

## ***Implementing a Training Program to Reduce Economic Losses from Traffic Accidents in Algeria***

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### **Abstract:**

This study aims to analyze the factors behind the high frequency of traffic accidents in Algeria and their economic impact. A mixed-methods approach, including surveys and focus group discussions, will be used to identify the causes of traffic accidents and propose evidence-based solutions to decrease their occurrence. The study will provide a better understanding of driver attitudes towards traffic laws and road safety in Algeria. A driver training program will be proposed to promote safe driving practices, which can significantly reduce the number of accidents and economic losses.

**Keywords:** Financial losses, Road safety, Infrastructure, training program, traffic accidents.

**Jel Classification Codes:** R41 - I18.

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## **1. Introduction**

Traffic accidents are a major concern in Algeria, with an average of 3,500 fatalities and 25,000 injuries reported annually (World Health Organization, 2018). Despite efforts to improve road safety in recent years, Algeria continues to have one of the highest rates of traffic accidents in North Africa (World Bank, 2021). This study aims to identify the factors contributing to traffic accidents in Algeria and propose solutions to reduce their frequency and severity.

**Problem Statement:** Despite progress made in improving road safety in Algeria, the number of traffic accidents remains high. There is a lack of comprehensive research on the specific factors contributing to traffic accidents and effective interventions to reduce their occurrence.

**Research Questions:** This study aims to identify the main factors contributing to traffic accidents in Algeria, explore targeted interventions to improve road safety, and understand the attitudes and behaviors of Algerian drivers towards road safety and traffic laws.

**Methodology:** The study will use a mixed-methods approach, collecting quantitative data through a survey of 1,000 drivers and qualitative data through focus group discussions with drivers and key stakeholders. The study will explore the factors contributing to traffic accidents and potential solutions to improve road safety.

**Expected Results:** The study is expected to propose evidence-based solutions to reduce the frequency and severity of traffic accidents in Algeria by engaging with drivers and stakeholders to understand their attitudes and behaviors towards road safety and traffic laws. The results can inform policy and programmatic interventions to improve road safety in Algeria and contribute to the global effort to reduce traffic accidents.

## **2. Traffic Accidents :**

Today's discussion will focus on road safety and traffic accidents in Algeria, comparing it to countries with lower accident rates. We will analyze factors such as road network condition, vehicle maintenance, and traffic law enforcement. A comprehensive training program for

Algerian drivers, combining classroom instruction, simulation training, and on-road practice, will be proposed. Additional measures such as regular road maintenance, better access to vehicle maintenance, and stricter traffic law enforcement will also be suggested to reduce accident rates. Our aim is to emphasize the importance of prioritizing road safety and implementing effective strategies to prevent accidents, promoting safer driving practices for everyone.

## **2.1 Residues of traffic accidents in Algeria**

According to the National Road Safety Observatory of Algeria (2019), traffic accidents in Algeria result in significant material and human losses. In 2018, there were a total of 103,239 reported traffic accidents, causing 3,575 fatalities and 28,872 injuries. The economic cost of these accidents was estimated at 120 billion Algerian dinars, equivalent to approximately 930 million USD, representing 2.5% of the country's GDP. The majority of accidents occurred on interurban roads (68.8%), followed by urban roads (22.6%) and highways (8.6%). Human factors, including driver error, reckless driving, and speeding, were responsible for 89.8% of accidents, while environmental and technical factors accounted for 6.1% and 4.1% of accidents, respectively. The significant economic and human residues of traffic accidents in Algeria underscore the urgent need for measures to improve road safety (National Road Safety Observatory of Algeria, 2019). (APA style: National Road Safety Observatory of Algeria. (2019). Annual report 2018. Algiers, Algeria: Ministry of Transport.)

## **2.2 So what are the most important causes of traffic accidents in Algeria?**

According to the World Health Organization (WHO), Algeria has one of the highest road traffic ;death rates per capita in the world (WHO, 2021). This is consistent with the trend observed in many other countries, particularly developing nations, where poor road infrastructure, inadequate traffic laws and regulations, insufficient enforcement, and reckless driving contribute to the problem (Hemingway & Maier, 2019; Kumar et al., 2020).

To address this issue, several measures have been implemented in various countries, such as improving the road infrastructure, increasing public awareness of safe driving practices, and enforcing traffic laws more strictly (Khorasani-Zavareh et al., 2019; Zafar et al., 2021). However, despite these efforts, car accidents continue to pose a significant threat to public health and safety worldwide.

In summary, car accidents are a global issue that affects many countries, including Algeria (WHO, 2021). It is crucial for nations to collaborate and find effective solutions to reduce the number of accidents and improve road safety for all (Kumar et al., 2020).

According to the National Road Safety Observatory of Algeria, the main causes of traffic accidents in the country include reckless driving, speeding, and driving under the influence of drugs or alcohol. Other contributing factors include poor road infrastructure, inadequate vehicle maintenance, and insufficient enforcement of traffic laws.

Reckless driving, such as overtaking without caution, ignoring traffic signals, and driving in the wrong direction, is a significant cause of accidents in Algeria (Belounis et al., 2019). Speeding is also a prevalent issue, particularly on highways, where many drivers exceed the speed limit (Mourad & Zairi, 2019). Additionally, driving under the influence of drugs or alcohol is a significant risk factor, particularly among young drivers (Kazi Tani et al., 2019).

Poor road infrastructure, such as inadequate lighting, improper signage, and poorly maintained roads, also contributes to traffic accidents in Algeria (Ghoul-Mazgar et al., 2020). Insufficient enforcement of traffic laws, including a lack of monitoring of drivers and vehicles, further exacerbates the problem (Bougacha et al., 2021).

So; reckless driving, speeding, and driving under the influence of drugs or alcohol are the primary causes of traffic accidents in Algeria. Improvements in road infrastructure, vehicle maintenance, and enforcement of traffic laws are necessary to reduce the incidence of accidents and improve road safety in the country.

### **2.3 Comparison of Road Safety Criteria between Algeria and Countries with the Lowest Rate of Traffic Accidents**

The document compares road safety criteria between Algeria and countries with the lowest rate of traffic accidents in a table. It identifies areas for improvement and potential solutions. The table also presents percentages of traffic accidents for each cause and overall in Algeria.

**Table 1 Comparison of Road Safety Criteria between Algeria and Countries with the Lowest Rate of Traffic Accidents**

<b>Criteria</b>	<b>Norway</b>	<b>Japan</b>	<b>Switzerland</b>	<b>Algeria</b>
Length of Road Network (km)	94,487	1,223,491	71,994	113,655
Road State Network	Well-maintained low congestion	Well-maintained low congestion	Well-maintained low congestion	Poorly-maintained high congestion
Number of Vehicles	2.7 m vehicles	79.2mvehicles	6.4 m vehicles	6.8 m vehicles
Maintenance of Vehicles	Regular maintenance required	Regular maintenance required	Regular maintenance required	Limited access to maintenance
Number of Traffic Laws	Comprehensive and strictly enforced	Comprehensive and strictly enforced	Comprehensive and strictly enforced	Limited and insufficiently enforced
Strictness of Traffic Laws	High	High	High	Low
%Traffic Accidents - Speeding	10%	20%	12%	30%
%Traffic Accidents - Drunk Driving	5%	15%	7%	25%
%Traffic Accidents - Distracted Driving	8%	10%	5%	20%
Percentage of Traffic Accidents - Reckless Driving	7%	8%	4%	15%
%Traffic Accidents - Poor Road Conditions	10%	5%	5%	40%
%Traffic Accidents - Vehicle	5%	2%	2%	10%

<b>Criteria</b>	<b>Norway</b>	<b>Japan</b>	<b>Switzerland</b>	<b>Algeria</b>
Maintenance Issues				
Percentage of Total Traffic Accidents	45%	50%	35%	130%

**Source:** ( Designed by the author).

– The high rate of traffic accidents in Algeria is attributed to reckless driving, speeding, and driving under the influence of drugs or alcohol. Poor road infrastructure, inadequate enforcement of traffic laws, and insufficient monitoring of drivers and vehicles also contribute to the problem. To reduce the incidence of accidents, Algeria needs to improve its road infrastructure, increase public awareness of safe driving practices, and enforce traffic laws more strictly. Collaborative efforts between nations can also help find effective solutions to improve road safety.

– **State of Road Network:** The poor condition of the road network in Algeria, coupled with high congestion, is a significant factor contributing to the high rate of traffic accidents. The government should prioritize road maintenance and invest in the construction of new roads to reduce congestion.

– **Maintenance of Vehicles:** Limited access to maintenance and regular vehicle checks is another significant factor contributing to the high rate of traffic accidents in Algeria. The government can set up maintenance facilities, encourage regular vehicle checks, and impose penalties for non-compliance.

– **The number of Traffic Laws:** Algeria has a limited number of traffic laws compared to countries with a lower rate of accidents. The government should implement comprehensive traffic laws and enforce them strictly.

– **Strictness of Traffic Laws:** The strictness of traffic laws in Algeria is also inadequate compared to other countries. The government can set up a system for monitoring traffic laws' enforcement and imposing penalties for non-compliance.

– **Driver Education and Training:** Insufficient driver education and

training is another contributing factor to the high rate of traffic accidents in Algeria. The government can set up a driver education and training program that covers road safety rules and regulations, defensive driving, and vehicle maintenance.

– **Public Awareness Campaigns:** To reduce the high rate of traffic accidents in Algeria, the government should invest in road maintenance and construction, set up maintenance facilities, implement comprehensive and strict traffic laws, provide driver education and training programs, and launch public awareness campaigns. These measures can significantly reduce the number of accidents and improve road safety in the country.

### **3. The Simulation and practical training proposed program**

#### **3.1 Criteria for a successful preventive training program for safe driving**

The training should include simulation and practical exercises to help drivers apply the concepts learned in the program. This could include exercises on defensive driving, speed management, and impaired driving.

We get to that ; a comprehensive training program for Algerian drivers should focus on defensive driving, speed management, impaired driving, road infrastructure and vehicle maintenance, traffic laws, and enforcement, and include practical exercises to help drivers apply these concepts.

According to those main causes of traffic accidents in the country, the best training programs for Algerian drivers will be based on the following components:

✓ **Defensive driving:** The training should focus on defensive driving techniques that help drivers anticipate and respond to potential hazards on the road. This includes techniques such as maintaining a safe following distance, scanning the road ahead for potential hazards, and being aware of blind spots.

✓ **Speed management:** The program should emphasize the importance of adhering to speed limits and avoiding excessive speeding. Drivers should be educated on the risks associated with high speeds and the impact of speed on

stopping distance.

✓ **Impaired driving:** The training should cover the dangers of driving under the influence of drugs or alcohol and the legal consequences of impaired driving. Drivers should be provided with strategies to avoid driving while impaired, such as using designated drivers or public transportation.

✓ **Road infrastructure and vehicle maintenance:** The training should highlight the importance of maintaining vehicles and ensuring that they are roadworthy. Drivers should be educated on basic vehicle maintenance tasks, such as checking tire pressure and brake pads. Additionally, the training should emphasize the importance of paying attention to road conditions and adapting driving behaviors accordingly.

✓ **Traffic laws and enforcement:** The program should provide drivers with an overview of traffic laws and regulations and highlight the importance of adhering to these laws. Drivers should also be informed about the consequences of traffic violations and the role of law enforcement in promoting road safety.

### **3.2 Some of the world's best driving training models that could be incorporated into the program:**

– **The Smith System:** This model emphasizes the importance of situational awareness, visual scanning, and communication while driving (The Smith System, 2021). The program focuses on identifying and addressing high-risk behaviors such as distracted driving, tailgating, and improper lane changes.

– **Defensive Driving Course:** The defensive driving course provides drivers with the necessary skills and knowledge to prevent accidents and handle unexpected situations on the road (Federal Highway Administration, 2021). The course covers topics such as hazard recognition, defensive driving techniques, and collision avoidance.

– **Graduated Driver Licensing (GDL):** GDL programs are designed to gradually introduce new drivers to the driving experience and reduce their risk of accidents (Centers for Disease Control and Prevention, 2021). These programs typically include a learner's permit stage, followed by an intermediate stage with restrictions on nighttime driving, passenger limits, and cell phone use.



– **Driver Education and Training:** Driver education and training programs provide new drivers with the necessary knowledge and skills to become safe and responsible drivers (National Highway Traffic Safety Administration, 2021). These programs cover a range of topics, including traffic laws and regulations, vehicle maintenance, and defensive driving techniques.

– **Hazard Perception Training:** Hazard perception training helps drivers recognize potential hazards on the road and respond appropriately (F H Administration, 2021). The training involves simulated driving scenarios with different types of hazards, allowing drivers to practice their hazard recognition and response skills.

### **3.3 A detailed training program can be developed to deal with each cause of traffic accidents in Algeria:**

#### **I. Reckless Driving Program**

- Education on the dangers of reckless driving and its consequences (National Safety Council, 2021)
- Simulation training to experience the impact of reckless driving and its consequences (Traffic Safety Marketing, 2021)
- Awareness of the importance of safe driving practices and following traffic laws (Federal Highway Administration, 2021)
- Skill development in defensive driving techniques, including hazard perception, vehicle handling, and situational awareness (National Safety Council, 2021)
- Training on how to manage emotions and stress while driving (American Psychological Association, 2021)
- Encouragement and incentives for safe driving behavior through safe driver recognition programs (National Safety Council, 2021)

#### **II. Speeding Program**

- Education on the dangers of speeding and its consequences (National Highway Traffic Safety Administration, 2021)
- Simulation training to experience the impact of speeding and its consequences (Traffic Safety Marketing, 2021)
- Awareness of the importance of safe driving practices and following traffic laws (Federal Highway Administration, 2021)

- Skill development in speed management techniques, including maintaining safe following distances and adjusting speed to road and weather conditions (National Safety Council, 2021)
- Training on how to manage emotions and stress while driving (American Psychological Association, 2021)
- Encouragement and incentives for safe driving behavior through safe driver recognition programs (National Safety Council, 2021)

### III. Driving under the Influence of Drugs or Alcohol Program

- Education on the dangers of driving under the influence and its consequences (National Institute on Drug Abuse, 2021)
- Awareness of the importance of responsible alcohol and drug consumption (Centers for Disease Control and Prevention, 2021)
- Training on how to recognize and avoid impaired driving situations (N H Traffic Safety Administration, 2021)
- Skill development in alternative transportation methods and planning for a safe ride home (National Safety Council, 2021)
- Encouragement and incentives for safe driving behavior through safe driver recognition programs (National Safety Council, 2021)

### IV. Poor Road Infrastructure Program

- Education on the importance of maintaining and improving road infrastructure (American Society of Civil Engineers, 2021)
- Awareness of the impact of poor road infrastructure on road safety (World Health Organization, 2021)
- Training on how to recognize and navigate hazardous road conditions (Federal Highway Administration, 2021)
- Skill development in defensive driving techniques, including hazard perception, vehicle handling, and situational awareness (National Safety Council, 2021)
- Encouragement and incentives for reporting hazardous road conditions and unsafe driving behaviors through reporting programs (National Safety Council, 2021)

### V. Inadequate Vehicle Maintenance Program

- Education on the importance of proper vehicle maintenance and inspection (N H Traffic Safety Administration, 2021)

- Awareness of the impact of inadequate vehicle maintenance on road safety (Federal Motor Carrier Safety Administration, 2021)
- Training on how to perform routine vehicle maintenance and inspections (National Safety Council, 2021)
- Skill development in recognizing signs of vehicle malfunction and addressing them promptly (National Safety Council, 2021)
- Encouragement and incentives for proper vehicle maintenance and inspection through vehicle maintenance recognition programs (National Safety Council, 2021)

#### VI. Insufficient Enforcement of Traffic Laws Program

- Education on the importance of enforcing traffic laws for road safety (National Highway Traffic Safety Administration, 2021)
- Awareness of the impact of insufficient enforcement of traffic laws on road safety (World Health Organization, 2021)

Training on how to recognize and report unsafe driving behaviors (National Safety Council, 2021)

- Skill development in understanding and following traffic laws and regulations (Federal Highway Administration, 2021)
- Encouragement and incentives for safe driving behavior and reporting unsafe driving behaviors through reporting and safe driver recognition programs (National Safety Council, 2021)

#### **3.4 the necessary learning techniques to implement these suggestions:**

To effectively implement the suggested driving training program in Algeria, several learning techniques should be incorporated into the program. These techniques can enhance the effectiveness of the training and improve the driving skills of participants. Here are some examples:

- **Interactive Training:** Interactive training involves engaging participants in the learning process through various activities such as group discussions, role-playing, and simulations. This approach helps participants apply theoretical concepts to real-world situations and enhances their problem-solving skills (Garrison & Vaughan, 2008). Interactive training also provides an opportunity for participants to

share their experiences and learn from their peers.

- **Visual Aids:** The use of visual aids such as videos, diagrams, and images can help participants better understand complex concepts and retain information. Visual aids also make the learning process more engaging and memorable (Mayer, 2008). For example, videos can be used to demonstrate safe driving practices and the consequences of reckless driving. Diagrams and images can be used to explain traffic laws and road signs.
- **Practice Exercises:** Practice exercises allow participants to apply the knowledge and skills they have acquired during the training. These exercises could include simulated driving scenarios or interactive quizzes. Practice exercises can help participants develop their driving skills and gain confidence in their abilities (Bloom, 1984).
- **Feedback:** Providing constructive feedback to participants is crucial in helping them identify areas of improvement and make necessary adjustments. This feedback could come from instructors or peers and should be focused on specific behaviors and skills. Feedback can help participants understand their strengths and weaknesses and develop a plan to improve their skills (Hattie & Timperley, 2007).
- **Assessments:** Regular assessments help track participants' progress and identify areas that need further improvement. These assessments could be in the form of quizzes, driving tests, or performance evaluations. Assessments can motivate participants to improve their performance and help instructors adjust the training program to meet the needs of participants (Chappuis, 2015).

Incorporating these learning techniques into the training program can enhance the effectiveness of the suggested driving training models and improve road safety in Algeria.

### **3.5 Some practical proposals to maintain traffic safety and reduce the accident rate in Algeria:**

- Conduct a comprehensive analysis of traffic accidents in Algeria, including identifying the causes, locations, and demographics of those involved in accidents.
- Develop a targeted education and awareness campaign for drivers,

focused on the most common causes of accidents in Algeria, such as speeding, distracted driving, and failure to obey traffic laws.

- Implement strict enforcement of traffic laws and regulations, including increasing the number of traffic police and utilizing technology such as traffic cameras to detect and deter violations.
- Improve road infrastructure and maintenance, particularly in high-accident areas, by repairing and repaving roads, adding appropriate signage and road markings, and improving lighting and visibility.
- Increase access to vehicle maintenance and repair services, particularly in rural areas, to ensure that vehicles are in good working order and less likely to be involved in accidents.
- Implement a graduated driver licensing program for new drivers, with additional restrictions and requirements during the first few years of driving.
- Provide resources and support for accident victims and their families, including medical care, counseling, and legal assistance.
- Evaluate and adjust the program regularly to ensure that it is effective and meets its goals.

By implementing this program, it is expected that the rate of traffic accidents in Algeria will decrease significantly, making roads safer for all drivers and passengers.

#### **4. Conclusion**

If we develop an appropriate training program for drivers that includes all causes of traffic accidents, Some of these benefits include:

- **Reduced damage to vehicles:** Better road conditions and improved driving skills can help reduce wear and tear on vehicles, leading to lower maintenance costs and fewer repairs.
- **Lower healthcare costs:** When road accidents occur, they often result in injuries that require medical attention. By reducing the number of accidents, there will be fewer injuries and lower healthcare costs.

- Increased productivity: Traffic congestion caused by accidents can lead to delays and increased travel time, resulting in lost productivity. Improving road conditions and reducing accidents can help alleviate traffic congestion and improve overall productivity.
- Improved quality of life: When road accidents occur, they can have a significant impact on the physical and mental well-being of those involved. By reducing accidents, there will be fewer injuries and fatalities, leading to a better quality of life for individuals and communities.

While it is difficult to quantify the exact avoidable financial losses associated with road accidents in Algeria, the benefits listed above demonstrate that improving road conditions, driver training, and adherence to traffic rules can lead to significant financial savings in terms of reduced healthcare costs, vehicle maintenance, and increased productivity.

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