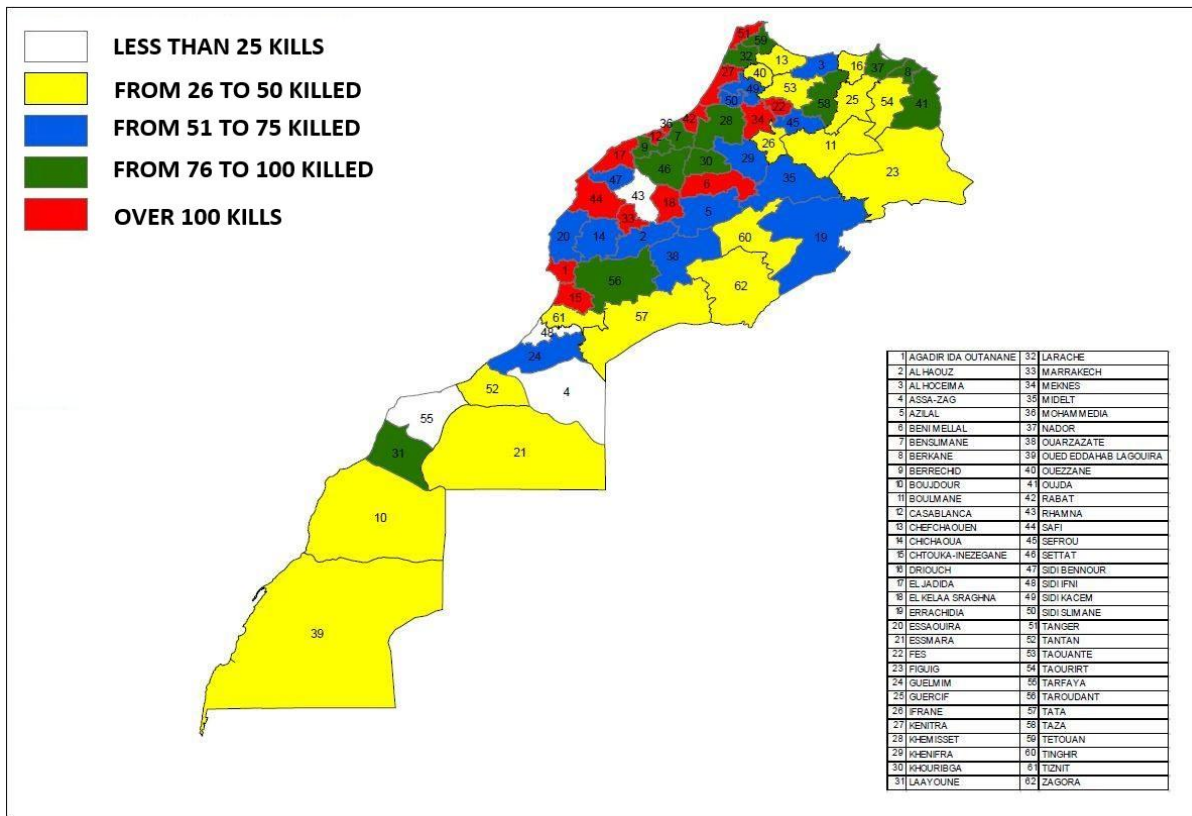
The average is ten deaths a day, and hundreds of injuries, not to mention broken families, young people disabled for life, children delivered to misery and billions of dirhams lost to our economy. The finding is bitter. There is a hidden delinquency, which does not say its name, but which causes many victims. It is a crime to which we are all exposed every time we hit the road. It would seem for many of our fellow citizens that road accidents are a fatality that must be accepted with resignation. Faced with this problem, the system to fight against this scourge is multidimensional this urban area records the highest number of road traffic accidents, which increases the risks that threaten the safety of users on public roads.

The objective of this territorial assessment is to contribute to improving road safety and whose sustainable mobility is a lever for development and a tool for rapprochement, economic performance and social progress, beneficial to the whole community and at the lowest human cost.

### **I. Road risk analysis in the Casablanca-Rabat-Salé-Kenitra urban area**

In the last two decades, Morocco has experienced a strong socio-economic dynamic which has resulted in the multiplication of trade and the growth of road traffic.

Figure 1: Geographical distribution of the average number of road accident fatalities in Morocco



The number of vehicles in circulation increases annually on average by 5%. The lion's share in this park goes to passenger cars which represent nearly 70% of the total. Knowing that 50% of these vehicles are accounted for in the regions of Casablanca, Rabat and Kenitra alone. The car fleet continues to expand and motorized travel during all hours of the day is intensifying.

The control, organization and management of this mobility represent considerable security challenges. Of which, the number of traffic accidents has also increased sharply, which threatens territorial sovereignty. In this context, territory is the support of sovereignty. It is often taken in the sense of a space based on the membership of human groups in a space that is both social and cultural, a domain of life and development, a zone of political influence or development and security.

Socially produced risks contribute to shaping territories because they weigh on territorial practices, on symbols or even stigmas attached to places and the populations that occupy them. In this sense, risks and territories, like two processes of social construction, are both mutual causes and products. The accident reports reveal the importance of the number of victims who succumb following road accidents "According to statistics provided by the guardianship, nearly 4,000 people die on the roads, a quarter of which are pedestrians who are the most vulnerable users. an average of 11 deaths per day. Worse still, 217 killed are children under the age of 14. With regard to motorized 2-wheelers and 3-wheelers, the number of victims is constantly increasing, representing almost a quarter of those killed. (...). Also, 16% of accidents involve a single vehicle, 70% of which concern light cars. Professional transport is not left out. Accidents caused by these transporters are generally serious, accounting for nearly 10% of fatalities. Furthermore, the leading causes of accidents outside built-up areas are speeding (50%) and failure to take precautions (25%). Inside the urban perimeter, the opposite occurs, 40% of accidents are the direct consequence of the lack of precautions and 33% by speeding".

#### a- Analysis of road safety in Morocco

Studies by the National Committee for the Prevention of Traffic Accidents (NCPTA) show that 93% of accidents recorded during the period 2011 to 2022 took place at intersections in built-up areas, especially at simple intersections. The lack of infrastructure in urban areas is a major factor in road accidents, which is why 62% of accidents occur at intersections without stop signs or traffic lights in built-up areas. Holiday periods increasingly record very high accident rates, including the frequency of trips for travel increases and the number of accidents, deaths and damage also increase, especially in the months of July and August, which experience a

very sharp increase. Number of accidents and victims in comparison with the other months of the year. From the analysis of these observations.

I can therefore identify the role and usefulness of the implementation of road safety governability actions which focus the efforts of all public actors to ensure a rapid gain for the reduction in the number of accidents and victims. Analysis of data published by NCPTA on statistics of road traffic injuries stopped in the month of December 2020 shows a gradual evolution of both the car fleet, road traffic, accidents and fatalities between the years 2011 and 2022 as follows:

- According to the statistics, we find that the number of fatalities is greater outside urban areas than in urban areas 5% against 1%, also the number of serious injuries is greater outside urban areas than in urban areas 10% against 6% while the number of minor injuries is higher in built-up areas than outside built-up areas (93% versus 85%), which therefore reflects that despite the large number of accidents in built-up areas, the number of fatalities remains limited compared to that outside built-up areas. which automatically sends us back to speeding and over speeding, and reducing the safe behavior of road users.

- Road fatalities over the first 9 months of 2021 amounted to 2,517 fatalities, up +28.7% compared to the same period of the previous year with the implementation of measures relating to state of health emergency in Morocco linked to Covid-19, including a reduction in the mobility of people to the strict minimum, in particular between the beginning of 2020 and the end of 2021, a period which corresponds to the implementation of the curfew throughout the National territory.

**Table 1: Evolution of accidents and victims between 2011 and 2022 in Morocco**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Accidents outside urban areas	18960	18949	18341	17149	21027	21638	24069	25114	22026	17921	18083	19209
Accidents in Agglomeration	48122	48202	49585	51130	56976	59042	65306	69830	79618	66664	64542	63031
Total Accidents	67082	67151	67926	68279	78003	80680	89375	94944	101644	84585	82625	82240
Fatal Accidents	3636	3531	3265	3021	3365	3317	3274	3292	3292	2728	2856	2925
killed	4222	4167	3832	3489	3776	3785	3726	3736	3736	3005	3059	3101
Wounded	102011	102350	102040	101242	115042	119162	130011	137998	149342	120343	127879	130499

The analysis of these data, allows us to raise that road accidents are still an alarming figure in Morocco, whose urban area Casablanca-Rabat-Kenitra registers more road risk than other territorial areas. The balance sheets of accidents in this area reveal the importance of the number of victims who succumb following road accidents, nearly 1000 people die on the roads, a quarter of which are pedestrians who are the most vulnerable users, an average of 3 deaths per day. Worse still, 5 killed are children under the age of 14. With regard to motorized 2-wheelers and 3-wheelers, the number of victims is constantly increasing, representing almost a quarter of those killed. (...).

Also, 16% of accidents involve a single vehicle, 70% of which concern light cars. Professional transport is not left out. Accidents caused by these transporters are generally serious, accounting for nearly 10% of fatalities. Moreover, the leading causes of accidents outside built-up areas are speeding (50%) and failure to take precautions (25%). Inside the urban perimeter, the opposite occurs, 40% of accidents are the direct consequence of the lack of precautions and 33% by speeding". This analysis allows us to deduce the relationship between the importance of the numbers of accidents and their consequences on the one hand and the geographical distribution of the cities where there are more economic and administrative activities, so that according to the two maps above, we can clearly see a kind of geographical concentration of the most fatal accidents in regions with significant economic activity, especially in the Casablanca-Kenitra area. Whose road risk constraints are:

- The behavior of drivers of cars, motorcycles and other transport vehicles is still one of the major factors in road accidents due to the careless circulation of drivers.

- A continuous increase in accidents, fatalities and injuries, of which 31.90% are pedestrians and 17.90% are users of two wheels, these two categories are therefore very exposed to road risks and account for nearly half of the fatalities and injured. But unfortunately children are still very vulnerable road users, of which almost 500 children under 15 were killed in 2010 due to road accidents.

- Thus speeding is in 2nd position with an average rate of 9.70% and in 3rd position we find non-respect of priority with an average rate of 7.40%. It is therefore for this reason that corrective actions must act in the first place on the unacceptable behavior of drivers through controls, sanctions, legislation, education and information.

- The average annual rate of drivers killed who are not wearing safety devices is very high, especially the seat belt and helmet for motorcycles, i.e. almost 81% of motorcycle drivers in built-up areas and almost 76% of motorcycle drivers outside agglomeration; as well as almost 57% of car drivers outside built-up areas and almost 87% of car drivers in built-up areas, these figures are very alarming.

Hence the need for those responsible for road safety to address appropriate prevention strategies capable of positively influencing these strategic issues.

**b- The strategic challenges of road safety in Morocco**

The strategic challenges have been drawn up by the public authorities for this last decade (2017 to 2026) under two five-year action plans: 2017-2021 and 2022-2026 according to the following matrix: developing safer roads, safer cars and safer behavior, to reduce the number of accidents and thus ensure road safety. And, this is the reason why Morocco has invested too much in terms of infrastructure and in terms of strategies since the year 2003 until today with the aim of reducing the number of victims, killed and injured , and generally to reduce the socio-economic cost of this road insecurity. Road traffic injuries represent a significant financial burden for countries, households and businesses. These socio-economic damages and costs are still on the rise, which they can only afford with difficulty, which hinders their desired economic and social development. The road safety investment budget must be increased annually to match the socio-economic cost of preventing serious accidents, deaths and victims due to traffic accidents. According to the International Road Safety Organization "if no strategic measures to reduce the damage of road accidents are taken immediately, it is estimated that traffic accidents will lead to 2.4 million deaths per year and thus becoming the 5th leading cause of death in the world. This is the reason why Morocco has invested too much in terms of strategies since the year 2003 until today with the aim of reducing the number of victims, killed and injured, and generally to reduce the cost socio-economic of this road insecurity.

**Table 2: Strategic challenges of road safety assessment in Morocco**

Strategic issues	killed	%	Particularity
<b>Pedestrians</b>	992	28%	Are vulnerable users 217 killed are children under 14 years old.
<b>2 and 3 motorized wheels</b>	885	24%	The number of victims is constantly increasing
<b>Accidents involving 1 single vehicle</b>	454	16%	70% of this type of accident involves light vehicles
<b>Children under 14 years old</b>	356	10%	61% of fatalities in this category are pedestrians
<b>professional transport</b>	305	8.70%	In the event of an accident involving professional transport, it is generally serious
<b>Total</b>	3050	86.70%	

It is from these figures that we can draw the following lessons: to develop an effective strategy, efforts must be focused by all public and private road safety partners on these five strategic issues which will to achieve the best results. Thus reading the databases collected from the last decade will make it possible to react correctly to reduce these alarming rates, and this is therefore the purpose of the implementation of the various integrated strategic emergency plans to improve the safety behavior of users, and road infrastructure throughout Morocco. The approach adopted to achieve this objective is based on an analysis and scientific evaluation of accident logy statistics which has made it possible to identify strategic issues for which the potential for reducing the number of victims or the severity of accident is more important to know

- Pedestrians (992 deaths, 28% of all fatalities);
- "2 and 3 motorized wheels" (852 deaths, 24% of all deaths);
- Accidents involving a single vehicle (545 fatalities, 16% of all fatalities);
- Children under 14 (356 deaths, 10% of all deaths);
- Professional transport (305 deaths, 8.7% of all fatalities).

The governability of safety against road risks is a major challenge for road safety in Morocco, in order to reduce accidents related to behavioral pathologies while driving or violations of the Highway Code. It is a key issue to reduce the number of fatalities. The State must have a control capacity that proves a level of competence. More than that, it will need to have a mechanism for disengaging and reverting to alternative approaches or triggering automated retraining when skill level is not reached. Control and police services have an obligation to adapt and adapt their actions to meet these challenges related to road safety. Indeed, new technologies have been added to the control tools, such as automatic radars, which make it possible to scrutinize risky behavior and intervene quickly. And recently, faced with a situation of resurgence of road accidents, Morocco was among the pioneer countries in the establishment of a national strategy for sustainable mobility as a measure to combat road accidents in Morocco.

**II. The sustainable mode of urban public transport: sustainable mobility**

Road transport is a very important axis for development at national and international level. The different categories of means of transport have experienced a significant increase in parallel with the economic

growth of our country. Economic growth is not necessarily the priority of development because development should not only be economic, but also social and environmental.

These three pillars are interdependent because the territory is an independent and unique system; all human beings are embarked on “the same vessel, there is no alternative planet. To prepare for these future challenges, a public policy aimed at modifying the behavior of the various actors will be decisive. It presupposes a very proactive involvement focused on evaluation, regulation, and financing for strong sustainability. Indeed, sustainable public transport plays a triple social, economic and environmental role allowing populations with no other means of getting around and carrying out their activity programme. Population growth, the development of the car fleet and the lack of public transport contribute to the increase in road risks. However, the problems of public transport favor the development of the private car in a reduced space requiring investments that are difficult to mobilize. Population density is an important factor likely to explain local differences in road risk rates.

The decline in the density of the residential fabric and its remoteness from the center of economic control generate new displacements. Of which, the risk is very high in the period and the night time of the trip. Road risk is perceived as a social fact. The urban areas of the large agglomerations in particular, Casablanca and Rabat-Kenitra endure the consequences of road insecurity on a daily basis. The future of public transport compared to the car depends on improving the performance of its road networks by developing specific programs. The interest of this proposal lies in the spatial approach recommended to reduce the capacity and fluidity of transport on the scale of the metropolis. This by resorting to multimodal transport on the one hand as a technical solution first, then to tackle the real problem of the urban area, namely the conflicting situation of modes of transport and the negative legacy of the transition from autonomous management to accreditation and then to delegated management. Far from remaining in the formalism of medium and long-term proposals.

#### **a- The Rabat-Salé and Casablanca tramway program**

The first two tram lines in Morocco have been in service in the cities of Casablanca-Rabat-Salé and since 2011 and 2012 respectively, transporting more than 60 million passengers per year. The cities of Rabat and Casablanca both have their own tram system, a more comfortable and safer means of transport. These two modern public transport systems on their own lane were introduced by the two Local Development Companies, the Rabat Salé Tramway Company (STRS) and Casa Transports, to improve mobility and the quality of life in the city for their citizens, to curb the increasing deterioration of public transport service and increasing levels of congestion.

Based mainly on a 2018 Casablanca household-travel survey and the 2014 census with the help of the High Commission for Planning, the ex-post evaluation of the first Casablanca and Rabat-Salé tram lines aimed to better analyze, qualify and quantify the impacts of these two exemplary projects. In the past, mobility was not at the center of public policies as a main lever for the city's economic competitiveness and a factor in improving the quality of life of its residents.

This mode of transport also has positive consequences for the districts crossed, allowing sustainable mobility, particularly in Casablanca and Rabat-Salé. Also, the survey notes that the tram projects were carried out within the allotted time and budget, noting that their operation is almost at a small equilibrium (revenues cover the operating expenses), which is an exception for the guided systems of mass. Over the past 10 years, this situation has changed and with the advent and success of the first tramway line, the public authorities have implemented an integrated policy of sustainable, connected and intermodal mobility unveiled in 2014 as part of the strategic 2015 – 2020 development of Casablanca, by allocating nearly half of the budget to it. This integrated policy is based on several essential pillars:

- The creation of a modern, connected, intermodal and integrated public transport network.
- Traffic regulation and the adoption of adequate traffic plans for current mobility flows.
- Upgrading and strengthening road infrastructure and city access.
- The adoption and implementation of a parking master plan adapted to the nature of each area.
- Adoption of logistics traffic organization measures in urban areas
- Mobility planning.

Thomas Delahais, who presented the results of a tram evaluation survey, during a webinar initiated by the French Development Agency (AFD), under the theme "the tram as a sustainable mass transport system: Evaluation ex-post of the Moroccan trams", noted that the trams have allowed a requalification of the spaces close to them, more pleasant to walk, safer, but also a projection of the modern city (pedestrian, airy, etc.) which concerns also the popular districts. Whose trams are generally clean and efficient and a tram ride costs only less than 10 dirhams. For her part, the Deputy Director General of the Tramway Company of Rabat Salé (STRS), Ms. Loubna Boutaleb, indicated, for her part, that this means of transport had an acceptability at the level of the agglomeration. Also the general manager of Casa Transports, Nabil Belabed also indicated that the tram is a mode of transport very appreciated by women, highlighting the interest that Casablancais have for the two tram lines of the city, in particular the second, of which, women prefer the tram to go to work, with +70% in

Casablanca compared to men and +150% in Rabat-Salé and moreover a sustainable mass transport system. The retrospective analysis of the introduction of trams in the urban area of Rabat-Kenitra and Casablanca was also articulated around the following axes:

- Synergetic urban transformation;
- Road safety;
- Optimizing the efficiency of modes and systems;
- Defragmentation and shortening of supply chains;
- Reducing unnecessary travel;
- The solution adapted to urban areas;
- Adaptation to infrastructure;
- Improving regulatory and financial tools;
- The use of low carbon energy.

With regard to the limits of trams, the survey highlights the lack of consistency with urban, socio-economic and environmental mobility policies, which limits the possible impacts of the tram, as a lever for socio-economic and territorial transformations, and as a factor of sustainable development, which shapes the urban area and questions the actions and mechanisms implemented by public authorities to improve the lifestyles and safety of their inhabitants. In this perspective, the public authorities tend to ensure a certain sustainable territorial development where the demographic and security issues are the most burdensome through advanced regionalization in order to rebalance the territories in difficulty by strengthening urban systems via intermunicipal cooperation, the dissemination of development of the agglomeration while diverting the itinerant risks to globalization by relatively autonomous territorial relays, economic diversification, the reconfiguration of trade networks and the specific governability of road safety. This in accordance with the territorial vision of 2050 built on both territorial logic and sectoral logic. Or a trend towards an evolving framework, combining openness to the global system and territorial balance.

#### **b- Territorial restructuring**

The municipality is responsible, within its territorial jurisdiction, for the missions of providing local services to citizens, within the framework of the powers assigned to it by virtue of this organic law, through their organization, their coordination and follow-up. Among the areas in which the municipality creates and manages the public services and facilities necessary for the supply, listed in article 83 of the organic law relating to municipalities, we cite urban public transport, traffic, traffic, signaling of public roads, etc.

By virtue of the principle of free administration on which the management by the council of the commune of its affairs is based. The improvement of public transport and road safety is entrusted to the municipalities which have the power to deliberate in a democratic manner and the power to execute its deliberations and decisions within the limits of its competences. The agglomeration of Casablanca Rabat Kenitra has a particular weight in the national territorial and socio-economic landscape. Its metropolitan vocation, increasingly confirmed, plays a structuring role at the national level. Referring to the results of the qualitative and quantitative survey, the analysis of the improvement of sustainable public transport systems: the tram and the bus in the urban areas of Casablanca-Kenitra as a means to meet the demand for more increasing in terms of sustainable mobility and road safety in Morocco.

In order to put in place a local management policy in favor of alternative mobility to the car, it is essential to analyze the reasons for and the conditions of travel. Knowledge of mobility and the existing offer in the territory makes it possible to determine what the issues are as well as the objectives and measures to be developed in order to propose an alternative offer according to the characteristics of the territory. Agglomerations that improve attractive mobility for the user (frequencies, timetables, prices, etc.) and acceptable from a financial and environmental point of view, by investing in rolling stock and setting up operating services and skills are the major cities of tomorrow.

The challenge of urban restructuring is to position the administrative and economic capital in the network of cities that matter on the world stage. This issue of internationalization refers to a national issue of socio-economic and demographic growth and which responds to a local and national political will. Urban restructuring is thought of as a way to make the city attractive, to change its image to attract investors, strengthen employment, and improve road safety. The concept of governability, defined as the reaffirmation, the singularity of situations, and carrying a critique of so-called universal solutions.

The idea of a universal tool would be rejected and the styles of government, and therefore the processes to be put in place. And the notion of governance has gradually imposed itself to designate the modes of collective decision-making extended beyond the institutional framework. In practice, the sustainable energy policy will aim to apply technological choices to ensure environmental protection and keep economic growth on the path of sustainable development. It is a real way of state and territorial governance based on durability and sustainability. Nevertheless, faced with the fear of traffic and road risk, all citizens try to assert their interests in

the face of the determination of the actors of urban restructuring for a possible modality of renewal of development projects for road safety. Yet our transportation systems remain far too dangerous.

We cannot tolerate any deaths on the road. Road accidents currently kill more than two people every minute worldwide. Since the advent of the automobile, more than 50 million deaths have been recorded on the world's roads, exceeding the death toll of World War I or some of the worst epidemics. Road fatalities were closely linked to poor infrastructure, unplanned urbanization, lax health systems and persistent inequalities, both within and between countries. Solving this problem will require strong leadership, bringing about transformations and restructuring at the highest levels of public power. Indeed, the State is responsible for regional planning, the reduction of regional disparities, the intensification of social solidarity, the distribution of wealth resulting from growth throughout the national territory, the creation an environment conducive to investment.

## **II. Conclusion**

Road risk is a multifactorial risk comprising human factors, infrastructure and vehicles. In this respect, it is necessary to have a systemic approach to road safety which takes into account all of these factors. For its part, the city is territory and has a territory, either through the play of institutions, or through the more informal play of its own activities. Of which, the agglomeration is also, by the functions it exercises, the originality of its composition and institutions, a place of meeting, therefore of mobility.

We can conclude that the urban part of a double territoriality. By penetrating the urban area by public transport and serving the city centre, sustainable mobility will unblock situations of congestion and widen the supply of public transport, the spin-offs of which will be beneficial for the urban municipality both financially and in terms of environment by reducing car traffic and competition between all means of transport on the same axes. In addition, the maximum offer is ensured by the demand for school, university, activities and leisure activities in high road safety. From this perspective, road insecurity is not inevitable. It requires taking into account a series of measures to bend the curve of road accidents in a frank way. Territory is first and foremost the support of sovereignty. It is often taken in the sense of a space based on the membership of human groups in a space that is both social and cultural, a domain of life and development, a zone of political influence or territorial development and security, i.e. a whole that is much more complex but also more personalized than the region.

Territories appear as a geographical reality socially constructed, over the centuries, by societies organized to meet their operational, security and development needs. Moroccan local and national decision-makers must take this new situation into account and think differently than in economic or financial terms. Privileging the road as has been done so far, voluntarily or to adapt to a specific context, amounts to thinking that inexpensive and good quality mobility will be available in a sustainable way, for all. But this question alone leads us to consider the decisions to be taken for the next few years differently. This is how the choice of a transport policy favoring sustainable mobility, partly due to urban sprawl, is gradually being called into question. To conduct an effective road safety policy which must mobilize all components of society and which must take into consideration:

- The commitment of each citizen to road safety;
- The protection of all road users;
- Anticipation to put new technologies at the service of road safety;
- Lower maximum speed on two-way roads without a central separator;
- Greater severity for additive driving and the use of mobile phones while driving;
- Ancreased pedestrian protection.

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Farid Youssef. "Exploratory Study of Road Safety in the Urban Area of Casablanca-Rabat-Salé-Kenitra." *IOSR Journal of Business and Management (IOSR-JBM)*, 25(1), 2023, pp. 12-19.