

Measuring the Economic Burden of Road Traffic Accidents: Assessment Methodologies and Their Impact on Road Safety Policies

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ABSTRACT

This research examines the economic burden of road traffic accidents, focusing on measurement methodologies, public policy efficiency, and reform challenges. Employing descriptive-analytical and comparative approaches, the study analyzes international reports and peer-reviewed literature. Findings reveal that the economic cost exceeds 3% of global GDP annually, ranging from 1.85% to 3.3% in various countries, with indirect costs (productivity and income loss) constituting up to 95.7% of total burdens. Two main measurement approaches are identified: the Human Capital Approach used in developing countries and the Willingness-to-Pay Approach in developed nations. International experiences from Singapore, Slovakia, and Brazil demonstrate that integrated policies combining technology, legislation, infrastructure, and awareness significantly reduce accidents and costs, with return on investment reaching \$6.30 per dollar spent. The research concludes that road safety investment is a highly effective development strategy, recommends establishing national road safety funds and specialized institutions, and calls for unified measurement methodologies and enhanced Arab and international cooperation. Ultimately, reducing these burdens protects human capital, saves lives, and advances sustainable development.

Keywords: Economic Burden, Road Traffic Accidents, Human Capital Approach, Willingness to Pay, Public Policies, Road Safety

JEL Classification: R41, I18, J28, K32.

Introduction

Road traffic accidents are among the most prominent challenges facing contemporary societies, not only in terms of tragic human losses but also in terms of the enormous economic burdens borne by individuals, communities, and nations alike. This phenomenon has become classified as a priority health and development issue, given its multifaceted repercussions that extend to the health sector, insurance and social security systems, the labor market, and countries' gross domestic product. Estimates from the World Health Organization indicate that road traffic accidents cause approximately "1.19 million deaths" annually worldwide, and

injure between “20 to 50 million people” with non-fatal injuries, many of which result in permanent disabilities, and they represent the leading cause of death among the age group 5-29 years ([World Health Organization Report, 2023, p. 2]).

Recent studies show that the economic burden of road traffic accidents constitutes a tangible percentage of countries' GDP, ranging between 1.85% and 2.35% in Turkey during the period 2018-2024 ([Gazi University Report, 2026, p. 1]), and reaching 3.3% of GDP in Iran during 2021-2022 ([Omranikhoo et al. Study, 2026, p. 5]). These statistics reflect a grim reality that threatens sustainable development efforts and hinders the achievement of the Sustainable Development Goals, which aim to halve the number of deaths and injuries from road traffic accidents by 2030.

Research Problem

From this context, the main research problem is defined by the following question:

How can the economic burden of road traffic accidents be measured, the efficiency of public policies addressing them be evaluated, and the possible reform challenges for reducing this burden be identified?

To address this problem, it can be divided into three sub-problems:

1. What are the components of the economic cost of road traffic accidents, and what are the methodologies adopted for their measurement at both micro and macro levels?
2. How efficient are public policies and the institutional and legal framework in reducing the economic burden of road traffic accidents?
3. What are the leading international experiences that can be utilized to improve the efficiency of public intervention and develop innovative financing mechanisms?

Research Hypotheses

To answer these questions, the following hypotheses can be formulated:

1. First Hypothesis: The economic cost of road traffic accidents exceeds 2% of GDP in most countries, distributed between direct costs (medical and administrative) and indirect costs (loss of productivity and reduced welfare). The variation in this percentage between countries is attributed to differences in measurement methodologies and the nature of economic systems, with studies indicating that indirect costs constitute the largest share of total burdens, reaching up to 95.7% in some cases ([Omranikhoo et al. Study, 2026, p. 4]).
2. Second Hypothesis: The efficiency of public policies in reducing the economic burden of accidents is linked to the degree of integration between the legal, institutional, and technological frameworks, and the level of political will allocated to funding road safety programs. The total economic costs of road traffic accidents in Slovakia for 2024 are estimated at approximately €1.25 billion, confirming the magnitude of the social and economic burden and justifying investment in safety measures ([Poliak & Škorvánková Study, 2026, p. 2]).
3. Third Hypothesis: Economic analyses show that investment in improving infrastructure and implementing safety measures yields an economic return that far exceeds the cost. The Middle East and North Africa region is among the most affected by road traffic accidents, with mortality rates reaching 34.2 deaths per 100,000 population among youth, at an estimated cost of \$7.4 billion annually ([Choueiri et al. Report, 2015, p. 1]).

Research Methodology

This research employed the ****descriptive-analytical approach**** in studying the economic burden of road traffic accidents, through reviewing theoretical literature, international reports, and previous studies. The ****comparative approach**** was also utilized to extrapolate leading international experiences in this field and analyze public policies adopted in various countries. The research relied on data and statistics from reputable international organizations, and peer-reviewed academic studies published in scientific journals indexed in global databases.

Research Structure

This research is divided into four main chapters, as follows:

- Chapter One: Theoretical and Conceptual Framework of the Economic Burden of Road Traffic Accidents.
- Chapter Two: Methodologies for Measuring the Economic Cost of Road Traffic Accidents.
- Chapter Three: Analysis of the Economic Burden of Road Traffic Accidents and Their Impact on Economic Sectors.
- Chapter Four: Efficiency of Public Policies and Leading International Experiences.

Research Objectives

This research aims to achieve the following objectives:

- Identify the components of the economic cost of road traffic accidents and review the methodologies adopted for their measurement at both micro and macro levels.
- Evaluate the efficiency of public policies and the institutional and legal framework in reducing the economic burden of road traffic accidents.
- Analyze leading international experiences that can be utilized to improve the efficiency of public intervention and develop innovative financing mechanisms for road safety programs.
- Formulate practical recommendations and reform proposals to enhance the effectiveness of public policies and reduce the economic burden of road traffic accidents, particularly in the Arab region and developing countries.

Significance of the Study

This study derives its significance from addressing a critical research gap in Arab and developing countries regarding the precise measurement of the economic burden of road traffic accidents, where mortality rates are among the highest globally. It provides policymakers with empirical evidence demonstrating that investment in road safety yields a return of approximately \$6.30 per dollar spent, supports evidence-based resource allocation and institutional reforms, and contributes to achieving Sustainable Development Goal 3.6 by analyzing successful international experiences from Singapore, Slovakia, and Brazil that can be adapted to regional contexts. Furthermore, it promotes international cooperation and the establishment of specialized road safety bodies, ultimately preserving human capital, reducing inequalities, and advancing sustainable development.

1- Theoretical and Conceptual Framework of the Economic Burden of Road Traffic Accidents

This chapter establishes the theoretical and conceptual framework for analyzing the economic burden of road traffic accidents by defining the concept, tracing its evolution, and classifying

its cost components into direct, indirect, and intangible costs, thereby providing the essential foundation for the measurement methodologies examined in later chapters.

1-1: Concept of the Economic Burden of Road Traffic Accidents and Its Evolution

The economic burden of road traffic accidents is defined as the total direct and indirect costs borne by societies as a result of injuries and deaths caused by traffic accidents. This concept has evolved over time from merely considering direct medical and treatment costs to a broader perspective that includes lost productivity, material damage, administrative and legal costs, as well as social and psychological effects that translate economically into a decline in quality of life and an increase in social care burdens ([World Bank Report, 2023, p. 2]).

Studies indicate that the economic costs of road traffic accidents include several main components, which can be classified as shown in the following table:

Table (1): Components of the Economic Costs of Road Traffic Accidents

Cost Type	Components	Contribution Percentage (According to Iran Study 2021-2022)
Direct Costs	Medical and hospital costs, health staff salaries, medication costs, ambulance costs	4.3%
Indirect Costs	Income loss due to death, productivity loss due to disability, care costs	95.7%
Intangible Costs	Pain and suffering, loss of quality of life, psychological effects	Not calculated in some studies

Source: (Omranikhoo, H., Nicknam, A., Salari, H. et al. "Economic burden of road traffic injuries in Iran; time to make tough decisions: a cross-sectional study." *BMC Health Services Research*, 2026, p. 4). Reference Type: Peer-reviewed journal article. Details: *BMC Health Services Research* journal, Volume 26, Issue 1, pp. 1-10, Publisher: Springer Nature, Country: United Kingdom, Year: 2026.

It is notable from the previous table that indirect costs constitute the largest share of total economic burdens, reaching 95.7% of total costs in the Iranian case study, with income loss due to death representing the largest share of these indirect costs at 75.3% ([Omranikhoo et al. Study, 2026, p. 4]).

Hasanli & Safarova (2026, p. 2) emphasize that the economic burden of road traffic accidents is not limited to direct losses borne by households but extends to the redistribution of losses among different institutional sectors, with households bearing the largest share of primary losses at 47.8%, followed by the corporate sector at 39.3%, then the government sector at 12.9% ([Hasanli & Safarova Study, 2026, p. 2] - Reference Type: Peer-reviewed journal article).

1-2: Classification of Economic Costs of Road Traffic Accidents

1-2-1: Direct Costs

Direct costs are defined as the actual expenditures incurred as a result of the accident, and include:

- **Medical Costs:** Include hospital treatment costs, medications, surgical operations, and rehabilitation. A study by Kpe et al. (2024, p. 3) indicates that direct costs in Ghana amounted

to approximately 1,973,801.28 Ghanaian cedis (equivalent to \$164,483.44 USD), representing 79.1% of total direct and indirect costs from the patient's perspective ([Kpe et al. Study, 2024, p. 3] - Reference Type: Peer-reviewed journal article).

- **Administrative Costs:** Include police costs, legal and judicial procedures, and accident management costs.

- **Property Damage:** Include costs of repairing vehicles and damaged infrastructure.

1-2-2: Indirect Costs

Indirect costs represent the loss of productivity and income resulting from death or injury, and include:

- **Loss of Productivity:** Estimated based on the income the individual would have earned throughout their expected working life.

- **Care Costs:** Include costs of caring for the injured by family members or caregivers.

A study by Kpe et al. (2024, p. 3) indicates that indirect costs in Ghana amounted to 520,309.46 Ghanaian cedis (equivalent to \$43,359.12 USD), representing 20.9% of total costs, noting that uninsured patients bear significantly higher costs than insured patients ([Kpe et al. Study, 2024, p. 3]).

1-2-3: Intangible Costs

Intangible costs include pain, suffering, and loss of quality of life, and are considered among the most difficult cost components to measure. A study by Singh & Bura (2020, p. 1) indicates that road traffic accidents account for approximately 2.6% of total GDP losses in countries, taking into account intangible human losses that are not included in official calculations ([Singh & Bura Study, 2020, p. 1] - Reference Type: Peer-reviewed journal article. Details: International Journal of Engineering and Advanced Technology, Volume 9, Issue 3, Publisher: Blue Eyes Intelligence Engineering & Sciences Publication, Country: India, Year: 2020).

2- Methodologies for Measuring the Economic Burden of Road Traffic Accidents

This chapter reviews the main methodological approaches used to quantify the economic costs of road traffic accidents, focusing on the Human Capital Approach (HC) and the Willingness to Pay Approach (WTP), while comparing their theoretical foundations, advantages, limitations, and applicability in different economic contexts.

2-1: Human Capital Approach (HC)

2-1-1: Theoretical Foundations of the Approach

The Human Capital Approach estimates costs based on the loss of future productivity of individuals who die or are injured in accidents. This is calculated by estimating the income the individual would have earned throughout their expected working life, discounting current and future productivity values. This approach is considered more suitable for achieving the goal of maximizing national wealth; however, it does not take into account the non-material aspects of human losses, such as pain, suffering, and loss of quality of life ([ECMT Report, 2001, p. 1]). Economic literature indicates that this approach is widely used in studies focusing on tangible material costs, and can be calculated using the following equation:

$$\text{Total Cost} = \sum (\text{Expected Annual Income} \times \text{Remaining Working Years} \times \text{Discount Factor})$$

This approach has been applied in many international studies, as shown in the following table:

Table (2): Estimates of the Economic Cost of Road Traffic Accidents According to the Human Capital Approach in Selected Countries

Country	Time Period	Cost as Percentage of GDP	Source
Iran	2021-2022	3.3%	Omranikhoo et al., 2026, p. 5
Turkey	2018-2024	1.85% - 2.35%	Gazi Üniversitesi, 2026, p. 1
Nigeria	2016-2020	1.18 Billion Naira (Jimeta-Song Road)	Ahmad & Usuh, 2025, p. 1
India	2016-2018	2.6% of GDP	Singh & Bura, 2020, p. 1

Source: Compiled by the researcher based on the referenced studies*

Details of References in the Table:

1. Omranikhoo, H., Nicknam, A., Salari, H. et al. (2026). "Economic burden of road traffic injuries in Iran; time to make tough decisions: a cross-sectional study." **BMC Health Services Research**, 26(1), 1-10. Publisher: Springer Nature, Country: United Kingdom. Reference Type: Peer-reviewed journal article.
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2-1-2: Advantages and Disadvantages of the Human Capital Approach

Advantages:

- Relatively easy to apply and calculate compared to other methodologies.
- Relies on objective, quantifiable data (income, working years, discount rates).
- Widely used in comparative studies between countries ([ECMT Report, 2001, p. 2]).

Disadvantages:

- Limited to tangible material costs and ignores non-material costs (pain and suffering).
- Does not take into account the social value of human life.
- Relies on future estimates that carry a degree of uncertainty ([World Bank Report, 2023, p. 3]).

2-2: Willingness to Pay Approach (WTP)

2-2-1: Theoretical Foundations of the Approach

The Willingness to Pay Approach estimates the amount individuals are willing to pay to avoid the risks of death or injury. This approach takes into account the value individuals place on their

lives and safety, thus including intangible costs that the Human Capital Approach overlooks ([ECMT Report, 2001, p. 1]).

Economic literature indicates that the WTP approach is widely used in developed countries, especially in Europe, where the European Commission recommends its use in evaluating the external costs of transport, expressed through the concept of "Value of Statistical Life" (VSL). A recent study covering four European countries (Belgium, France, Germany, and the Netherlands) demonstrated the use of the Stated Choice methodology to estimate willingness to pay for reducing fatal and serious accident risks ([de Blaeij et al. Study, 2022, p. 2]).

Reference Details:

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2-2-2: Advantages and Disadvantages of the Willingness to Pay Approach**Advantages:**

- Includes intangible costs (value of life, pain and suffering).
- Reflects individual preferences and social values.
- Aligns with modern economic principles for public policy evaluation.

Disadvantages:

- Relies on hypothetical data that may not reflect actual behavior.
- May be affected by methodological biases (scenario bias, response bias).
- Requires costly and complex surveys in design and analysis ([ECMT Report, 2001, p. 2]).

2-3: Comparison Between the Two Approaches

Table (3): Comparison Between the Human Capital Approach and the Willingness to Pay Approach

Comparison Criteria	Human Capital Approach (HC)	Willingness to Pay Approach (WTP)
Measured Concept	Loss of material productivity	Full value of safety (material and non-material)
Data Type	Objective data (income, working years)	Subjective/hypothetical data (willingness to pay)
Costs Included	Direct and indirect only	Direct, indirect, and intangible
Measured Accuracy	Accurate in measuring an incomplete concept	Measures the correct concept but with less precision
Ease of Application	Easy and low cost	Difficult and costly
International Usage	Widely used in developing countries	Widely used in developed countries

Source: Compiled by the researcher based on (European Conference of Ministers of Transport, 2001, p. 1) and (Omranikhoo et al., 2026, p. 4)

3- Analysis of the Economic Burden of Road Traffic Accidents and Their Impact on Economic Sectors

This chapter analyzes the global economic cost of road traffic accidents and examines their multidimensional impacts on key economic sectors, particularly the health sector and the labor market, highlighting the disproportionate burden borne by low- and middle-income countries and the significant losses in productivity and human capital

3-1: Global Economic Cost of Road Traffic Accidents

International estimates indicate that road traffic accidents cost the global economy approximately ****3% of global GDP**** annually, equivalent to trillions of dollars per year ([World Bank Report, 2023, p. 2]). This percentage varies significantly between countries and regions, being higher in low- and middle-income countries, which bear more than 90% of road traffic fatalities despite having only about 60% of the world's vehicles ([WHO Report, 2023, p. 2]).

Table (4): Economic Cost of Road Traffic Accidents by Region (Estimates)

Region	Annual Deaths (Estimated)	Economic Cost as Percentage of GDP
Sub-Saharan Africa	Highest globally	Not specified
Middle East and North Africa	34.2 deaths/100,000 for youth	\$7.4 billion annually
Europe	~6 deaths/100,000	Below global average
South Asia	High	2.6% of GDP (India)

Source: Compiled by the researcher based on (Choueiri et al., 2015, p. 1), (Singh & Bura, 2020, p. 1), and (OPEC Fund, 2024, p. 2)

Details of References in the Table:

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3-2: Impact of Road Traffic Accidents on the Health Sector

Injuries resulting from road traffic accidents place a significant burden on health systems, requiring intensive medical services including first aid, emergency care, surgical operations, and long-term rehabilitation. A study by Omranikhoo et al. (2026, p. 4) indicates that direct medical costs constitute only about 4.3% of total economic burdens in Iran; however, this figure does not reflect the full burden on the health system, as public hospitals bear a large portion of these costs that are not counted among direct expenses borne by individuals.

A study by Kpe et al. (2024, p. 3) in Ghana shows that direct medical costs can reach 79.1% of total costs borne by the patient, highlighting the significant gap between countries in terms of

the distribution of health burdens between the public sector and individuals ([Kpe et al. Study, 2024, p. 3]).

3-3: Impact of Road Traffic Accidents on the Labor Market and Productivity

Loss of productivity is the largest component of the economic burden of road traffic accidents, as the majority of accident victims are from economically active age groups (18-59 years). Estimates by Singh & Bura (2020, p. 1) indicate that productivity losses represent the largest share of total economic costs, with two-thirds of road traffic fatalities occurring among working-age individuals ([WHO Report, 2023, p. 2]).

Table (5): Distribution of Economic Burdens by Cost Type in the Iranian Case Study

Cost Type	Percentage	Main Component
Indirect Costs	95.7%	Income loss due to death (75.3%)
Direct Costs	4.3%	Health staff salaries (34.3% of direct)

Source: (Omranikhoo, H., Nicknam, A., Salari, H. et al., 2026, p. 4).*

4- Efficiency of Public Policies and Leading International Experiences

This chapter evaluates the effectiveness of public policies in reducing the economic burden of road traffic accidents and draws lessons from leading international experiences in Singapore, Slovakia, and Brazil, while proposing practical recommendations and innovative financing mechanisms to enhance policy efficiency and institutional performance.

4-1: Effectiveness of Public Policies in Reducing Economic Burdens

International experiences indicate that effective public policies can make a significant difference in reducing the number of accidents and fatalities, thereby reducing economic burdens. Slovakia's experience shows a notable decrease in annual accidents from more than 50,000 to approximately 11,500, and a decrease in fatalities from 600 to 262 between 2000 and 2024, demonstrating the effectiveness of national road safety strategies ([Poliak & Škorvánkova Study, 2026, p. 1]).

The Middle East and North Africa region is among the most affected by road traffic accidents, with mortality rates reaching 34.2 deaths per 100,000 population among youth, at an estimated cost of \$7.4 billion annually ([Choueiri et al. Report, 2015, p. 1]). Choueiri et al. (2015, p. 1) indicate that these high costs highlight the urgent need to develop national road safety strategies in the region.

4-2: Leading International Experiences

4-2-1: Singapore's Experience

Singapore is one of the most successful countries in the field of road safety, having adopted an integrated approach combining advanced technology, strict legislation, and smart urban planning. The advanced electronic monitoring system, high fines for violations, and investment in public transport have contributed to reducing mortality rates to the lowest levels globally.

4-2-2: Brazil's Experience

Brazil implemented a national road safety law in 1997, followed by an updated law in 2014 that included tightening penalties for drunk driving, increasing fines, and improving emergency systems. These reforms contributed to a tangible reduction in mortality rates over the past two decades.

Table (6): Leading International Experiences in Reducing the Economic Burden of Road Traffic Accidents

Country	Main Strategy	Achieved Results
Singapore	Electronic monitoring, strict legislation, urban planning	Lowest global mortality rate
Slovakia	National road safety strategy	Reduction in accidents from 50,000 to 11,500
Brazil	Penalty tightening, improving emergency systems	Tangible reduction in mortality rate

Source: Compiled by the researchers

4-3: Reform Challenges and Recommendations

Based on the previous analysis, a set of recommendations and proposed reforms can be formulated to reduce the economic burden of road traffic accidents:

- 1. Developing the Institutional Framework:** Establish specialized national road safety authorities, and coordinate efforts among various government sectors (health, transport, interior, planning).
- 2. Strengthening the Legal Framework:** Tighten penalties for serious traffic violations, and enforce strict laws on driving under the influence of drugs and alcohol, and mobile phone use while driving.
- 3. Investing in Technology and Infrastructure:** Improve road quality, install electronic monitoring systems, and develop emergency response systems.
- 4. Developing Innovative Financing Mechanisms:** Establish national road safety funds, and allocate a portion of insurance revenues and fines to fund prevention programs and infrastructure.
- 5. Enhancing Community Awareness:** Launch national awareness campaigns targeting the most vulnerable groups, especially youth, and incorporate road safety education into school curricula.
- 6. Strengthening International Cooperation:** Exchange expertise and successful experiences between countries, especially in areas of technology, legislation, and data systems.

Conclusion

Testing the Three Hypotheses

The first hypothesis stated that “the economic cost of road traffic accidents exceeds 2% of GDP in most countries, distributed between direct and indirect costs, and the variation in this percentage between countries is attributed to differences in measurement methodologies and the nature of economic systems”.

The results showed that this hypothesis is “correct” The cost as a percentage of GDP reached 3.3% in Iran ([Omranikhoo et al. Study, 2026, p. 5]), ranged between 1.85% and 2.35% in Turkey ([Gazi University Report, 2026, p. 1]), reached 2.6% in India ([Singh & Bura Study, 2020, p. 1]), and approximately 3% globally ([World Bank Report, 2023, p. 2]). It was also confirmed that indirect costs constitute the largest share (95.7%), with income loss due to death representing 75.3% of these ([Omranikhoo et al. Study, 2026, p. 4]). It was established that the

variation in the percentage between countries is due to differences in measurement methodologies (Human Capital Approach in developing countries and WTP in developed countries) and the nature of economic systems, income levels, and population structures ([ECMT Report, 2001, p. 1]).

The second hypothesis stated that “the efficiency of public policies in reducing the economic burden of accidents is linked to the degree of integration between the legal, institutional, and technological frameworks, and the level of political will allocated to funding road safety programs”.

Practical experiences proved the “correctness of this hypothesis”. Slovakia's experience showed that adopting a national road safety strategy contributed to reducing accidents from 50,000 to 11,500 and fatalities from 600 to 262 between 2000 and 2024 ([Poliak & Škorvánková Study, 2026, p. 1]). Furthermore, integration between legislation, technology, and infrastructure yields an investment return estimated at \$6.30 for every dollar spent ([World Bank Report, 2023, p. 4]). However, the hypothesis requires further specification, as the effectiveness of application and monitoring is no less important than institutional and legal integration ([WHO Report, 2023, p. 2]).

The third hypothesis stated that “investment in improving infrastructure and implementing safety measures yields an economic return that far exceeds the cost”.

The results demonstrate the “correctness of this hypothesis”. In the Middle East and North Africa region, where mortality rates reach 34.2 per 100,000 population among youth at a cost of \$7.4 billion annually ([Choueiri et al. Report, 2015, p. 1]), investment in road safety is among the most worthwhile investments. The economic return is also achieved through reducing treatment costs, reducing lost workdays, lowering insurance premiums, and improving quality of life ([World Bank Report, 2023, p. 2]). However, achieving this return requires long-term commitment, as some safety measures need time to show their full effects, and the absence of monitoring and follow-up may reduce economic viability.

Answering the Sub-Questions

Answer to Sub-Question One: What are the components of the economic cost of road traffic accidents, and what are the methodologies adopted for their measurement?

The analysis showed that cost components are divided into three main types: “Direct costs” (medical expenses, administrative costs, and property damage); “Indirect costs” (loss of productivity and income, and care costs); and “Intangible costs” (pain and suffering, and loss of quality of life) ([Kpe et al. Study, 2024, p. 3]; [Singh & Bura Study, 2020, p. 1]).

Regarding methodologies, two main approaches were identified: “The Human Capital Approach (HC)” which focuses on future productivity loss and is most commonly used in developing countries; and “The Willingness to Pay Approach (WTP)” which includes intangible costs and is most commonly used in developed countries ([ECMT Report, 2001, p. 1]; [de Blaeij et al. Study, 2022, p. 2]). Both approaches have advantages and disadvantages, and the choice of the most appropriate depends on the nature of the study, available data, and allocated budget.

Answer to Sub-Question Two: How efficient are public policies in reducing the economic burden?

The results showed that the efficiency of public policies depends on the degree of their integration with the institutional, legal, and technological framework, and the effectiveness of application and monitoring. International experiences, particularly in Slovakia, Brazil, and Singapore, have proven that integrated policies are the most effective in reducing accidents and fatalities ([Poliak & Škorvánkova Study, 2026, p. 1]). However, the mere existence of advanced legislation and institutions is not sufficient; there must be political will and sustainable funding, as the lack of resources allocated to road safety is among the most prominent obstacles ([World Bank Report, 2023, p. 5]).

Answer to Sub-Question Three: What are the leading international experiences that can be utilized?

This research identified three leading international experiences: “The Singaporean experience”, exemplary in technology and urban planning; “The Slovakian experience” in adopting an integrated national strategy; and “The Brazilian experience” in comprehensive legislation and penalty tightening. Regarding innovative financing mechanisms, the results indicated the possibility of establishing national road safety funds financed from insurance revenues, traffic fines, and vehicle fees, in addition to public-private partnerships and international financing.

General Summary

The economic burden of road traffic accidents is among the greatest development challenges, exceeding 3% of global GDP annually, distributed between direct and indirect costs, with the latter constituting the largest share. International experiences have proven that integrated and effective public policies can make a tangible difference in reducing accidents and fatalities, and that the economic return on investment in road safety far exceeds the cost.

However, this research reveals gaps in Arab studies, which lack comprehensive field studies to measure economic burdens using precise scientific methodologies, necessitating further in-depth field research. The research recommends strengthening Arab and international cooperation, establishing specialized bodies, unifying measurement and statistical methodologies, and developing unified databases. Ultimately, reducing the economic burden of road traffic accidents is an investment in human capital, protection of lives, and enhancement of sustainable development—a goal that requires collective cooperation among governments, civil society, the private sector, and individuals alike.

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