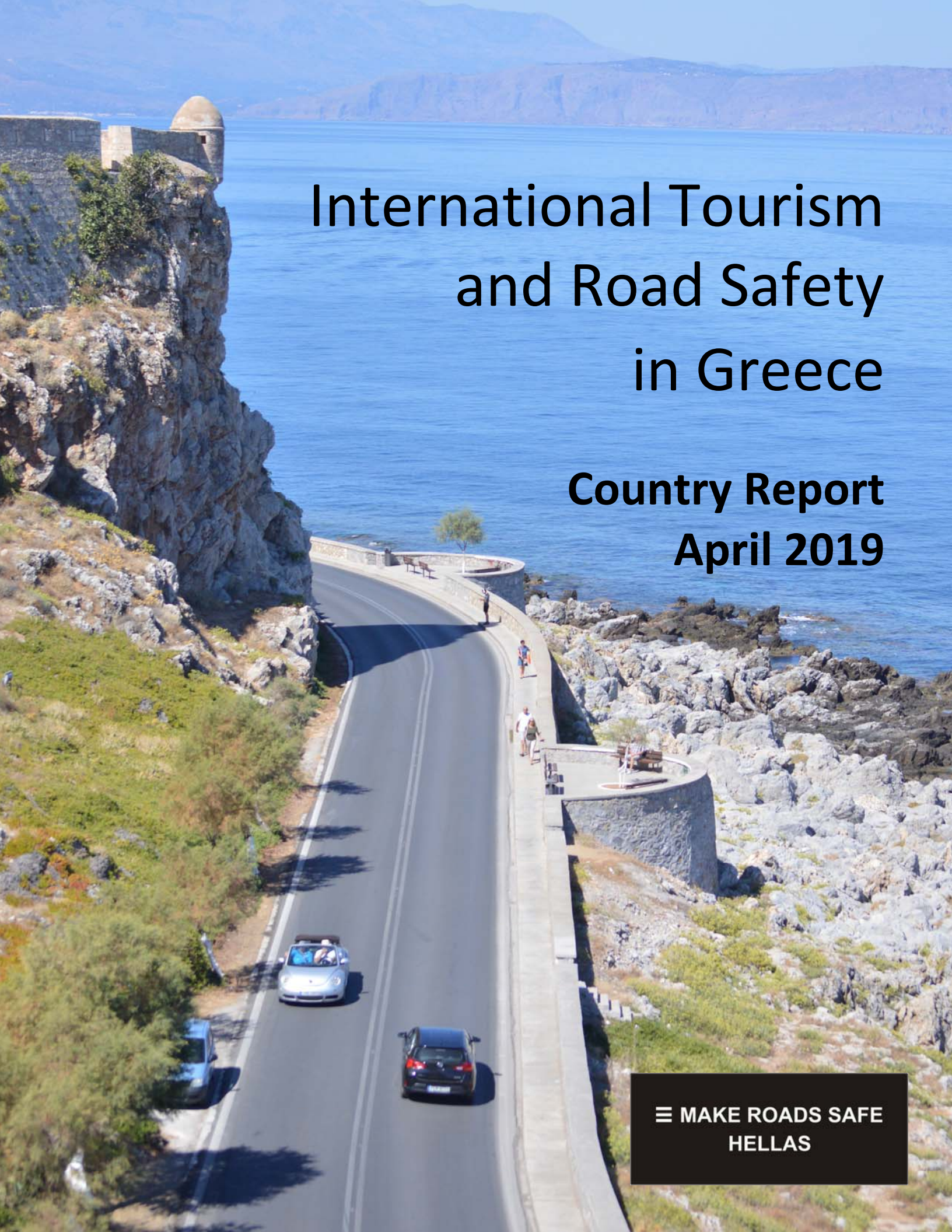


# International Tourism and Road Safety in Greece

## Country Report
## April 2019

MAKE ROADS SAFE
HELLAS

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# 1 INTRODUCTION

## 1.1 Aim and objectives

Greece has enjoyed a reputation as one of the prime tourism destinations in the world. Despite the economic crisis, the tourism industry in Greece is significantly growing. At the same time, Greece is among the worst performing countries in Europe in terms of road safety with a comparatively high annual rate of road accident fatalities.

The road safety problem in popular touristic destinations affecting both visitors and residents has not been properly addressed. Data related to tourists' road fatalities and injuries are not systematically maintained, tourists are not well and officially informed before and during their travel about the country-specific road safety issues (e.g. roads condition, traffic code, driving culture), while stakeholders in the tourism sector do not have a good understanding of the ways they can contribute.

The current country report aims to take the first step towards the identification of the importance of road safety for tourists and tourism development in Greece, to raise awareness, influence road safety public policy and promote active cooperation of all relevant stakeholders.

The remainder of this document is organized as follows:

In **Chapter 1** the background to the study is presented, explaining the extent of the problem globally and the necessity for the tourism sector to consider tourists' road safety as an integral element of sustainable and responsible tourism development.

**Chapter 2** presents a comprehensive review of basic data and information regarding international tourism and road safety in Greece. More specifically:

- It presents the position and role of Greece in the global tourism market and describes the basic country-specific characteristics of international tourism. It also indicates the vital role of the tourism sector for the national economy and explains the reasons that improvements in road safety could strengthen the tourism sector's competitiveness.
- It summarizes basic road safety statistics for Greece, allowing – among others - for a comparison with other EU countries and countries competing in tourism.

- It presents an analysis of tourists-specific road safety statistics and important conclusions regarding the estimated exposure of international tourists to road accident risks.
- It presents the road safety status of the main national road network serving tourists' mobility in the country, based on recent wide-range road safety assessments according to the iRAP international protocols.

**Chapter 3** presents the results of an important national survey on tourists' road safety that was implemented in 2018 by four Greek universities. The survey captured almost 1,500 international tourists' perceptions and experiences on road safety and mobility in Greece and investigated the extent to which these perceptions affect the ultimate value of their overall travel experience in the country.

Finally, in **Chapter 4** a set of policy and industry-wide recommendations is discussed as a basis for consultation with the stakeholders of the tourism sector in order to enhance safe and accessible tourism in Greece.

## 1.2 Background

Global research indicates that road crashes are the second biggest cause of death and injury for tourists and business travelers globally. It is evident that road traffic risks are appreciably higher than health risks such as epidemics (e.g. AIDS), illnesses (such as malaria and cholera), personal security risks associated with international terrorism, violence and crime, travel injury risks on modes other than road transport modes (e.g. aviation), and other personal injury risks. The scientific community and many international organizations forewarn that unless action is taken to address tourist road safety risks, the numbers of tourists killed and seriously injured will continue to rise sharply over the next decades. Within this framework, the FIA Foundation for the Automobile and Society published a report (White, 2010) that highlights the extent of the problem globally and provides a comprehensive set of recommendations to stakeholders of the tourism sector. The current report utilizes these ideas and demonstrates a way to implement its suggestions at a national and local level.

**International tourists' versus residents' road traffic risks**

It is now widely accepted that international visitors face higher risks on the roads in destination countries than the risks faced by residents.

The overall risks to which tourists are exposed will depend to a considerable extent on the local road safety environment, driving conditions and level of enforcement – and in particular the safety of infrastructure and vehicles, extent of speeding, driving while under the influence of alcohol or drugs, etc. Thus, tourists, as well as residents, face higher risks in countries with higher fatality rates on their roads.

At the same time tourists have to deal with a number of additional risk-contributing factors, such as poor knowledge of the road network, lack of understanding of local traffic rules and signs, insufficient driving skills under unknown conditions, disorientation, distraction and fatigue that increase the probability of involvement in road accidents. It is evident that tourists are more at risk when they are not well prepared, where there is insufficient harmonization in road safety practices (e.g.: pedestrian priority at pedestrian crossings) or they are involved in risky behaviour (e.g.: speeding, drink-driving and not wearing a seat-belt or crash helmet).

**Preparedness against road traffic risks**

People travelling overseas appear concerned about certain issues such as health, aviation or personal security risks. They appear relatively unconcerned about road safety in destination countries, while their acquisition of relevant information is mainly performed through unofficial and possibly unreliable sources (e.g. forums, travelers personal experiences).

Surprisingly, many organizations providing advice on travel risks abroad still focus on other better understood but lower level risks to health, such as infectious diseases and personal security. Although international organizations (e.g. WHO) and a limited number of national authorities highlight road fatality and injury risks for tourists, a wide-scale initiative for promoting international tourists' road safety is still missing. Equally of concern is that the tourism industry, including institutional organisations and businesses (e.g. hotels, rental car companies, tourist agencies and operators), generally do not provide any advice to prospective tourists to forewarn them of the road safety risks. Beyond general warnings there is rarely any detailed or country specific road safety information reaching tourists. With some exceptions, it

appears that the tourism sector, especially at national or local level, systematically overlooks these risks and the importance of tourists' road safety towards a sustainable tourism development model.

### 1.3 Safe mobility: a key issue for sustainable tourism development

The United Nations and the World Tourism Organization, as well as other international organisations, have well recognized the high potential contribution of the travel and tourism sector to the achievement of the 2015–2030 Sustainable Development Goals (SDGs). Goals 8 and 12 of the SDGs call upon countries to "devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture." Within this framework, *"making better places for people to live in and better places for people to visit"* is actively promoted as the next challenge for all tourism stakeholders, both institutional and businesses.

In this context, ensuring safe mobility is a prerequisite (conditio sine qua non) for the success of tourism not only at global but also at national and local level and directly contributes to the UN SDG 3 – Good health and wellbeing and SDG 11 – Sustainable cities and communities.







Both tourists and residents should be able to benefit from the rapid growth of the tourism sector without compromising their safety on the roads. This requires that all tourism stakeholders (governments, local authorities and tourism industry) take responsibility and actions to reduce road fatalities and injuries.

# 2 INTERNATIONAL TOURISM AND ROAD SAFETY IN GREECE: FACTS AND FIGURES

## 2.1 International tourism in Greece

### 2.1.1 Greece as a tourism destination: from Xenius Zeus to modern times

With more than 16,000 kilometers of coastline, more than 6,000 islands and islets, rich cultural heritage and natural beauty, excellent weather conditions and a well-established tourism industry, Greece has enjoyed a reputation as one of the prime tourist destinations in the world.

The country has a long tradition in tourism and hospitality and stimulated travel activity since the beginning of recorded history. Already in ancient times, foreigners were considered as "sacred" and Xenius Zeus, the King of the Olympians, also became the God of hospitality to protect foreigners and inspire locals to take care of their visitors. In modern times, the scientific documentation of tourism in Greece commenced after the Second World War, while major tourism development started in the mid-1970s. A dramatic increase of tourism flows to Greece was experienced in the late 1970s and 1980s and triggered the large expansion of tourism, especially in islands and areas of historical interest (Buhalis, 2001); (Guduraš, 2014).



**Photo 1:** Philoxenia - the ancient roots of Greek hospitality

During recent years, Greece has been recovering from the economic crisis and records an important increase of international tourists' arrivals. As depicted in **Figure 1**, the country is now among the top-10 global powers in international tourist arrivals, according to the annual report released by the Organization for Economic Co-operation and Development (OECD, 2018).

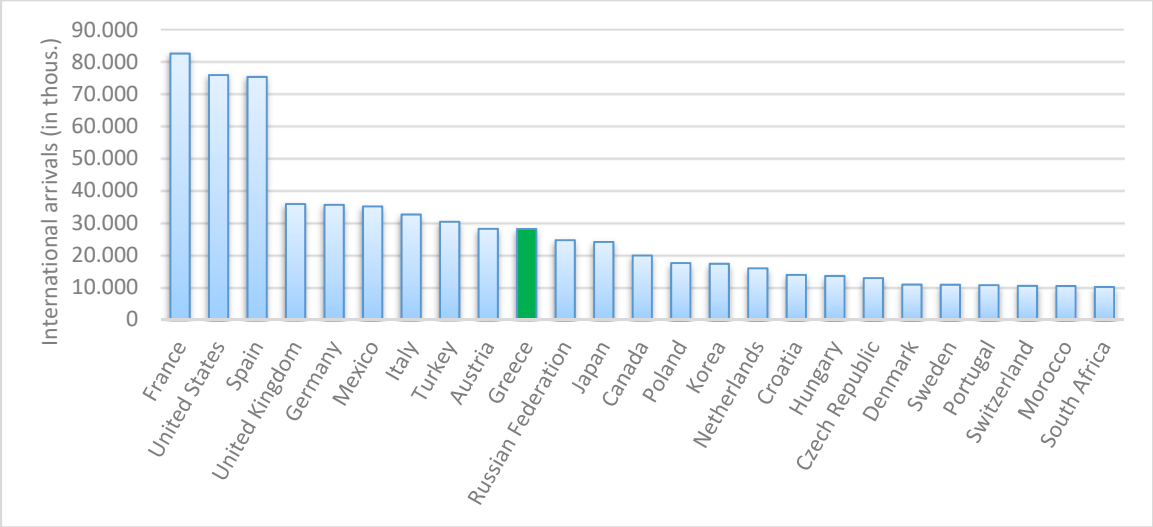



**Figure 1:** International tourists' arrivals in OECD countries (top 25) *(Source: OECD)*

Remarkably, the comparison of international tourists' volumes with the local population, gives Greece the third position globally (**Figure 2**).

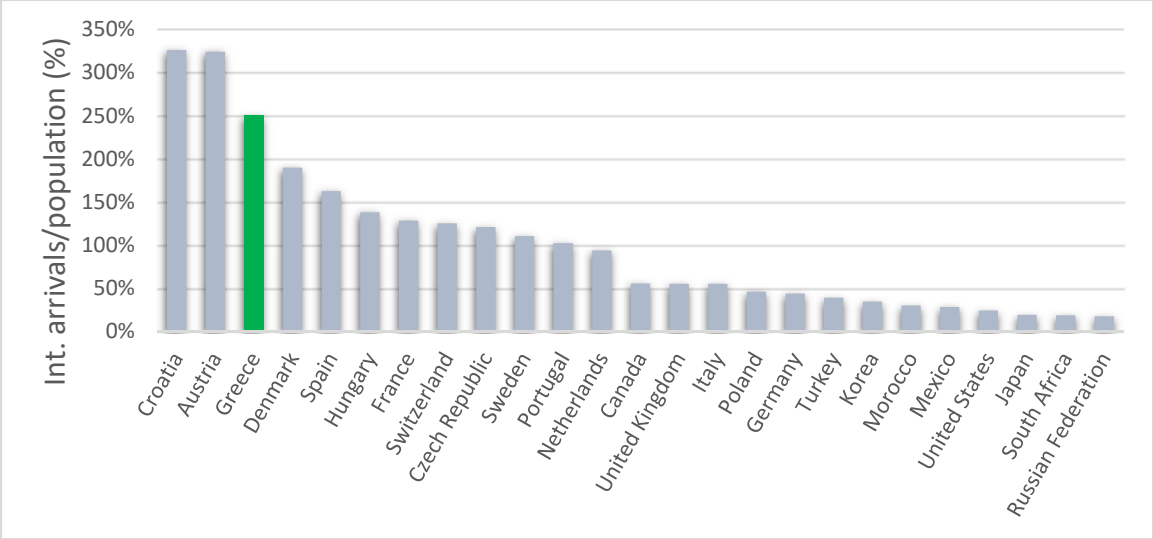



**Figure 2:** International tourists' arrivals compared with local population in OECD countries (top 25)

The Greek Tourism Confederation (SETE) reports that in 2017 the country received a record number of international tourist arrivals for the fourth consecutive year, totaling 27,2 million visitors (not including cruise data), while the estimation for 2018 is calculated at 32 million, almost 3 times the country's population. The country attracts visitors mainly from Europe and

especially from EU countries, while the top 5 countries of origin are Germany, the UK, France, Italy and Romania (SETE Intelligence, 2018).

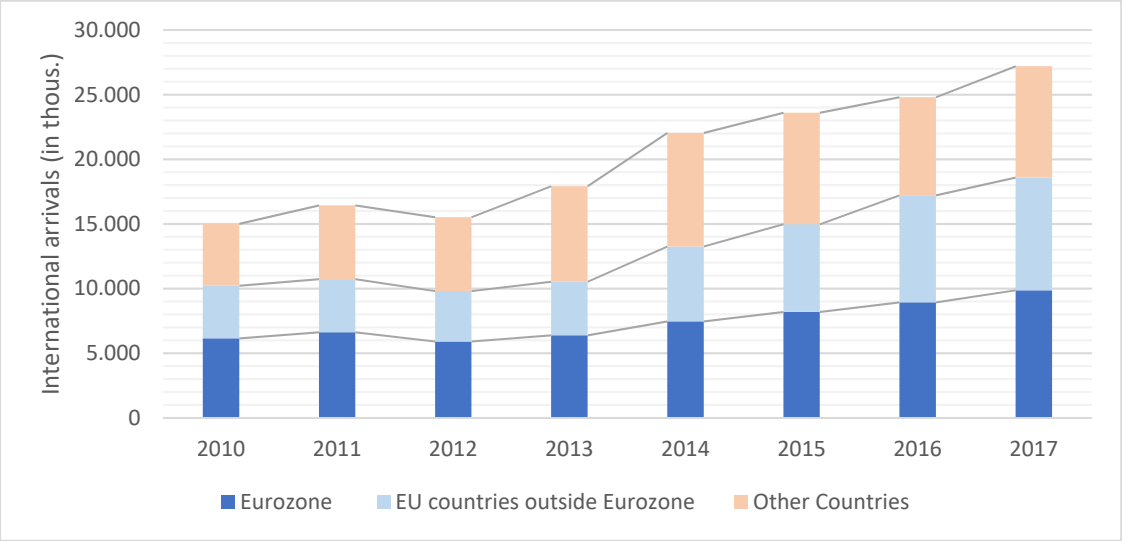



**Figure 3:** Evolution of international tourists' arrivals (*Data source: Bank of Greece – Frontier Survey*)

### 2.1.2 Characteristics of international tourism in Greece

International tourism in Greece is highly affected by seasonality, as the vast majority of tourists (81%) visit the country during the summer period (April-September) for Sun & Sea holidays. Similarly, 86% of tourism revenues are recorded in this period, as shown in **Figure 4**Error! Reference source not found..

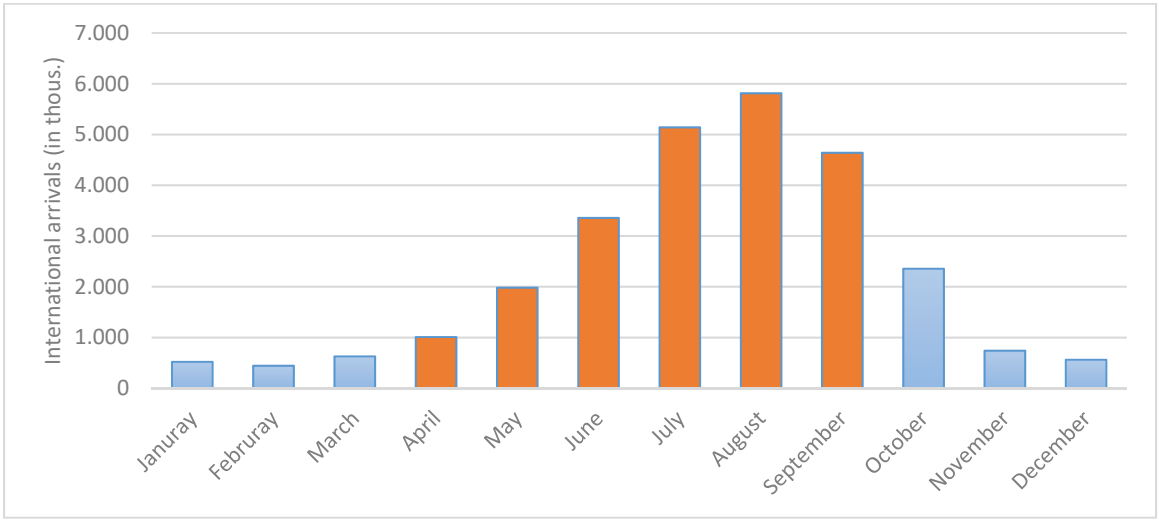



**Figure 4:** Monthly distribution of international arrivals (2017)

Although most travelers arrive in Greece by air (66% in 2017), the number of those traveling by road, coming mainly from the Balkans, increased proportionally in the last years, as depicted in the following **Figure 5** .

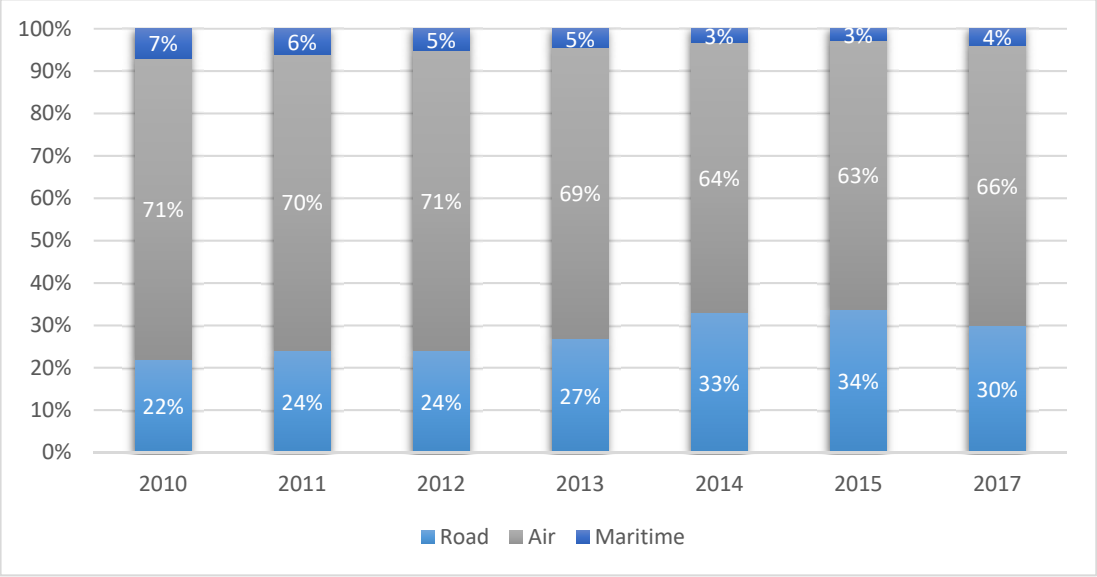



**Figure 5:** International arrivals by mean of transport (in % of total)

The Regions with the largest incoming passenger traffic are Central Macedonia, the South Aegean, Attica, Crete and the Ionian Islands, as presented in the next **Figure 7** and **Figure 7** (SETE Intelligence, 2018). As far as the country of origin is concerned, the German market has an impressive presence in almost all Regions, followed by the British market, which has a presence in most of the Regions. Especially in Crete, these two markets represent the 42% of the total visitors.

| Region | Visits | Overnight Stays | Region | Visits | Overnight Stays |
|---|---|---|---|---|---|
| Southern Aegean | 19% | 22% | Thessaly | 2% | 2% |
| Central Macedonia | 23% | 19% | Epirus | 2% | 2% |
| Crete | 15% | 19% | Northern Aegean | 1% | 2% |
| Attica | 17% | 14% | Western Greece | 2% | 1% |
| Ionian Islands | 10% | 12% | Central Greece | 1% | 1% |
| Eastern Macedonia & Thrace | 4% | 3% | Western Macedonia | 1% | 0% |
| Peloponnese | 2% | 2% | | | |



**Figure 6**: Distribution (%) of visits and overnight stays per Region *(Source: Bank of Greece, processing SETE Int.)*




**Figure 7**: Distribution of visits stays per Region - Map *(Source: Bank of Greece, processing SETE Int.)*

### 2.1.3 The importance of tourism for Greece

The OECD (2018) recognizes tourism as a central pillar of the Greek economy and an important factor in country's GDP and employment. In recent years, tourism has served to shore up the Greek economy against the recession and functioned as a powerhouse to reduce unemployment. According to the World Travel & Tourism Council (2018), inbound tourism in 2017 contributed directly to GDP with a record of EUR 14,3 billion (8% of GDP), which accounts for a 11.4% increase compared to 2016. This value primarily reflects the economic activity generated by industries such as hotels, travel agents, airlines and other passenger

transportation services but also includes the activities of restaurants and leisure industries directly supported by tourists. The total contribution of tourism to GDP (considering wider effects, such as tourism marketing and promotion, security services, domestic purchasing of goods and services by sectors dealing directly with tourists, etc.) was EUR 35 billion in 2017 (19.7% of GDP) and it is expected to grow to EUR 36,9 billion in 2018 (20.2% of GDP). It is forecasted to rise by 3,7% to EUR 52,8 billion in 2028 (22.7% of GDP).

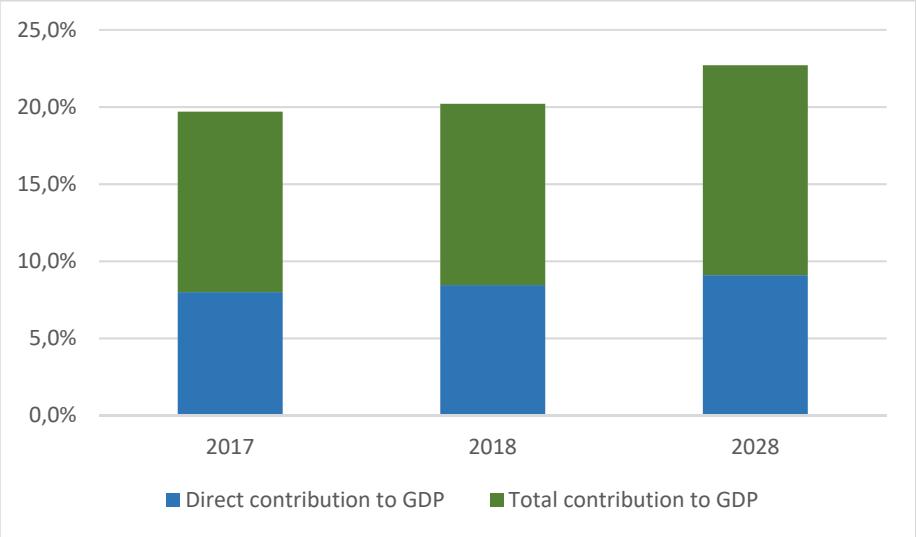



**Figure 8:** Contribution of inbound tourism to GDP (direct and total) *(Source: World Travel & Tourism Council)*

The positive outlook of the tourism sector attracts the attention of investors and, as a result, it functions as a key driver of growth in Greece. According to the World Travel & Tourism Council (2018), capital investments in tourism reached in 2017 the EUR 3,1 billion and are expected to rise by 5,5 % over the next ten years. **Figure 9** below presents the evolution of Travel & Tourism investments, as a proportion of total national investments.

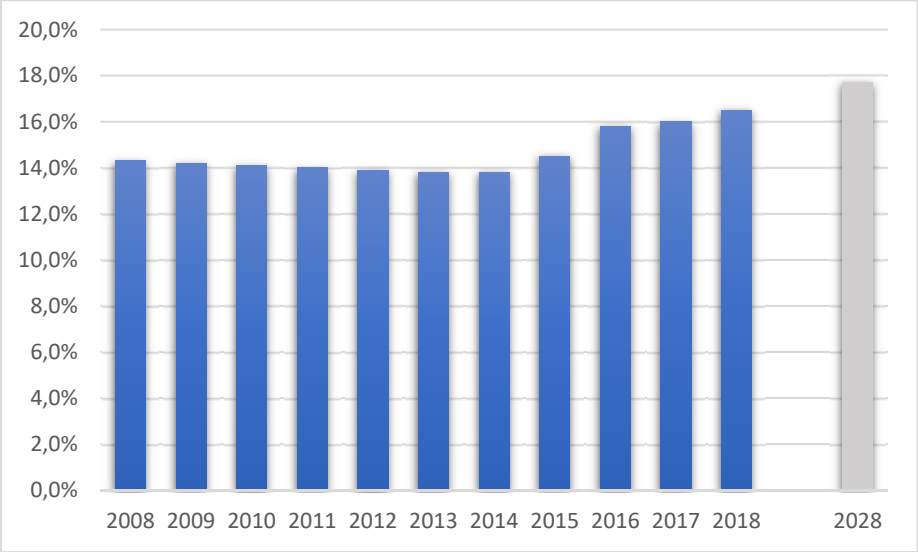



**Figure 9:** Evolution of Travel & Tourism's investments: share of total national investments (*Source: World Travel & Tourism Council)*

### 2.1.4 Tourism sector competitiveness and points of attention

According to the World Economic Forum (WEF) (2017), Greek tourism competitiveness in 2017 made an impressive climb of 7 places to reach the 24th position in the global rankings (of 136 countries) and the 14$^{th}$ in the European ones. However, further enhancement of the sector's competitiveness is possible through a variety of strategies that include **improvement of the country's safety/security performance and of its ground and port infrastructure to support safe, efficient, convenient and economical movement of people and goods**. A detailed analysis of the main road network serving tourists movement in Greece is presented in **§0** of this report, while the findings of a national survey that investigated international tourists' perception about road safety and mobility in Greece is presented in **Chapter 3**. Road safety improvements can undoubtedly help the country to further strengthen its profile on the regional (i.e. Southern Europe) and global tourism market.

On the other hand, the rapid growth and the positive forecast for the next ten years have raised discussions about the possibility of an "over-tourism" crisis, as a result of strained infrastructure and overcrowding in big cities and at major attractions. Similar crises have been reported in popular tourist destinations including Barcelona, Venice, Amsterdam, Dubrovnik, Madrid, Mallorca and Kyoto, where over-tourism has triggered tension between locals and visitors, social reactions and political decisions to limit inbound tourism. As examples, in January

2017 Barcelona voted for a new law that limits the construction of hotels and stops licenses being issued to new tourist accommodation rentals, in 2017 Mallorca and Botswana introduced high tourism taxes, while in 2018 Philippines Island and Maya Bay in Thailand closed to tourists for six months in an attempt to overhaul local infrastructure.

In Greece, the National Tourism Organisation (GNTO) recognizes the potential for problems and reports that the national policy *"dictates not moving beyond the carrying capacity of the environment"*. Some of the most popular islands (Santorini, Mykonos, Naxos, Crete) were already faced this year with important traffic problems and unavailability of parking spaces, as the existing infrastructure could not withstand the growing demand. Problems also increased at large ports such as Piraeus and Rafina, as well as at smaller islands ports which were unable to bear the levels of traffic and the resultant pollution.

Based on the above, it is evident that tourism is an important sector for Greece which is growing fast, but it is more than crucial that the development is done in a way that generates sustainable health and wellbeing, financial, environmental and social benefits. Development within the Responsible Tourism framework for *"making better places for people to live in and better places for people to visit"* should be the next challenge for the country. This requires that all tourism stakeholders take responsibility and action to make tourism more sustainable. In this context, safer mobility and accessibility is considered to be a key element not only for improving the country's competitiveness in the global market but also for fostering the ancient value of *"philoxenia (φιλοξενία)" – caring hospitality* - and inspiring a new era of people-centered tourism development.

## 2.2 Road safety in Greece

### 2.2.1 Road safety statistics

In Greece, in the second half of the last century, the number of road accidents and casualties continuously increased until the mid-90s, as a result of the large increase in the number of vehicles, unconstrained traffic management, the shortage of infrastructure and lack of responsible driving behavior. Since 1996, the annual number of road fatalities (2,500) began to decline and stabilized at the level of 1,600 fatalities until 2007 (Yannis & Laiou, 2014). During the last decade, a significant decrease of almost 50% has been recorded down to 826 fatalities in 2016, towards the target of less than 640 fatalities set by the current National Strategic Plan for Road Safety (2011 – 2020) (National Technical University of Athens, 2011). The current road fatality rate (deaths/100.000 inhabitants) in the country has similarly dropped by 48% from 14.6 in 2007 to 7.6 in 2016, as depicted in **Figure 10.** Moreover, the total number of road accidents reduced by 27% (from 15,499 to 11,318) and serious injuries by 52% (from 1,821 to 879), for the same period (Hellenic Statistical Authority, 2018).

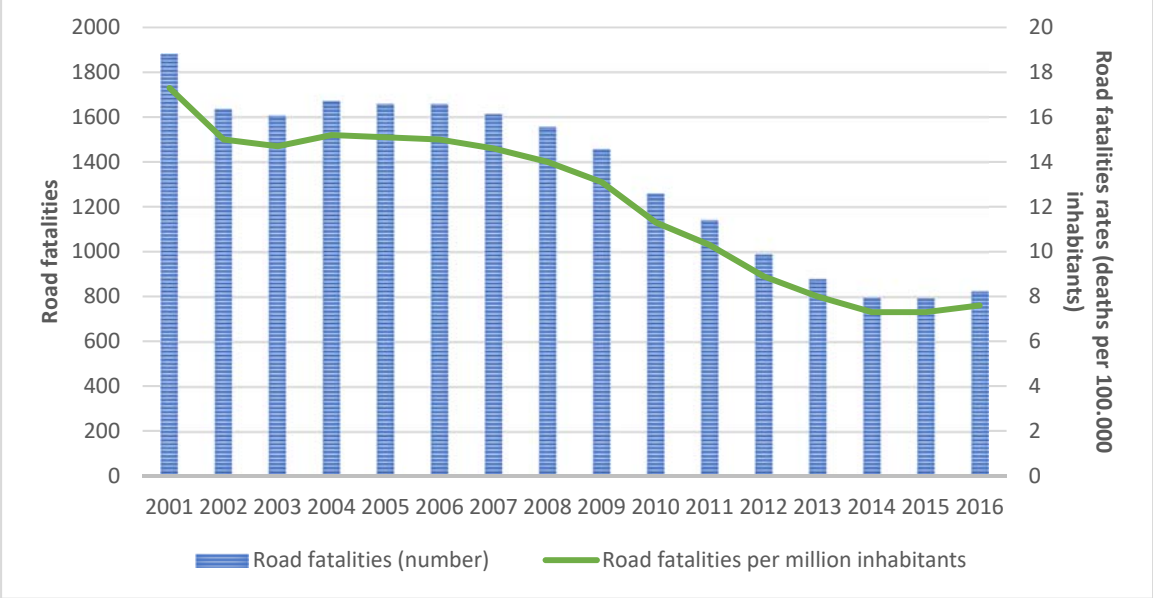



**Figure 10:** Evolution of road fatalities and road fatalities rates in Greece 2001-2016 (*Data source: Eurostat)*

This impressive decrease in road accident fatalities during the last decade and especially from 2009 has been explained by many researchers and practitioners as a result of the economic recession, which affected travel patterns, reduced private car journeys and led to an

important decrease in the total number of Vehicle Kilometers Traveled. Moreover, the upgrade of the main highway network, the improvement in vehicle safety technologies, the National Traffic Code reform (in 2007), the improvement of enforcement, the adoption of better driving practices by drivers, and efforts on driver training (Mpogas, Kopelias, Mitropoulos, & Kepaptsoglou, 2017) also contributed to the reduction of road accidents.

#### *2.2.1.1 Greece among the EU28 countries*

The comparison with the other EU28 countries indicates that Greece's achievement in reducing road fatalities is remarkably above the EU average, but far enough from the top-5 group of Lithuania, Estonia, Latvia, Slovakia and Spain.

Moreover, the previously described improvements have not yet proved able to change the position of Greece among the other EU28 countries. Greece continues to be among the worst performers in the EU28, in terms of road fatality rates, as depicted in the following **Figure 11**. It is estimated that the financial and social cost of road fatalities, injuries and material losses due to recorded road accidents in Greece is over 3 billion euro per year. This may even be tripled if non-recorded road accidents are taken into account.

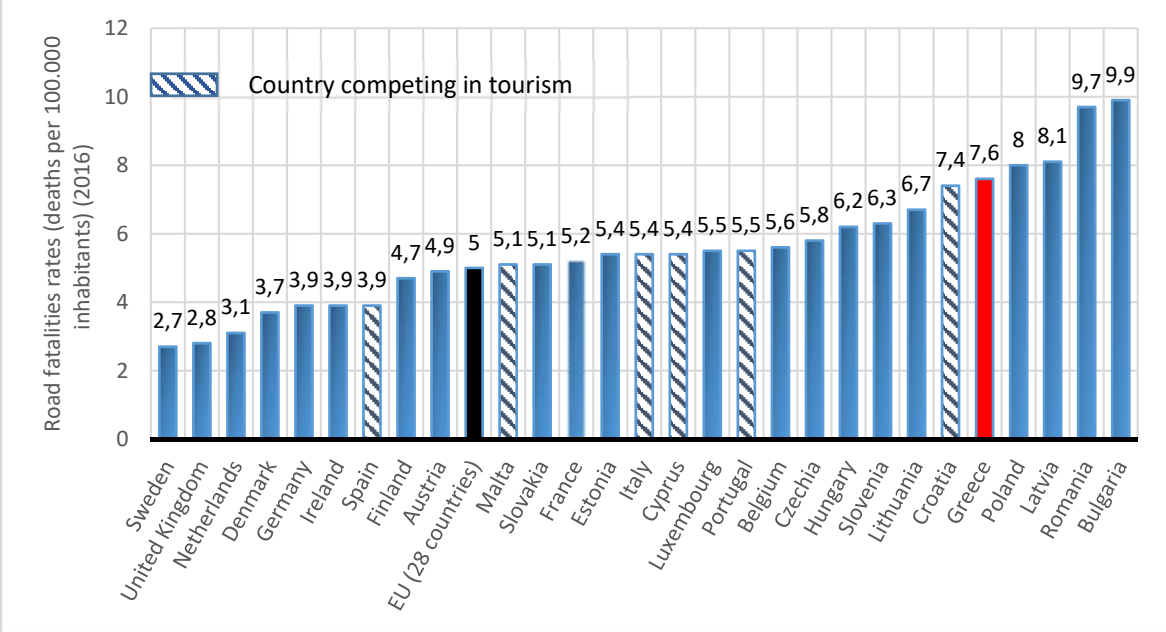



**Figure 11:** Road fatalities rates (deaths/million habitants) per country in EU28 2016 (Data source: Eurostat)

It should also be noticed that Greece's road safety performance is worse than other Mediterranean countries competing in tourism, such as Spain, Malta, Italy, Cyprus, Portugal and Croatia.

*2.2.1.2 Characteristics of road fatalities*

According to the most recent annual report on road accidents for 2016, published by the Hellenic Statistical Authority (2018), some basic remarks on the fatal accident statistics are presented below:

- Out of the total number of fatalities, drivers account for 66.5%, passengers for 15.4% and pedestrians for 18.1%.
- Male drivers constitute a high-risk group, accounting for 61.7% of deaths.
- Drivers (males and females) aged 25 – 49 years account for 29.1% of total number of deaths.
- Drivers (males and females) of two-wheeled vehicles (motorcyclists and bicyclists) account for 31,5% of deaths.
- As regards the distribution of fatalities by type of area where the accident occurred, it is observed that 51.8% of fatalities were reported in urban areas, 42.7% in rural areas and only 5.5% in motorways.
- In residential areas, 25.8% of persons killed were in passenger cars, 43.8% on two-wheel vehicles and 28.3% were pedestrians.

It must be noted that the road fatality rate for motorcyclists in Greece is the highest among the EU28 counties (**Figure 12**). This remark is of great importance if correlated with the fact that motorcycles and bicycles are the most popular means of transport for international tourists, especially in touristic islands.

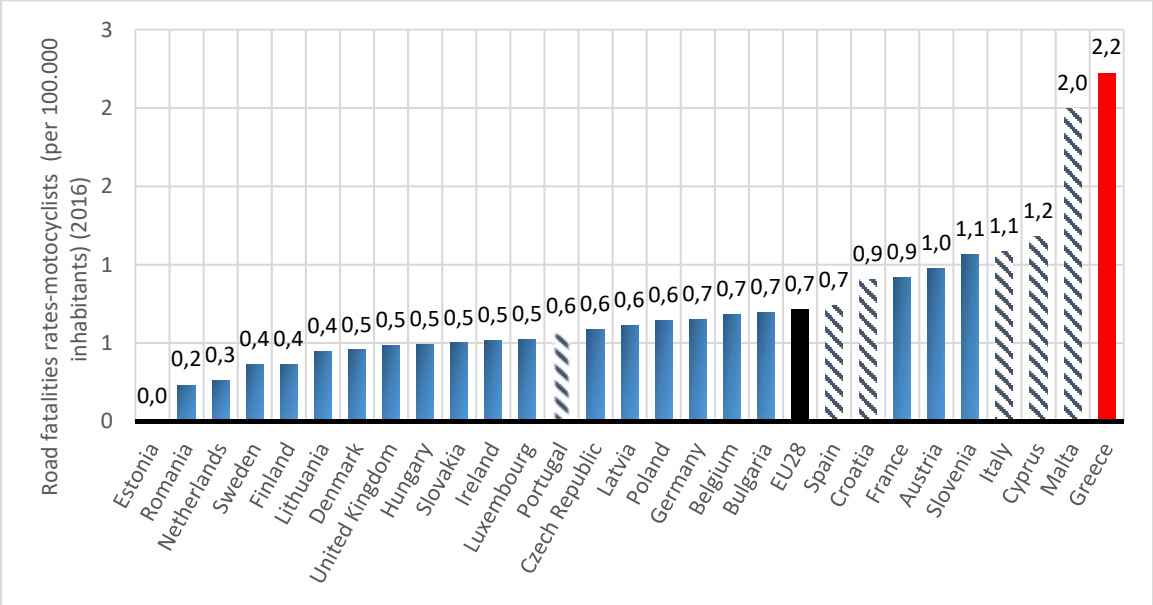



**Figure 12**: Road fatalities involving motorcycles (deaths/100.000 habitants) per country in EU28 2016 (Data source: Eurostat)

**Road accidents and fatalities by Region**

In 2016, road accidents per 100,000 inhabitants in Greece amounted to 105. The region of Attica is on the top of the list with 149 accidents, followed by Central Makedonia with 130 accidents and Peloponnese with 97.1 accidents.

The number of fatalities per 100,000 inhabitants in Greece amounted to 7.6. The region of **South Aegean** is on the top of the list with 13.4 persons killed, followed by **Peloponnese** with 12.4 and **Central Greece** with 11.2 persons killed. **Crete** (10.0 persons) and **Ionian Islands** (8.7 persons) regions also record higher fatality rates compared with the national average. **Figure 13** below presents the regional accident and road fatality rates in a combined view with the intensity of international tourism (see also **2.1.2**, **Figure 7**).




**Figure 13:** Regional accidents and road fatalities rates in a combined view with the international tourism intensity 2016 (*Data source: Hellenic Statistical Authority, Bank of Greece)*

It is observed that the **popular island touristic destinations of South Aegean and Crete** record high fatality rates, while mainland touristic areas such as **Central Macedonia** and **Attica** record high accidents but lower fatality rates.

### 2.2.2 Tourism and road accidents in Greece[1]

A more detailed analysis of the road accident statistics published by the Hellenic Statistical Authority revealed several interesting findings concerning the relationship between tourism and road accidents in Greece for the period 2011-2015.

The distribution of road accident casualties (killed or injured persons) by month in both touristic and non-touristic regions is shown in **Figure 14**.

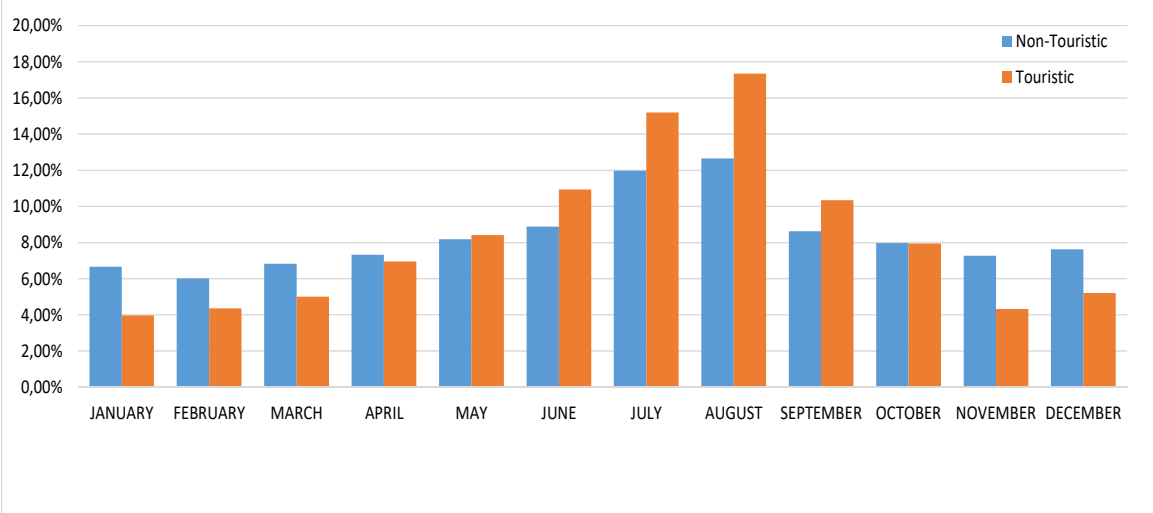



**Figure 14:** Distribution of road accident casualties by month in touristic and non-touristic regions in Greece, 2011-2015 *(Source: ELSTAT, Data processing: NTUA)*

It is noted that in all regions but more intensively in the touristic ones, the proportion of the killed or injured persons is higher during the summer period. More specifically, road casualties in touristic regions in August are two times higher than the average in these regions. Indicatively, the distribution of casualties in four touristic and two non-touristic regions is presented in **Figure 15** and **Figure 16**.

[1] George Yannis, Dimitris Nikolaou, Katerina Folla, National Technical University of Athens

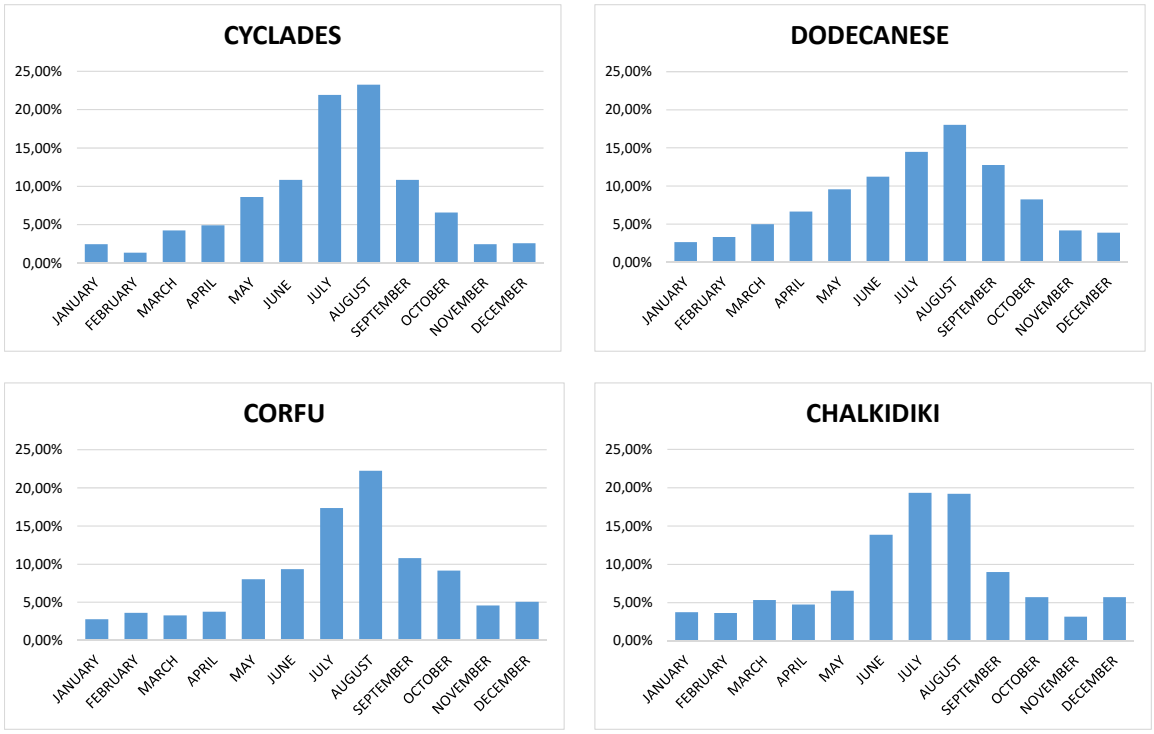



**Figure 15:** Distribution of road accident casualties by month in four touristic regions in Greece, 2011-2015 *(Source: ELSTAT, Data processing: NTUA)*

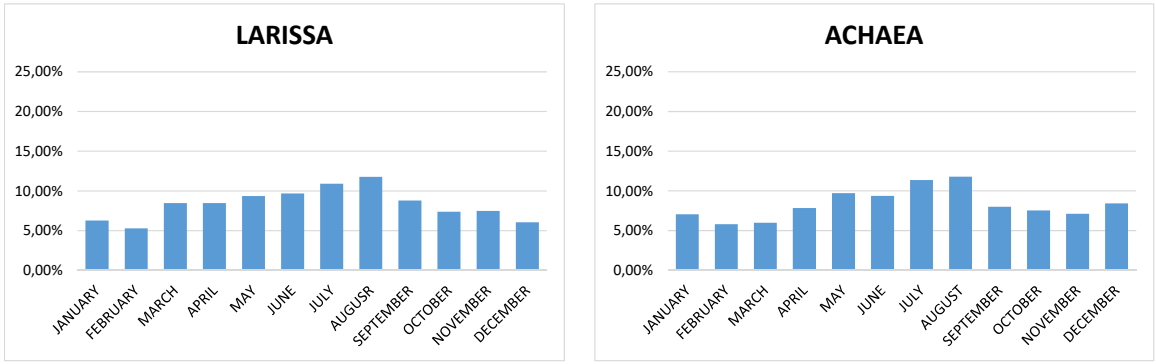



**Figure 16:** Distribution of road accident casualties by month in two non-touristic regions in Greece, 2011-2015 *(Source: ELSTAT, Data processing: NTUA)*

It is observed that in most touristic regions, the number of road casualties increases during the spring, peaks in August and then decreases in September, following the seasonality pattern observed for the tourists flows (see §**2.1.2** above). On the contrary, this pattern is not observed in non-touristic regions, where the distribution of the road accident casualties presents a quite smoother fluctuation.

The following **Figure 17** presents the distribution of the road casualties (killed or injured) by gender in touristic and non-touristic regions. The results indicate that there is no significant difference of the gender shares between the two types of regions.

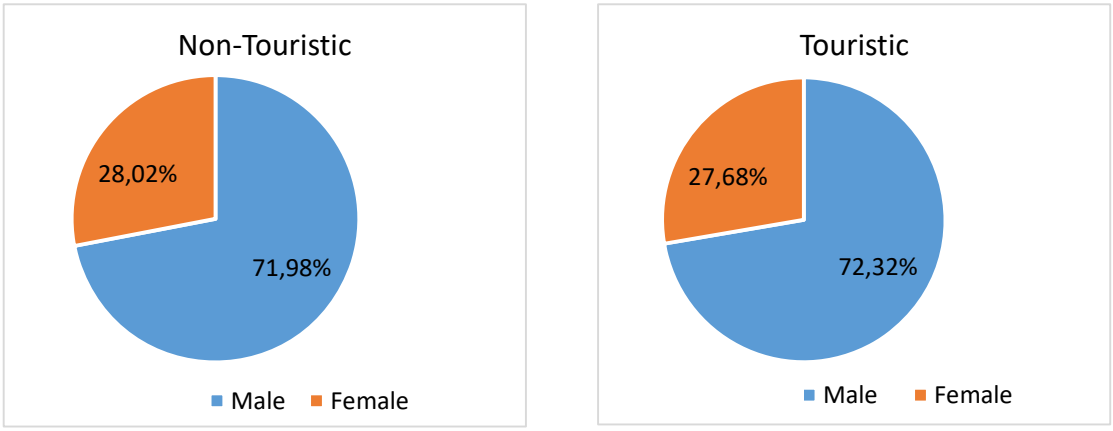



**Figure 17:** Distribution of road accident casualties by gender in touristic and non-touristic regions in Greece, 2011-2015 *(Source: ELSTAT, Data processing: NTUA)*

The distribution of road accident casualties by age group in touristic and non-touristic regions is shown in **Figure 18**.

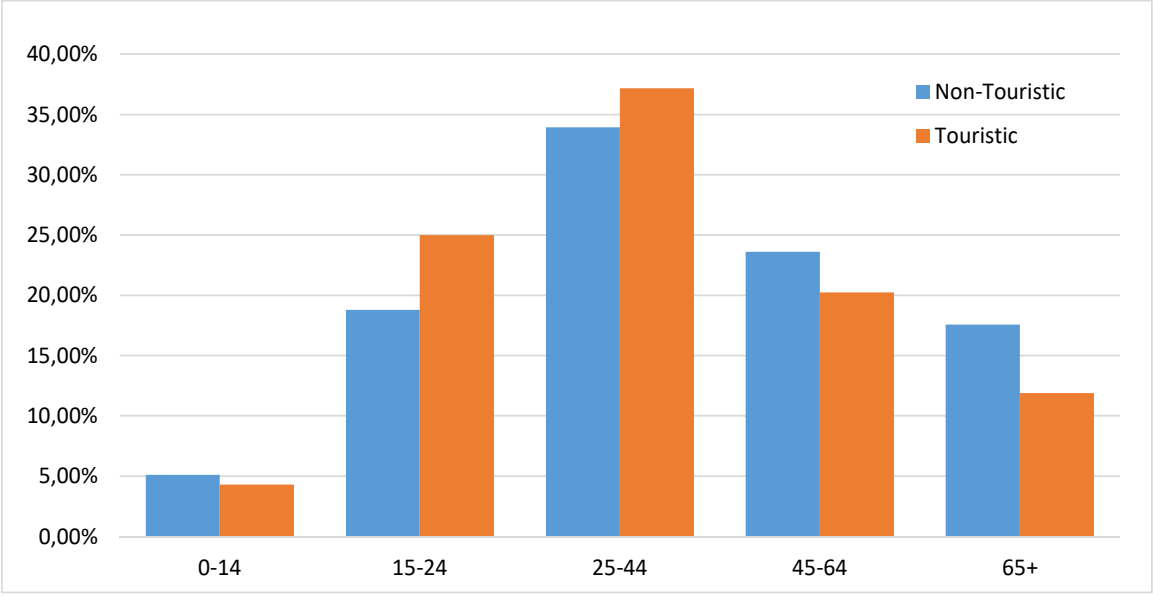



**Figure 18:** Distribution of road accident casualties by age group in touristic and non-touristic regions in Greece, 2011-2015 *(Source: ELSTAT, Data processing: NTUA)*

It is noticed that in the touristic regions the proportion of killed or injured road users at the age of 15-24 and 25-44 is higher compared to the non-touristic ones. On the contrary, in the non-touristic regions the proportion of killed or injured road users at the age of 45-64 and 65+ is

higher than the respective in the touristic ones. This is possibly explained due to the increased traffic of younger people in touristic periods and regions.

The following **Figure 19** presents the distribution of road casualties by transport mode in touristic and non-touristic regions.

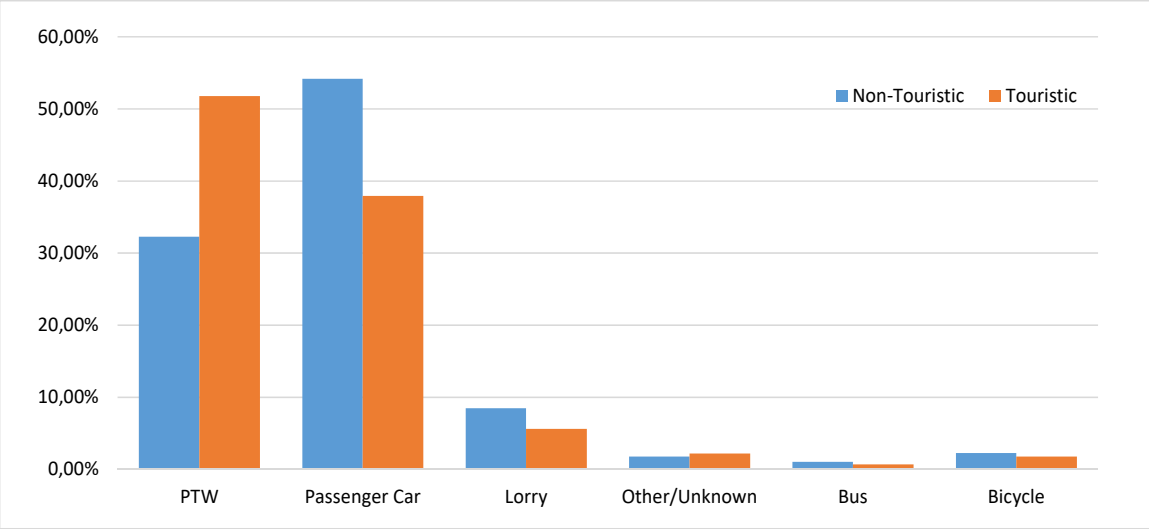



**Figure 19:** Distribution of road accident casualties by transport mode in touristic and non-touristic regions in Greece, 2011-2015 *(Source: ELSTAT, Data processing: NTUA)*

It is observed that in touristic regions, the highest share of injuries is recorded for Powered Two Wheelers (PTW) (52%), while in non-touristic regions, the highest percentages of road injuries are recorded for passenger cars (54%). This may be due to the quite higher use of PTWs in touristic regions.

The analysis of road casualties by road user's nationality for the period 2011-2015 indicates that the majority of foreign tourists are killed or injured in the touristic regions (73%), while the majority of Greeks are killed or injured in the non-touristic regions (74%).

The following **Figure 20** shows the distribution of killed or injured persons by purpose of travel in touristic and non-touristic regions.

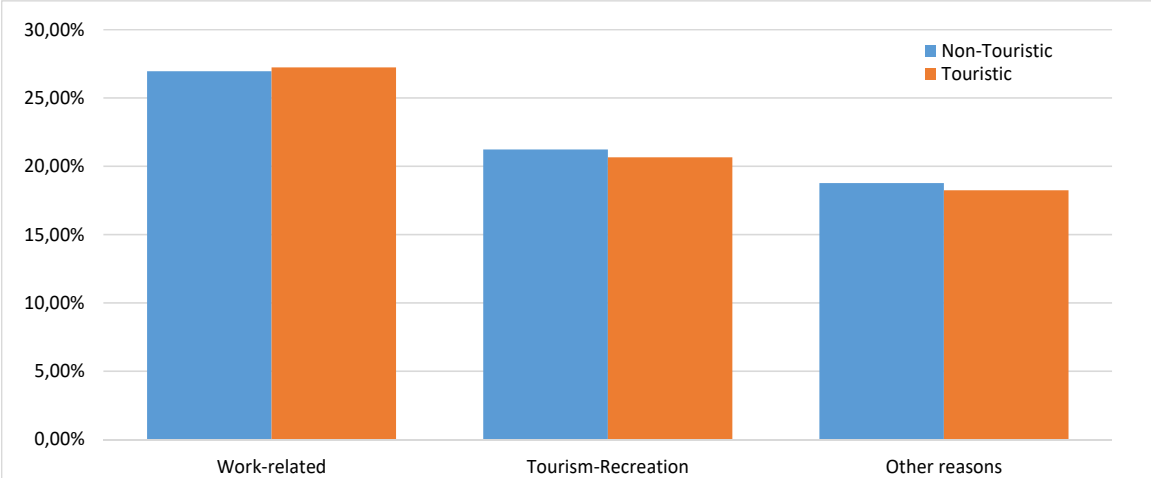



**Figure 20:** Distribution of road accident casualties by transport mode in touristic and non-touristic regions in Greece, 2011-2015 *(Source: ELSTAT, Data processing: NTUA)*

No substantial difference is observed between the two types of regions. For both touristic and non-touristic regions, work related reasons are the purpose of journey with the highest percentage, as these trips are well present all year long.

In **Figure 21**, the distribution of casualties by nationality and gender for the period 2011-2015 is presented.

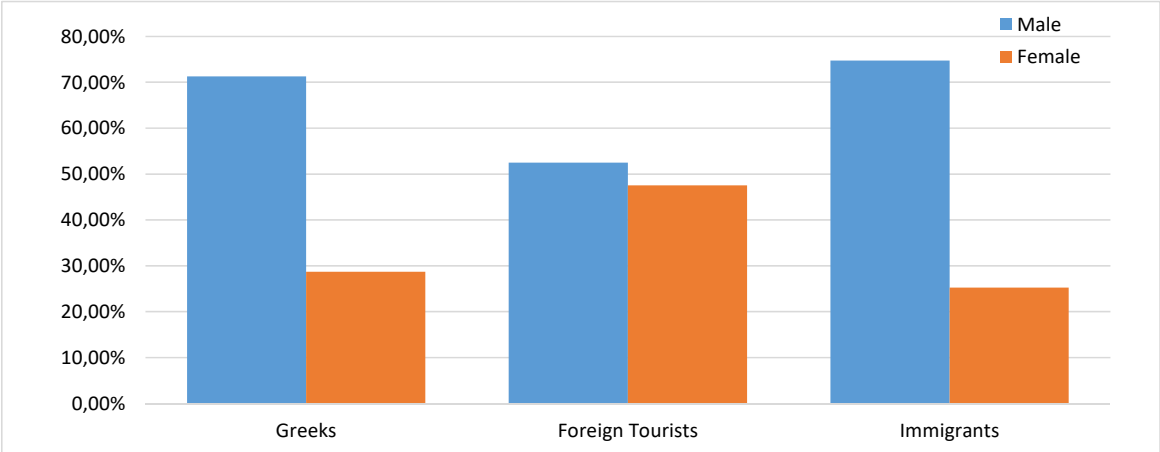



**Figure 21:** Distribution of road accident casualties by nationality and gender in Greece, 2011-2015 *(Source: ELSTAT, Data processing: NTUA)*

Among Greek killed or injured road users, males are over-represented, while among foreign tourists the percentages of male and female casualties are almost equal. The residents' higher

percentages for male casualties might be explained by the higher percentage of traffic kilometers driven by male drivers.

The following **Figure 22** presents the distribution of road accident casualties by nationality and road user type in Greece.

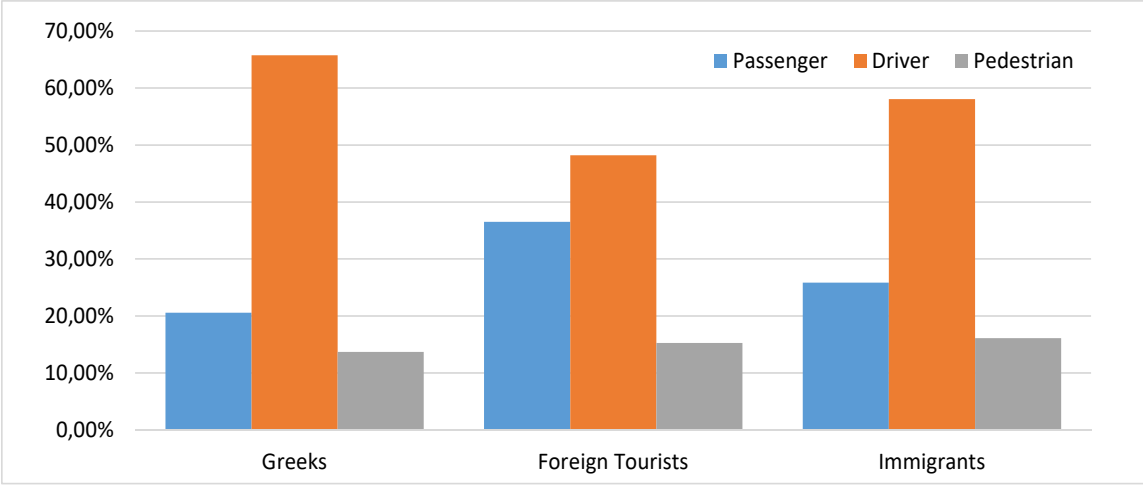



**Figure 22:** Distribution of road accident casualties by nationality and road user type in Greece, 2011-2015 *(Source: ELSTAT, Data processing: NTUA)*

Regarding the type of road user, it is noticed that for all nationalities the highest percentage of killed or injured persons concerns drivers. However, for the foreign tourists, the difference between killed or injured drivers and passengers is not that important compared to Greeks and immigrant residents, as shown in the following diagram. Perhaps it could be explained by the fact that in touristic regions the occupancy of vehicles is higher than that of vehicles in non-touristic regions.

Finally, the following tables show the number and the distribution of road fatalities and road accident injuries by nationality and period in touristic and in non-touristic regions.

**Table 1:** Number of road fatalities in touristic and in non-touristic regions by nationality and period, 2011-2015 *(Source: ELSTAT, Data processing: NTUA)*

| | Touristic Regions | | | Non-Touristic Regions | | |
|---|---|---|---|---|---|---|
| | Touristic Period | Non-Touristic Period | Total | Touristic Period | Non-Touristic Period | Total |
| Greeks | 301 | 383 | 684 | 718 | 1.054 | 1.772 |
| Foreign Tourists | 43 | 28 | 71 | 16 | 17 | 33 |
| Immigrants | 37 | 50 | 87 | 78 | 126 | 204 |
| Total | 381 | 461 | 842 | 812 | 1.197 | 2.009 |

**Table 2:** Percentage of road fatalities in touristic and in non-touristic regions by nationality and period, 2011-2015 *(Source: ELSTAT, Data processing: NTUA)*

| | Touristic Regions | | | Non-Touristic Regions | | |
|---|---|---|---|---|---|---|
| | Touristic Period | Non-Touristic Period | Total | Touristic Period | Non-Touristic Period | Total |
| Greeks | 79% | 83% | 81% | 88% | 88% | 88% |
| Foreign Tourists | 11% | 6% | 8% | 2% | 1% | 2% |
| Immigrants | 10% | 11% | 10% | 10% | 11% | 10% |
| Total | 100% | 100% | 100% | 100% | 100% | 100% |

**Table 3:** *Number of road accidents in touristic and in non-touristic regions by injured person's nationality and period, 2011-2015 (Source: ELSTAT, Data processing: NTUA)*

| | Touristic Regions | | | Non-Touristic Regions | | |
|---|---|---|---|---|---|---|
| | Touristic Period | Non-Touristic Period | Total | Touristic Period | Non-Touristic Period | Total |
| Greeks | 2.076 | 2.167 | 4.243 | 4.671 | 6.691 | 11.362 |
| Foreign Tourists | 496 | 163 | 659 | 153 | 105 | 258 |
| Immigrants | 252 | 222 | 474 | 388 | 546 | 934 |
| Total | 2.824 | 2.552 | 5.376 | 5.212 | 7.342 | 12.554 |

**Table 4:** Percentage of road accidents in touristic and in non-touristic regions by injured person's nationality and period, 2011-2015 *(Source: ELSTAT, Data processing: NTUA)*

| | Touristic Regions | | | Non-Touristic Regions | | |
|---|---|---|---|---|---|---|
| | Touristic Period | Non-Touristic Period | Total | Touristic Period | Non-Touristic Period | Total |
| Greeks | 74% | 85% | 79% | 90% | 91% | 91% |
| Foreign Tourists | 18% | 6% | 12% | 3% | 1% | 2% |
| Immigrants | 9% | 9% | 9% | 7% | 7% | 7% |
| Total | 100% | 100% | 100% | 100% | 100% | 100% |

The main conclusions extracted from the previous analysis are the following:

- An increase in road accidents and related casualties is observed during touristic periods, with the highest increase being observed in touristic regions. This fact demonstrates clearly the important impact of tourism on road safety in Greece.
- In touristic regions, the highest percentages of road accident casualties concern PTWs, while in non-touristic regions, the highest percentages of casualties are recorded for passenger cars. This might be explained by the higher PTW traffic observed in touristic regions.
- In the touristic regions there are more killed or injured persons at the age of 15-24 and 25-44 compared to the non-touristic regions, demonstrating also the increased traffic of younger people in touristic periods and regions.

- For both touristic and non-touristic regions, work related trip purposes are those with the highest percentage of road accident casualties, as these trips are well present all year long.
- Among foreign tourists the percentages of male and female casualties are almost equal, whereas for the residents' higher percentages are observed for male casualties, possibly due to more traffic kilometers driven by male drivers.
- The number of driver casualties is similar to passenger casualties for tourists, whereas for non-tourists casualties are mostly drivers, indicating a higher average vehicle occupancy among tourists.
- Foreign Tourists' road fatalities in the Touristic Period are two times higher than Foreign Tourists' road fatalities in the Non-Touristic period.
- Foreign Tourists' road injuries in the Touristic Period are three times higher than Foreign Tourists' road injuries in the Non-Touristic period.

**Accident Risk**

**Table 5** and **Table 6** below present the accident fault risk distribution as calculated by the use of the induced exposure method. The induced exposure method is based on the assumption that in every road accident in which two vehicles are involved there is one driver responsible for the accident and one innocent driver involved randomly from the total population of drivers. Consequently, the innocent driver can be considered as a sample of the total population of the drivers and reflects the exposure of any specific driver population defined on the basis of certain characteristics (Yannis, Gollias, & Papadimitriou, 2007).

The basic requirement for the use of this method is the identification of the driver who provoked the accident. Accidents in which more than one drivers are responsible are not taken into consideration. Accident risk indices are the ratio of the "guilty" drivers percentage with a certain characteristic (i.e. driver's nationality) divided by the percentage of "innocent" drivers of the same characteristic group. The relative risk, which is the ratio of the two relative accident indices, is representative of the tendency of the driver groups to provoke an accident. Ratios higher than 1 show that the relative driver group with the accident index as the nominator provokes more accidents than the other group. This method has been tested in several occasions and its statistical validity has been verified.

Consequently, the induced exposure method can be valuable in road safety analyses when relative traffic data are not available. However, it should be noted that this method concerns only drivers and not all road users, has as a prerequisite the knowledge of the “guilty” and “innocent” drivers and does not take into account all types of accidents (i.e. single-vehicle accidents).

The following tables show the results of the induced exposure method applied by taken into account driver's nationality and type of region.

**Table 5:** Accident fault risk distribution per driver nationality

| | Greeks | Foreign Tourists | Immigrants | Total |
|---|---|---|---|---|
| At-fault | 8.157 | 439 | 734 | 9.330 |
| | 87% | 5% | 8% | |
| Not at-fault | 8.167 | 352 | 702 | 9.221 |
| | 89% | 4% | 8% | |
| Accident risk | 0,99 | 1,23 | 1,03 | |
| Relative risk | 1,00 | 1,25 | 1,05 | |

As shown in **Table 5**, Greek drivers have lower fault risk than foreign tourists and immigrants; a 0,99 ratio is calculated, suggesting that in the examined category they cause fewer accidents than the ones they get caught up in. Among the three categories of drivers, Foreign Tourist drivers appear to have higher accident risk than the others.

**Table 6:** Accident fault risk distribution per driver nationality and region

| | Greeks | Foreign Tourists | Immigrants | Total |
|---|---|---|---|---|
| At-fault | | | | |
| Touristic Regions | 2.258 | 305 | 241 | 2.804 |
| | 81% | 11% | 9% | |
| Non-Touristic Regions | 5.899 | 134 | 493 | 6.526 |
| | 90% | 2% | 8% | |
| Not at-fault | | | | |
| Touristic region | 2.259 | 260 | 239 | 2.758 |
| | 82% | 9% | 9% | |
| Non-Touristic Regions | 5.908 | 92 | 463 | 6.463 |
| | 91% | 1% | 7% | |
| | | | | |
| Accident risk | Greeks | Foreign Tourists | Immigrants | |
| Touristic Regions | 0,98 | 1,15 | 0,99 | |
| Non-Touristic region | 0,99 | 1,44 | 1,05 | |
| Relative risk | Greeks | Foreign Tourists | Immigrants | |
| Touristic Regions | 1,00 | 1,17 | 1,01 | |
| Non-Touristic Regions | 1,00 | 1,46 | 1,07 | |

**Table 6** shows that accident fault risk for Greek drivers remains lower both in Touristic and Non-Touristic Regions compared to the other nationality categories. It is interesting to note that there is no significant difference between Greeks and Immigrants mainly in Touristic Regions. On the contrary, a significance difference in driver fault risk between Touristic and Non-Touristic Regions can be identified for Foreign Tourists.

## 2.3 Road infrastructure in Greece

### 2.3.1 Road network serving tourists mobility

Tourists' mobility in Greece is served by a dense rural road network of approx. 48.500 km, either National or Regional roads. The main incoming traffic to mainland (a) from/to Athens and Thessaloniki international airports, (b) from/to Albania, North Macedonia, Bulgaria and Turkey road border crossings, and (c) from/to the ports of Piraeus, Patras and Igoumenitsa is served by approx. 2.100km of motorways that have been recently constructed or upgraded, conforming to high quality standards (**Figure 23**).

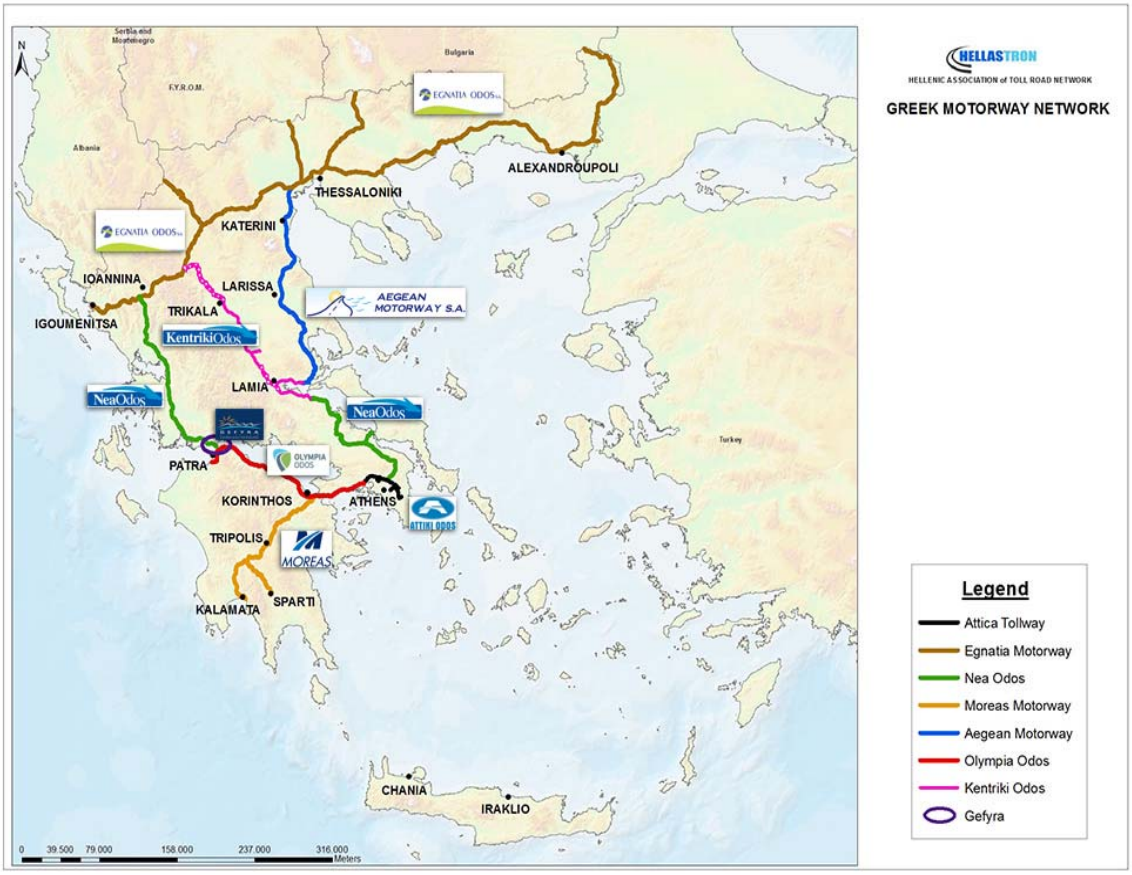



**Figure 23:** Greek Motorway Network *(Source: HELLASTRON)*



**Figure 24:** Greek Motorway Network – indicative photos

Transport in touristic areas of mainland Greece is served by the rest of the national (i.e. excluding motorways), regional and municipal road network. The national roads are single carriageway or limited-access roads with one or two traffic lanes for each direction, usually with an emergency or multi-purpose lane on each side. These roads connect major cities and provide access to popular touristic areas. Finally, the regional roads are usually narrower single carriageway roads that connect smaller towns and villages and provide access to most of the beaches and touristic attractions. Their status varies in terms of quality and state of repair.






**Figure 25:** Greek National Road Network – indicative photos

The road network in islands consists of regional and municipal roads of average or poor - in many cases – quality, and road safety attributes are inadequate (e.g. unhelpful road signage, poor road surfaces, lack of safety barriers).



Regional road in Kalymnos Island




Sign indicating one-way traffic and buses contra-flow movement (only in Greek language).Andros island



Regional road in Spetses Island



Regional road in Corfu Island

**Figure 26:** Regional Road Network in islands – indicative photos

### 2.3.2 The road safety status of Greek road infrastructure

A large-scale road safety assessment of the major road network in Greece was conducted within the framework of the EU funded SENSoR project[2] in 2013. The project applied the international, standardized iRAP protocols for the road safety inspection and assessment of 3,600 km of the main road network, and produced Star Rating Maps that visualize on a 5-Stars scale (1 Star= min to 5 Stars=max) the safety capacity of the inspected roads (**Figure 27**).

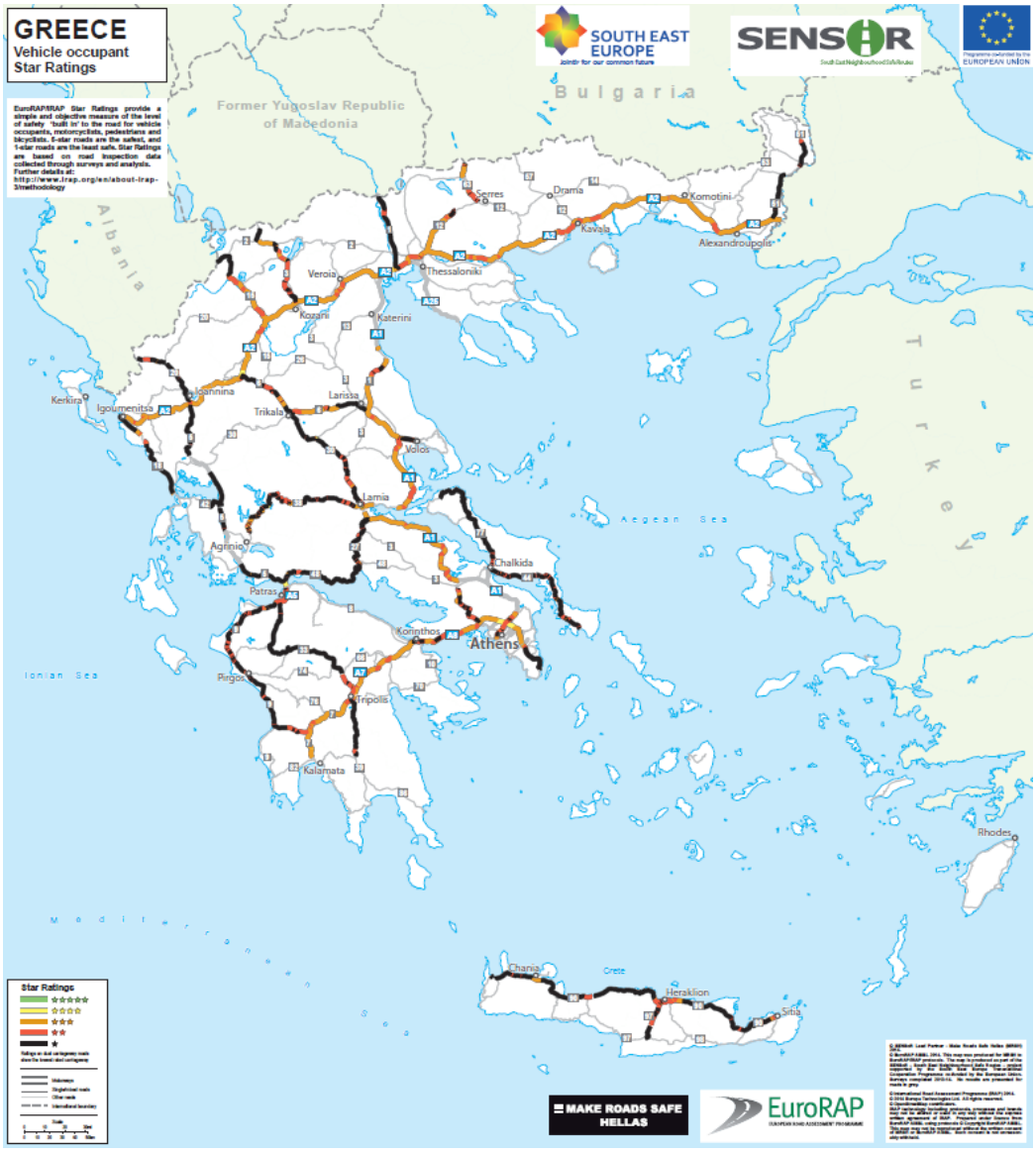



**Figure 27:** SENSoR Star Rating Map for vehicle occupants (*Source: SENSoR Project*)

[2] South East Neighborhood Safe routes (SENSoR) Project: http://sensorproject.militos.org

The results of the road safety assessment of the main road network for vehicle occupants and motorcyclists are summarized in the following **Figure 28**.

| Star Ratings | For vehicle occupants | For motorcyclists |
|---|---|---|
| 5 Stars | ~0% | ~0% |
| 4 Stars | 2% | 0% |
| 3 Stars | 45% | 2% |
| 2 Stars | 14% | 22% |
| 1 Star | 39% | 76% |

**Figure 28:** SENSoR Star Rating results (*Source: SENSoR Project*)

It is noticed that the upgraded motorway network of the country achieved a satisfactory score 3 or 4 Stars, while the rest (i.e. excluding motorways) of the national network offers a minimum 1 Star or 2 Stars safety to vehicle occupants. The ratings for motorcyclists are even worse as the majority of the network falls into the 1-star high-risk category. Indicative examples of high-risk road sections are shown in the following pictures.



Median with street light poles and no safety barrier. No safety barrier at the passenger's side.



Intersection with poor road surface, delineation and pedestrian crossing



Absence of a pedestrian footpath in a village (National Road 38)



Intersection with poor road surface, delineation and lack of pedestrian crossing (National Road 18)

**Figure 29:** Indicative examples of 1-Star road sections

## 2.4 Traffic Safety Culture and its impact on road safety in touristic areas[3]

It is widely recognized that safety culture is important for traffic safety, and the concept is applied to an ever-increasing range of sectors and industries, including professional and private transport. Therefore, it is decisive to establish the importance of transport safety culture (TSC) in influencing transport safety behaviour and safety outcomes, and to clarify how this knowledge can be used to enhance transport safety. Transport safety culture (TSC) is defined as shared norms prescribing certain transport safety behaviours, shared expectations regarding the behaviours of others and shared values signifying what's important (e.g. safety, mobility, respect, politeness) (Nævestad & Bjørnskau, 2012).

Recent research suggests that safety culture explains considerable variation in safety behaviour in various transport forms operated by both private and professional drivers (Nævestad & Bjørnskau, 2012). This research also suggested that in order to fully understand its effects on safety in transport, not only safety culture particular to organisations, but that particular to peer-groups, sectors, regions and nations should also be studied. A hypothesis can be made that differences in national TSC may help better understand national differences in fatality rates. Based on this, different national TSC should be identifiable in areas where drivers of different nationalities interact, such as touristic areas.

In this framework, a research project titled "Safety culture in private and professional transport: examining its influence on behaviours and implications for interventions", an empirical study, was conducted in Norway and Greece to examine whether and how membership in different socio-cultural units (nations, sectors, countries, organisations) influences transport safety behaviour and accidents in private and professional road transport. The project was funded by the Norwegian Research Council, and undertaken by the Institute of Transport Economics – TØI (Norway) and the National Technical University of Athens - NTUA (Greece).

Norway and Greece were selected to be compared since the road safety status in the two countries differs significantly. The road fatality rate of Norway is one of the lowest in the EU. Its development was similar to the EU average in the period 2001-2014 (European Commission,

[3] George Yannis, Alexandra Laiou, National Technical University of Athens, Greece
Tor-Olav Nævestad, Torkel Bjornskau, Institute of Transport Economics, Norway

2016). On the other hand, Greece has one of the worst transport safety records of all EU-27 countries (Yannis & Papadimitrou, 2012).

Within the project the TSC of private car and professional HGV and bus drivers in Norway and Greece was explored. The aims were to examine 1) safety behaviours related to personal injuries and accidents among private (private car) and professional (HGV, bus) drivers in Norway and Greece, and 2) factors influencing these behaviours.

The Norwegian professional driver respondents were recruited in 2016-2017 through the Norwegian researchers' contact with Norwegian transport companies and unions. Web links to the questionnaires were distributed along with an introductory text explaining the purpose of the survey and stressing that the surveys were confidential. The Norwegian private driver respondents were recruited through the Preference Database of the Norwegian Postal Service, consisting of 430,000 people in 2016, who had consented to receive information or advertising through the moving or holiday service of the Postal Service. E-mails with web-links to the survey were submitted to 45,483 people in three Norwegian counties including the capital Oslo, based on differences in accident risk and attitudes. Of the 45,452 people who received the e-mail, 6,727 people (14,8%) opened the e-mail, and 645 (9.6%) completed the survey. In an attempt to increase response rates, Norwegian respondents were informed that they could participate in a draw for a present card of 2000 NOK, if they wanted to.

The Greek respondents were recruited through a marketing research company in Greece, under the scientific supervision of NTUA. Recruitment of drivers in Greece was also difficult, therefore it was decided to approach candidates in person and further explain the scope of the survey. This helped eliminate their doubts and fears about confidentiality, and the use of the information they would provide. The private drivers in Greece were sampled in the capital Athens and the island of Rhodes. This sampling is based on an assumption that the TSC on an island could be different from the capital, as an island is a geographically enclosed area, and as Rhodes has many tourist drivers.

The final study sample includes 596 private car drivers and 216 professional drivers from Norway and 287 private car drivers and 200 professional drivers from Greece. The survey themes included demographic variables, safety behaviours, national TSC index and safety outcomes.

The results show that Greek drivers are more inclined to commit aggressive violations than Norwegian drivers. It was hypothesized that if traffic safety behaviours were more similar among private and professional drivers within the national samples than among drivers across the national samples, this could be due to the influence of the national TSC. The results are in accordance with this hypothesis, despite the professional drivers' similar periodic training and organisational membership in the two countries. It is argued that this seems to indicate the existence of different national TSCs.

Different driver groups in Greece (private and professional) have similar scores when describing the safety behaviours of other drivers in their country. This does not apply in the Norwegian sample, but the difference between the Norwegian private and professional is smaller than between any of the Norwegian groups and the Greek groups. This seems to indicate that what is measured as national TSC, to some extent, reflects the safety behaviours that the different national groups ascribe to other drivers in their country and not just a false consensus bias to justify their own behaviour.

The results indicate that aggressive violations, which were found to be related to national TSC, are related to accident involvement. Thus, it is not unreasonable to hypothesize that differences between national TSC may shed light on national differences in fatality rates.

Tourism is a frequent cause of trip generation resulting in road users finding themselves in unfamiliar environments. Tourists often have inadequate knowledge of the local road and traffic conditions which may reduce their overall skill and readiness to act. Moreover, local drivers also suffer adverse safety effects due to the interaction between local and nonlocal drivers, erratic driving and unexpected manoeuvers by tourist drivers. Therefore, exploring TSC in different areas of Greece based on tourism and other factors such as the type of vehicle, and driver age and gender is meaningful.

Within the same research project, TSC among car drivers and motorcycle riders in Athens and Rhodes expressed through the prevalence of more violations in touristic areas was also explored. For the purposes of the study, 30 non-professional car and motorcycle drivers in Athens and in Rhodes were recruited, to participate in a relevant in depth interview. Perceptions, emotions and characteristic behaviors relevant to driving were examined, by utilizing qualitative research approach.

Results clearly indicated a series of factors that need to be addressed, such as the claimed absence of what is perceived as safety culture, the importance of the continual traffic police presence, the strictness and the severity of the penalties assigned to dangerous road behaviors and the significant role of the driving instructor in the formation of safety culture in Greece.

Imprinting the perceived traffic safety culture and the typical behaviors of locals and tourists in Greece, may help define the relative consequences and contribute to the development of strategic safety interventions. Findings set out in the following **Chapter 3** may contribute to this discussion.

# 3 TOURISTS PERCEPTIONS ABOUT MOBILITY RISKS IN GREECE

## 3.1 Introduction

The aim of this Chapter is to present the results of a national survey on international tourists' perceptions about road safety and mobility in Greece. The survey was jointly initiated by four Greek universities, namely the National University of Athens/Sector of Industrial Management & Operational Research, the University of Macedonia/Department of Applied Informatics, the University of the Aegean/Department of Product and Systems Design Engineering and the Hellenic Open University. The project was supported by the Eastern Alliance for Safe and Sustainable Transport (EASST) and Make Roads Safe Hellas.

The main purpose of the survey was to capture and analyse international tourists' perceptions on road safety and mobility in Greece and investigate whether these perceptions affect the ultimate value of their overall travel experience. The results of the survey are expected to highlight potential needs and future areas of improvement at national and regional level, while simultaneously supporting the development of policy and industry-wide recommendations towards increasing international tourism and road safety in Greece. The latter will be subsequently discussed in **Chapter 4** of this report**.**

The survey was addressed to international tourists in Greece and was implemented in popular touristic destinations in Greece with special focus on airports representing main gateways of incoming touristic flows (i.e., Athens International Airport "El. Venizelos", Thessaloniki International Airport "Makedonia", Chania International Airport "I. Daskalogiannis), as well as other historical sites and monuments attracting a large number of international tourists (e.g., Acropolis Museum). The data collection process took place during the period August - December 2018 to account for the high seasonality profile of international tourists' arrivals in Greece.

A structured data collection instrument (i.e., questionnaire), provided in six languages (English, German, French, Russian, Spanish, Norwegian), was used to elicit the perceptions of international tourists, in a 6-7 minute personal interview, with view to the following six dimensions of analysis: i) demographics and general travel information (e.g., length of visit, city/area of stay, sources of road safety-related information), ii) personal responsibility and

responsible driving culture (e.g., compliance with traffic code, presence of traffic police), iii) road infrastructure (e.g., infrastructure conditions, road signs, street lighting, mobility limitations), iv) rented vehicles (e.g., condition of rented vehicle, provision of safety equipment), v) driving behaviour of others (e.g., other drivers, taxi drivers) and vi) overall influence on general travel experience.

In total, 1,349 completed and analysable questionnaires were collected (514 responses from Athens, 419 from Thessaloniki and 416 from Chania) and analysed on an anonymous basis. In line with the typical distribution of incoming flows of tourists in Greece, the large majority of responses stem from Germany (18.9%) and the U.K. (18.8%), as well as Italy (6.4%), France (5.0%) and the United States (4.2%) comprising the highest frequency countries of residence in the interviewees' sample (**Figure 30**).

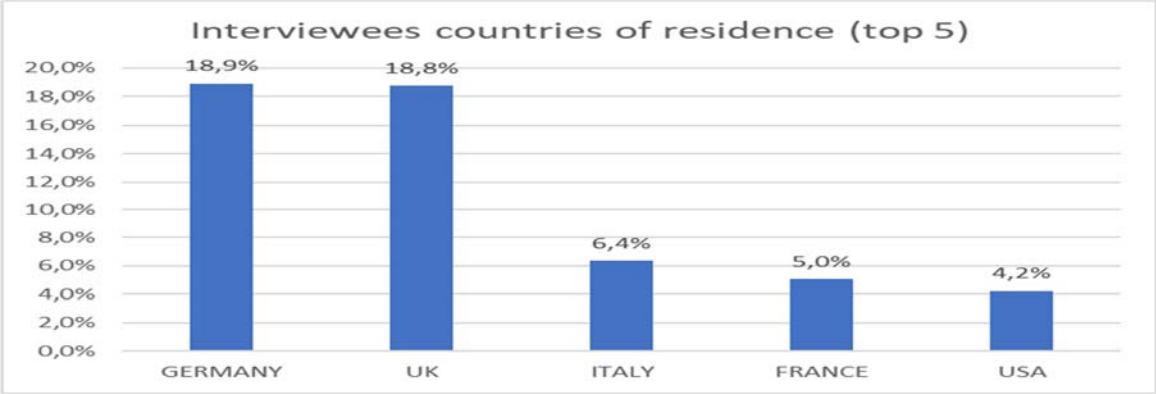



**Figure 30:** Survey sample by interviewees' country of residence

The sample respondents split almost equally between females (48%) and males (52%), while there has been a clear dominance (two thirds) of people between the ages of 25-60, over young respondents (less than 25 years old) and the elderly (over 60 years old) (**Figure 31**).

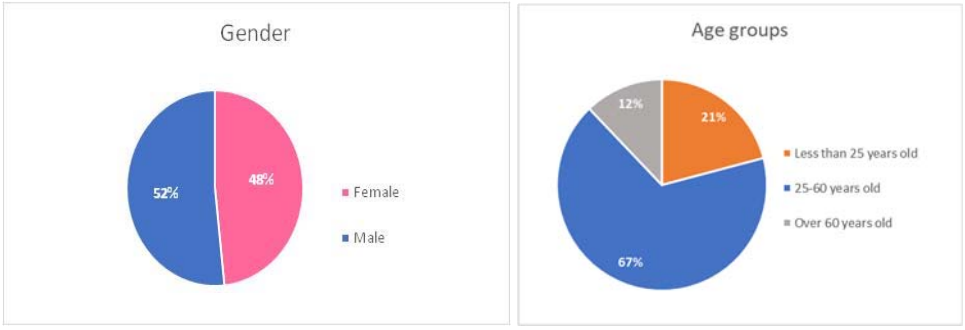



**Figure 31:** Survey sample by gender and age group

## 3.2 Findings

In the following paragraphs, the main findings of the survey are presented and discussed, with respect to the following six dimensions of analysis:

- general travel information
- personal responsibility and responsible driving culture
- road infrastructure
- rented vehicles
- driving behaviour of others and
- overall influence on general travel experience

### 3.2.1 General travel information

The sample of respondents included mostly tourists travelling for leisure/non-business purposes (90%), having visited Greece at least twice (72%), with their current stay in Greece being for at least 1-4 weeks (76%). The average driving experience of the interviewed tourists was 20 years. Almost eight out of ten respondents (78%) used a rented car and almost one fifth (17%) of the visitors experienced a safety critical incident during their last stay in Greece. One can, therefore, claim that the "typical" respondent is an experienced driver, sufficiently familiar with the road transport system and driving practices/patterns in Greece, having repetitive and reasonably long stays in Greece mostly for leisure tourism purposes.

Interestingly, a large number of interviewed tourists (46%) searched for and obtained some kind of road safety-related information before or while traveling to Greece. However, this information was mostly obtained from unofficial sources or local tourism professionals rather than official Greek bodies/associations/authorities representing the collective interests of the Greek tourism industry, or at least official information sources/portals in Greece. In particular, the acquisition of relevant information from tourists came from the following sources:

i. unofficial sources (e.g., relevant forums, websites, friends) (46%),
ii. local tourism professionals (e.g., hotels, rental companies) (34%),
iii. official sources of the tourist's country of residence or international organizations (12%), while,
iv. only 8% of tourists found relevant information from official Greek sources.

### 3.2.2 Personal responsibility and responsible driving culture

The ease of adaptation to local driving habits and culture was not a major concern for most respondents (drivers), regardless of gender (**Figure 32**). Overall, six out of ten respondents said they found it easy to adapt to local driving habits and culture with somewhat lower percentages demonstrated by female (56%) compared to male (64%) respondents. On the other hand, there is still a notable number of respondents (approximately 17%), mostly pertaining to females (22%), experiencing serious adaptation problems. Surprisingly, those aged between 25-60 (62%) and people over age 60 (60%) were found to be more easily adaptable compared to young respondents (55%) (**Figure 33**). This could be attributed to relatively less driving experience among younger drivers.

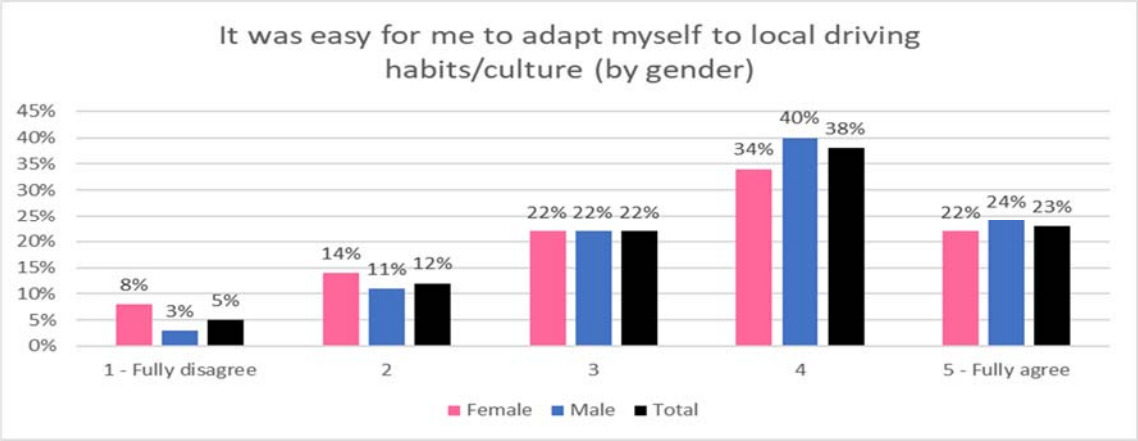



**Figure 32:** Ease of adaptation to local driving habits/culture (by gender)

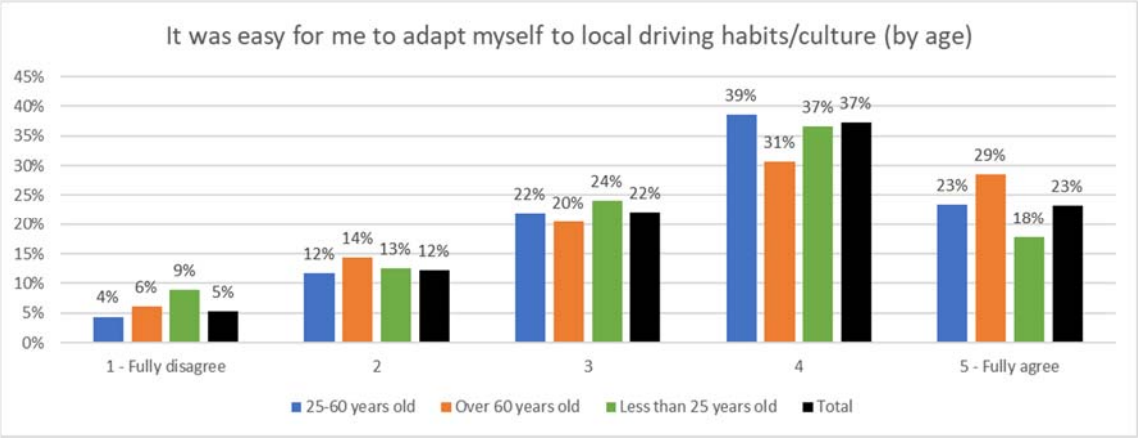



**Figure 33:** Ease of adaptation to local driving habits/culture (by age group)

Despite the stated ease of adaptation to local driving habits and culture, a notably high percentage of respondents (41%) felt less restricted to follow the traffic code while on vacation in Greece (**Figure 34**). Young drivers, both male and female, are more inclined to non-compliance with the traffic code at almost one out of two young tourists (**Figure 35**). In a similar context, female respondents were generally found to be slightly more consistent than male respondents with view to compliance with the "Don't drink and drive" rule (**Figure 36**). Responsible driving culture in the form of compliance with the "Don't drink and drive" rule was claimed by almost 80% of respondents. Compliance was reported at higher levels by respondents aged 25-60 (82%) as compared to older (75%) and particularly younger (71%) respondents, who more frequently admitted to delinquent behavioral patterns (**Figure 37**). Overall, it should be highlighted that 11-12% of respondents aged over 25 years old, and most importantly, 20% of young respondents declared themselves to be non-compliant with the "Don't drink and drive" rule while driving in Greece. This finding seems to be rather alarming on the grounds that there is usually a tendency to under admit this sort of infringement.

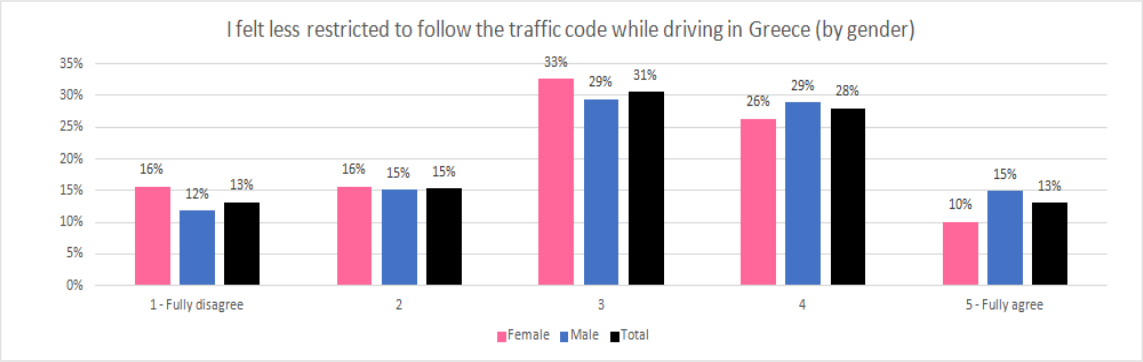



**Figure 34:** Compliance with the traffic code (by gender)

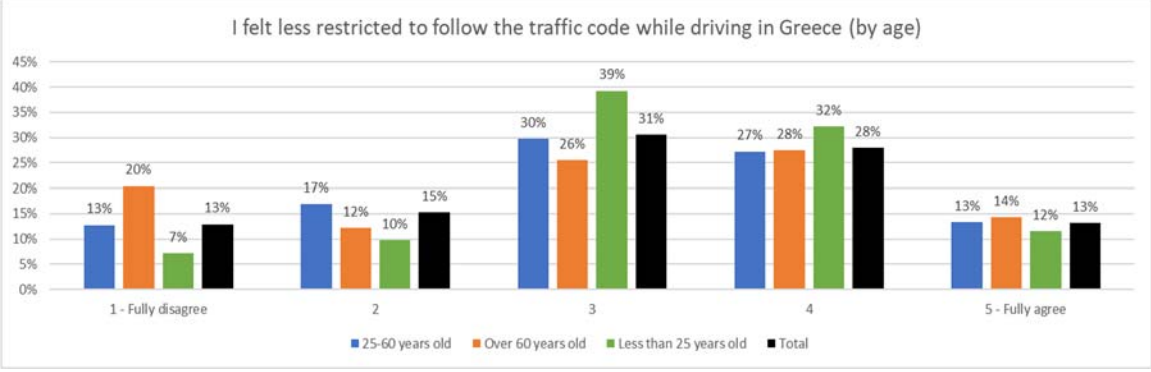



**Figure 35:** Compliance with the traffic code (by age group)

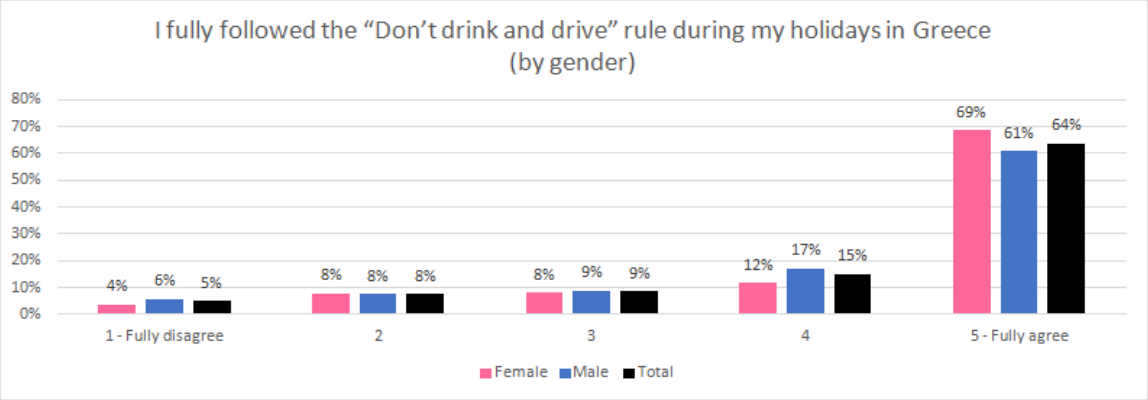



**Figure 36:** Responsible driving culture (by gender)

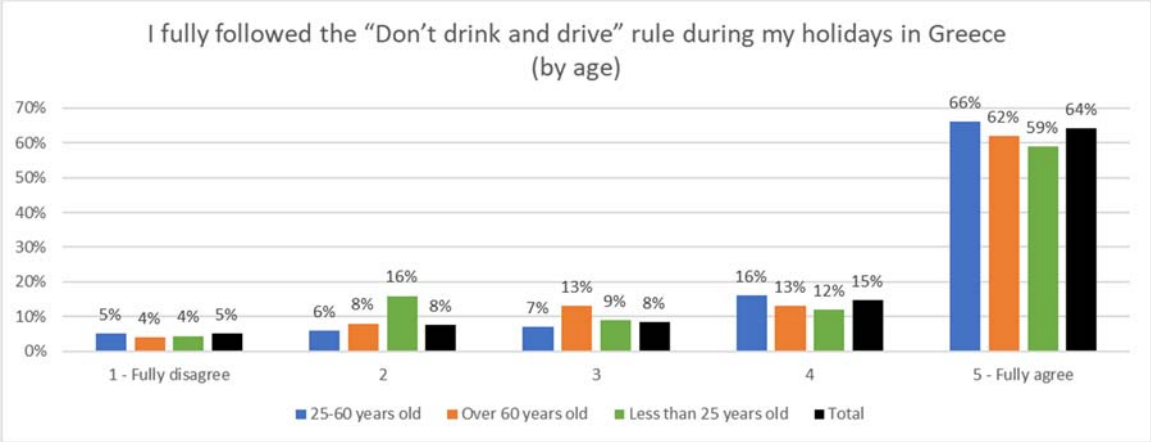



**Figure 37:** Responsible driving culture (by age group)

Despite the relatively high levels of non-compliance with the traffic code and the "Don't drink and drive" rule, the supervision or enforcement of compliance through the presence of traffic police was not considered sufficient. As a matter of fact, 42% of the respondents reported that the presence of traffic police was insufficient for road safety purposes (**Figure 38**). Young drivers tended to be more dissatisfied (54% of respondents) by the sufficiency of presence of the traffic policy than those aged 25-60 (39% of respondents) and the over-60s (41% of respondents) (**Figure 39**).

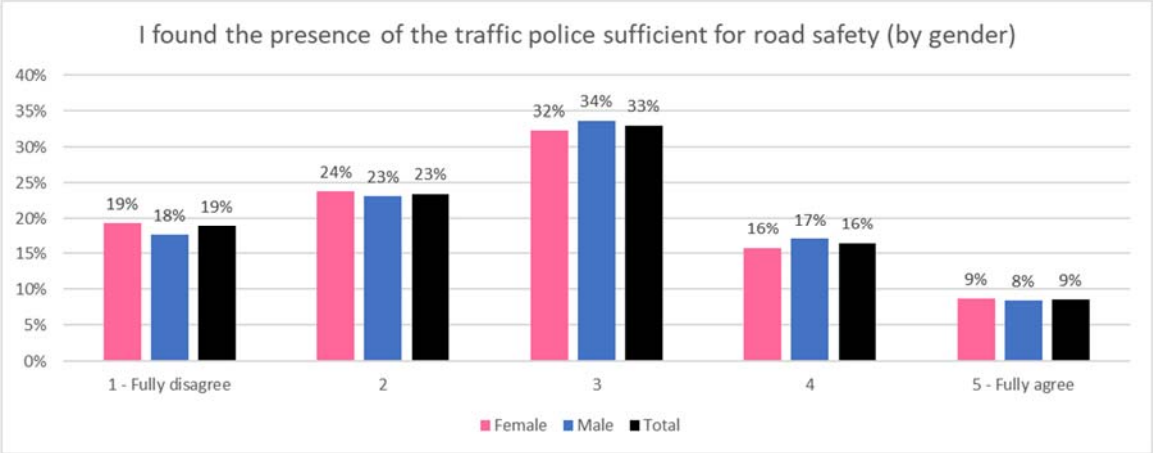



**Figure 38:** Presence of traffic policy (by gender)

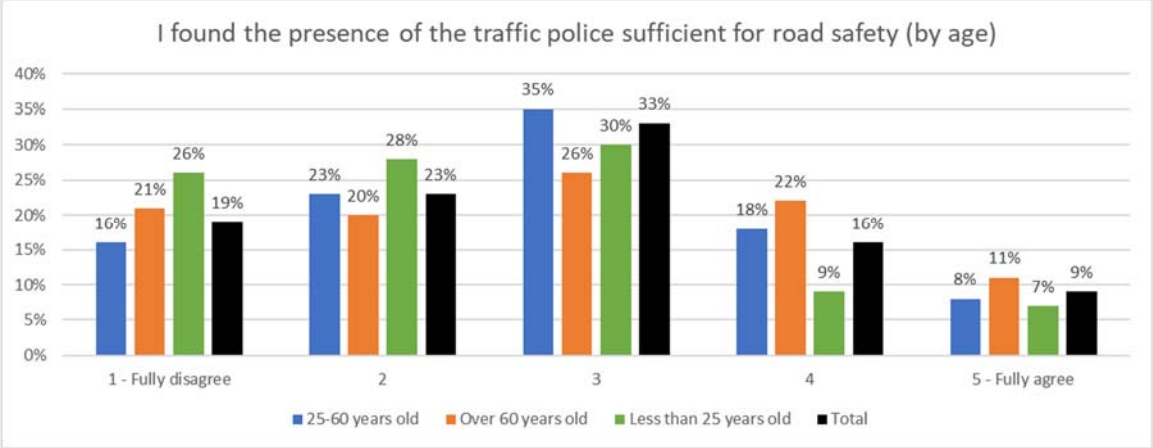



**Figure 39:** Presence of traffic policy (by age group)

### 3.2.3 Road infrastructure

The perceptions of interviewed tourists with respect to the road infrastructure and its underlying operating conditions are presented on the basis of the type of road transport user, and particularly drivers, pedestrians and people with mobility limitations.

#### *3.2.3.1 Drivers*

The interviewed tourists were asked to provide their perceptions of the safety of the broader road infrastructure in Greece. A significant number of respondents (43%) expressed their concerns about the safety and operating conditions of road infrastructure (**Figure 40**). This finding seems to be in line with the high fatality rates experienced mostly by *drivers* in road accidents (see **§**Error! Reference source not found.). The situation deteriorates further when it

comes to the young age group, where 57% of young drivers did not consider the road infrastructure to be safe (**Figure 40**). This finding is in line with the increased traffic and accident rates of young persons in touristic regions during the summer period (see **§2.2.2**). On the other hand, differences by gender were practically negligible.

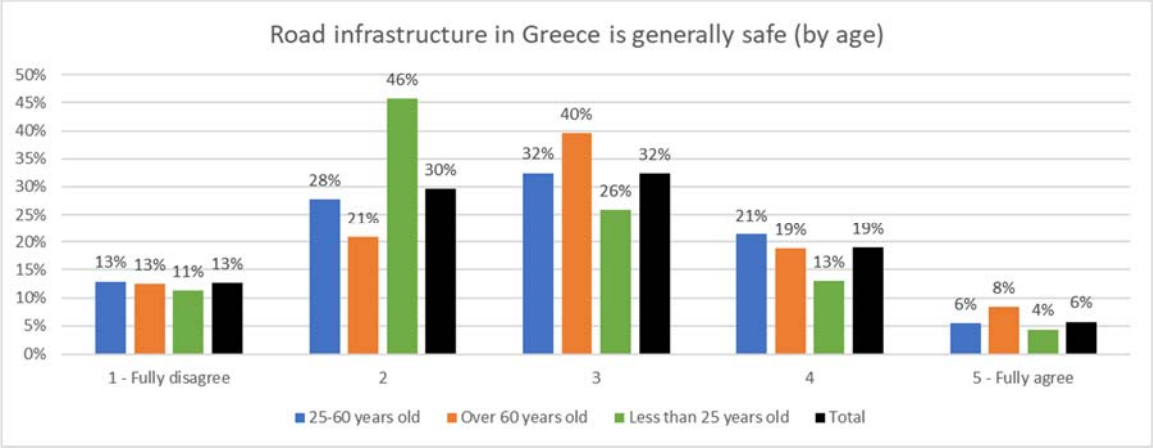



**Figure 40:** Condition of road infrastructure (by age group)

Another interesting finding is that significant differences in responses are observed in relation to the three city samples (**Figure 41**). More specifically, 52% of tourists in Chania, as compared to 39% of respondents in Thessaloniki and 38% of respondents in Athens, found road infrastructure unsafe. The higher concentration of safety concerns in Chania and more generally in Crete is reasonable if the poor status of the National Road 90 (a highway that runs along the north coast of the island) is taken into account.

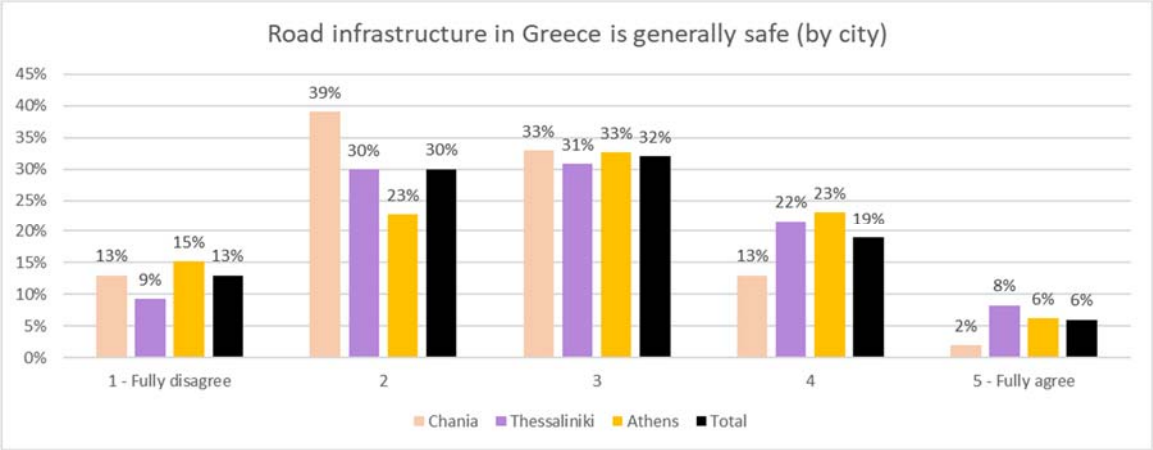



**Figure 41:** Condition of road infrastructure (by city)

Some problematic areas were also identified in relation to the signing and lighting of the road network. A large number of respondents (36%) doubted the helpfulness of road signs in Greece. This problem is further underlined by the elderly age group (42% of respondents) (**Figure 42**) and deteriorates further in Chania (44% of respondents) in relation to Thessaloniki (32% of respondents) or Athens (32% of respondents) (**Figure 43**).

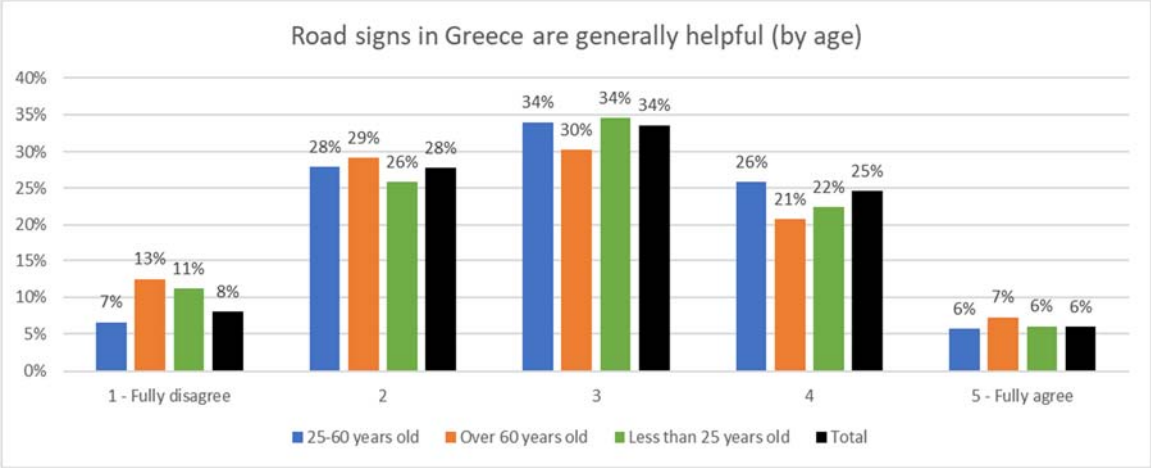



**Figure 42:** Helpfulness of road signs (by age group)

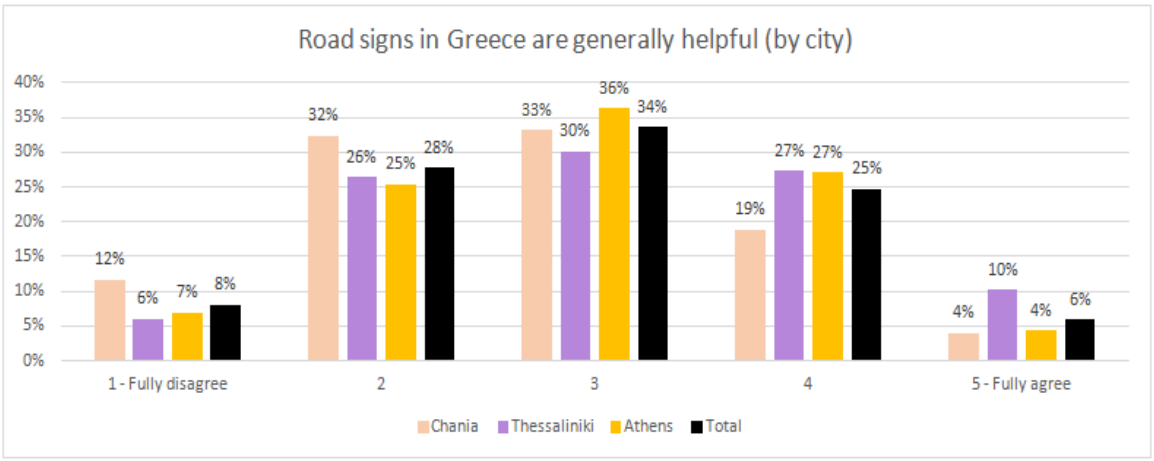



**Figure 43:** Helpfulness of road signs (by city)

Similarly, street lighting problems were reported by 39% of respondents. The age of the respondent was not a major differentiating factor in that case (**Figure 44**), but street lighting problems seem to appear more frequently in Chania as compared to Thessaloniki or Athens (48% versus 35-36% of respondents) (**Figure 45**).

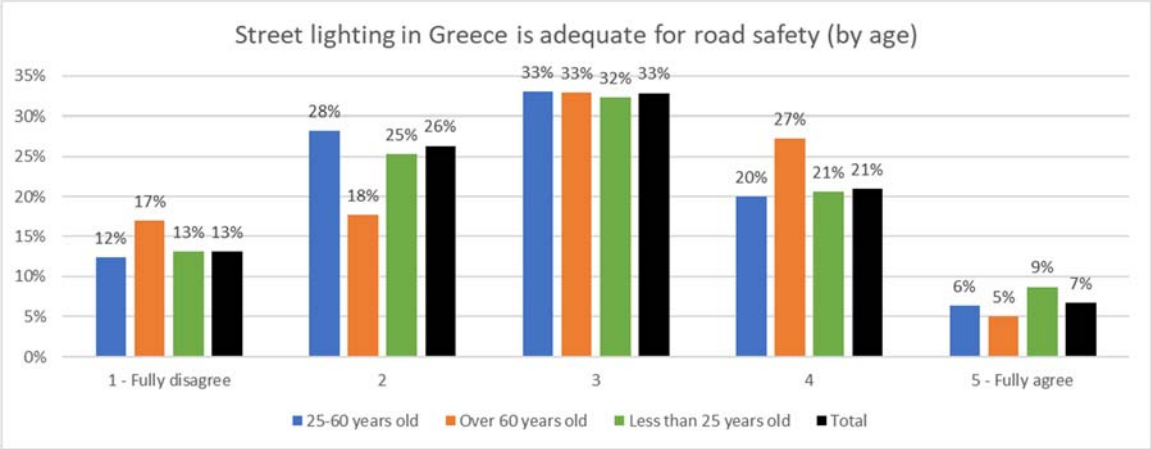



**Figure 44:** Adequacy of street lighting (by age group)

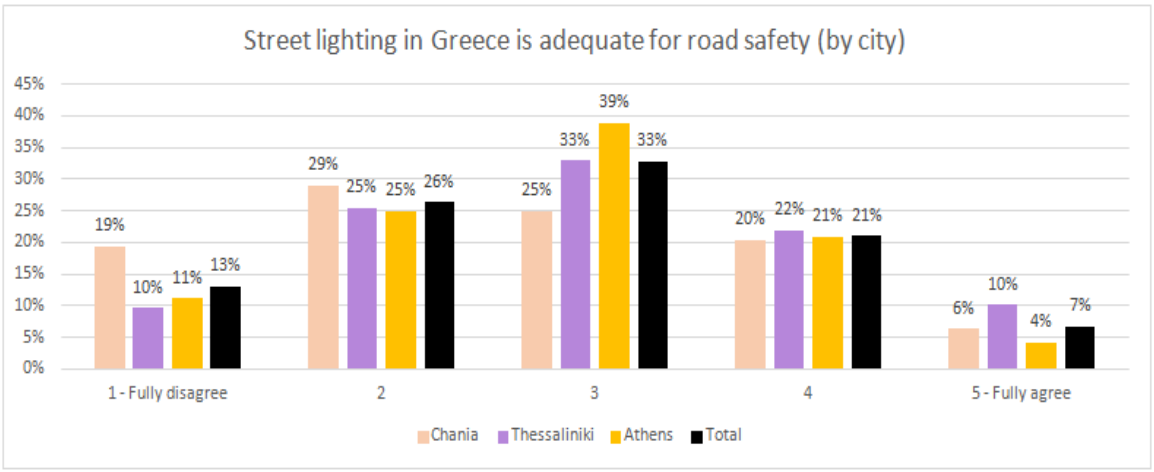



**Figure 45:** Adequacy of street lighting (by city)

### *3.2.3.2 Pedestrians*

From the pedestrians' viewpoint, more than half (56%) of interviewed tourists did not consider road infrastructure (e.g., roads, pavements, pedestrian crossings) in Greece as safe for pedestrians. Surprisingly, this percentage is higher in the young age group (62% of respondents)

as compared to respondents aged 25-60 (55%) and those over 60 (49%) (

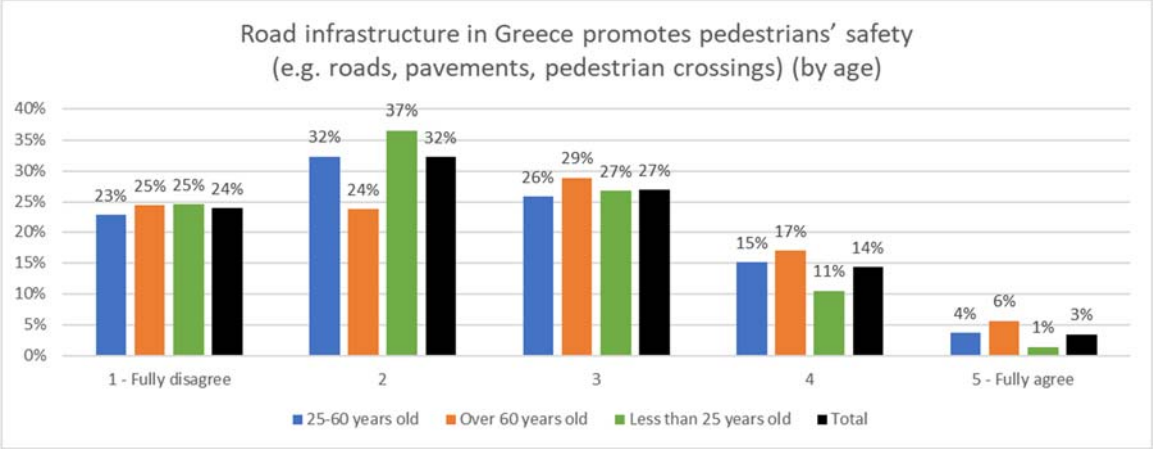



**Figure 46**). This could be potentially attributed to the fact that young people go out more, hence leaving more protected "packaged holiday" areas. Moreover, road infrastructure in Chania was found less pedestrian-friendly (64% of respondents) compared to Thessaloniki and Athens (52% of respondents in both city samples) (**Figure 47**).

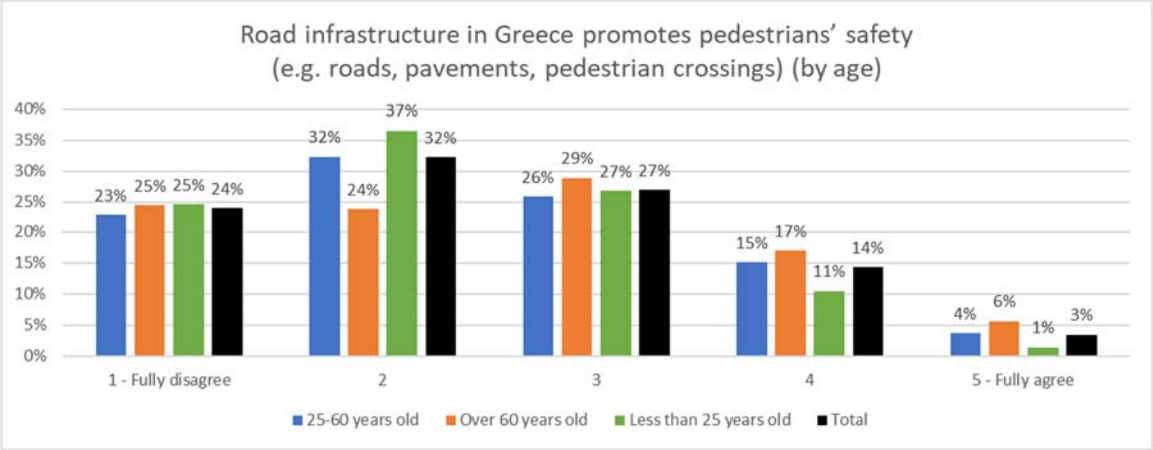



**Figure 46:** Pedestrian safety (by age group)

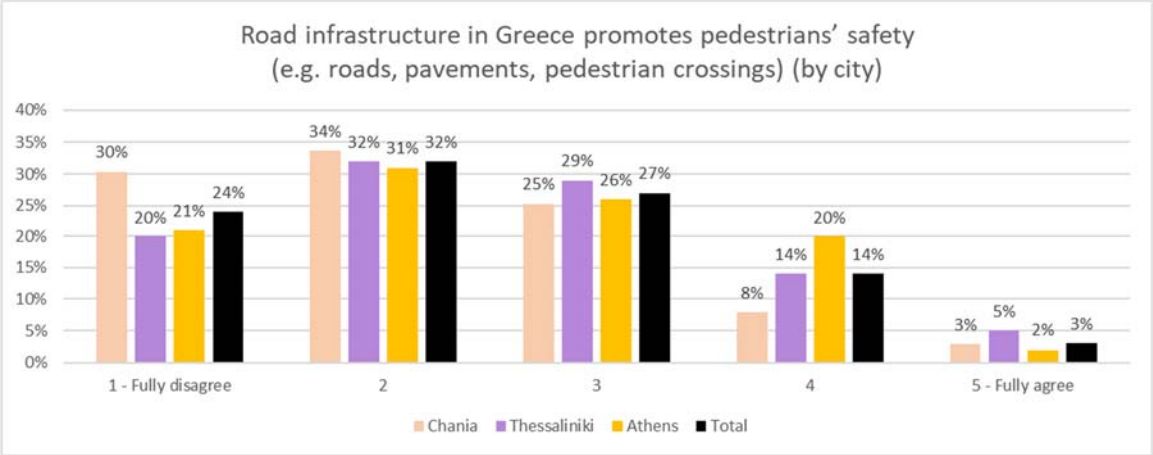



**Figure 47:** Pedestrian safety (by city)

### *3.2.3.3 People with mobility limitations*

Difficulties have been observed by the majority of the interviewed tourists in relation to the friendliness of infrastructure and the use of public transport by persons with reduced mobility (e.g., disabled, elderly, families with small children). Notably, 64% of respondents found it difficult for a person with mobility limitations to enjoy walking in Greece. These findings do not differentiate by age group (**Figure 48**), however, people with reduced mobility may find increased difficulties in Crete (Chania) (69% of respondents) and Athens (67% of respondents), as compared to Thessaloniki (57% of respondents) (**Figure 49**).

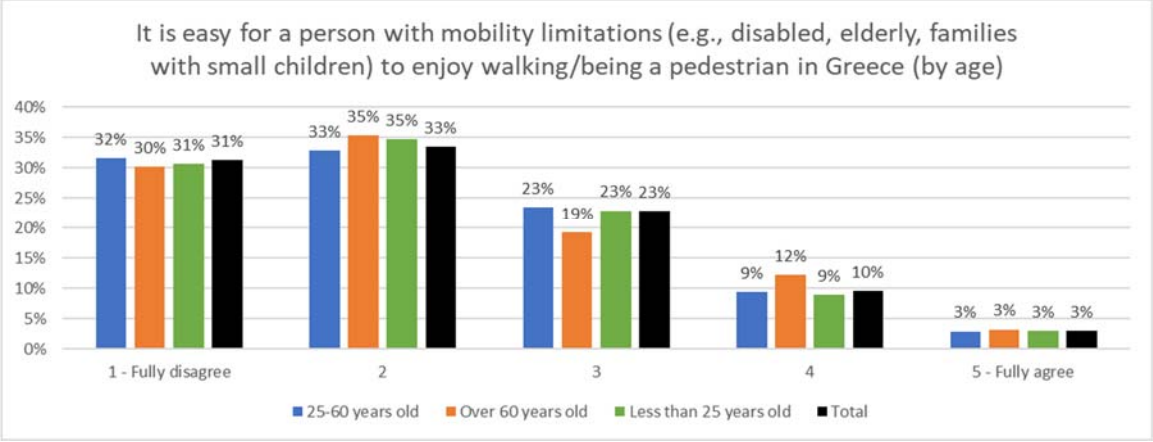



**Figure 48:** Ease of walking/being a pedestrian for a person with mobility limitations (by age group)

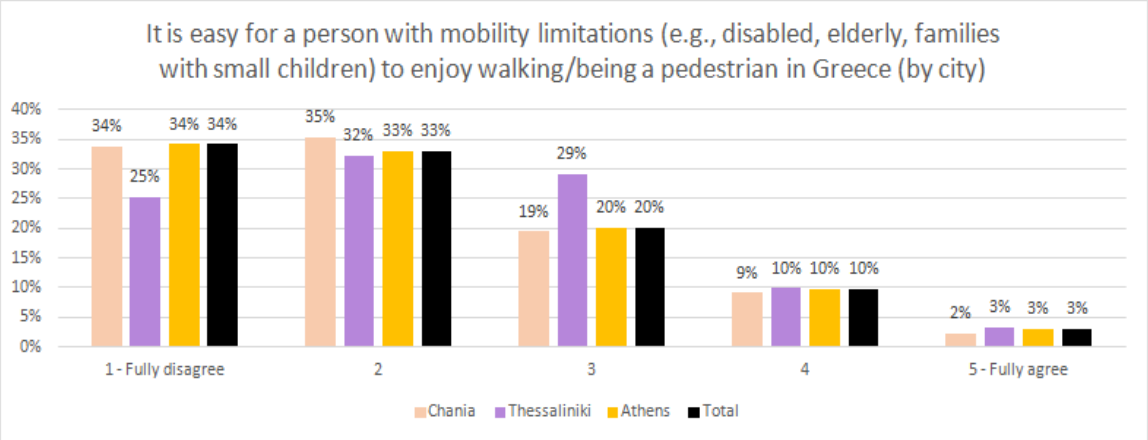



**Figure 49:** Ease of walking/being a pedestrian for a person with mobility limitations (by city)

Similar difficulties for a person with reduced mobility have been observed in using public transport. One out of two respondents (51%) believed that it is difficult for a person with mobility limitations to use public transport in Greece, while this difficulty seems to be of more concern to young and elderly people (59% and 56% of respondents, respectively) compared with those aged 25-60 (49% of respondents) (

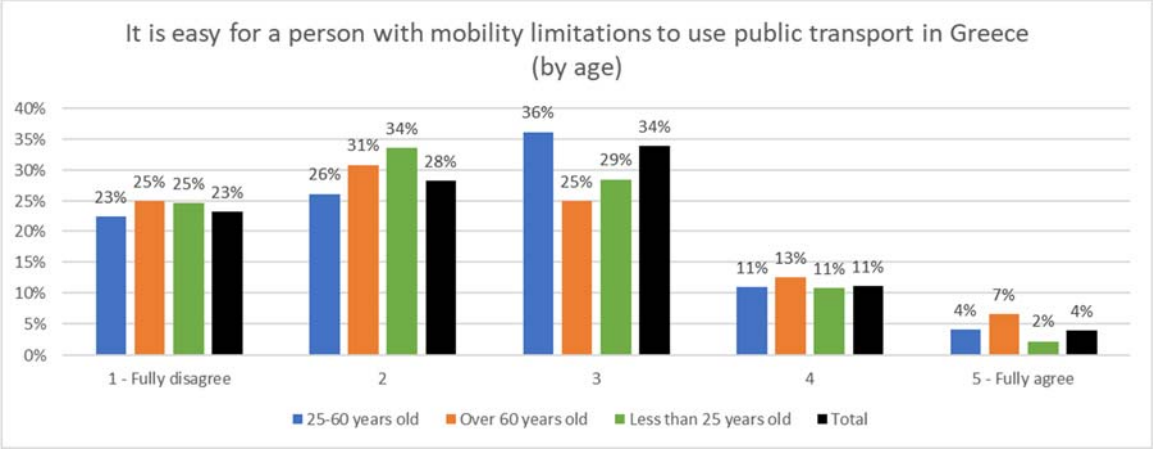



**Figure 50**). On the other hand, no substantial differences were observed among the three cities participating in the survey (**Figure 51**).

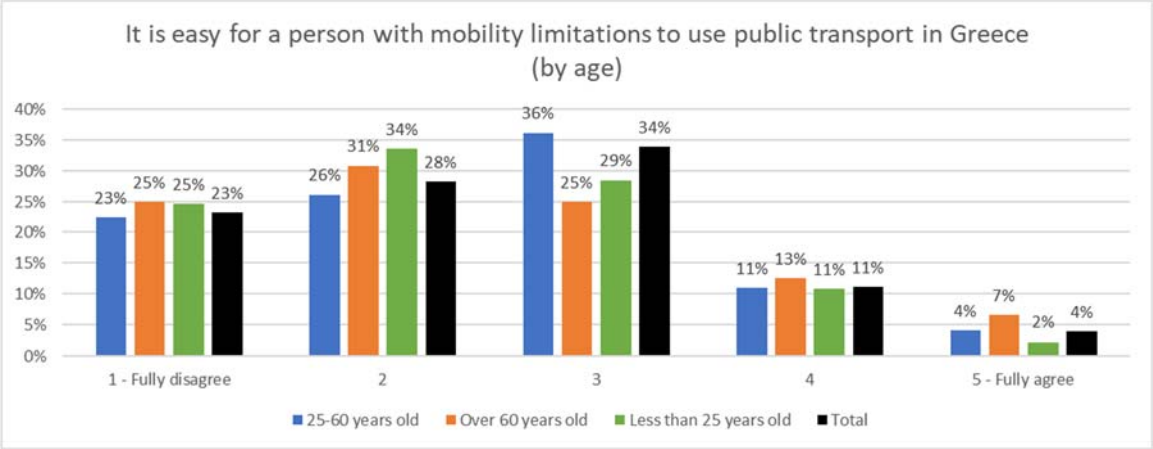



**Figure 50:** Ease of using public transport for a person with mobility limitations (by age)

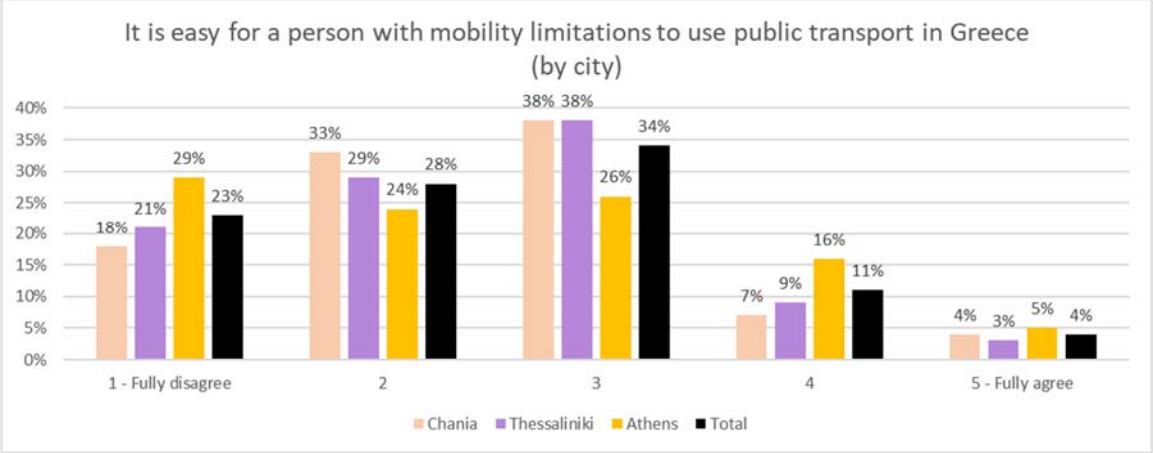



**Figure 51:** Ease of using public transport for a person with mobility limitations (by city)

### 3.2.4 Rented vehicles

Existing research in road transport safety has shown that the lack of familiarity of a driver with a rented vehicle, as well as the condition (e.g., insufficiently maintained) of the rented vehicle represent potential reasons behind high accident rates for tourists. According to our analysis, this does not seem to be a major concern for the majority of respondents (71%), who have found the condition of the rented vehicle as above average to excellent. On the other hand, almost 11% of respondents found that the rented vehicle was not well maintained. Female drivers were slightly less satisfied with the vehicles' condition than males (**Figure 52**). Moreover, young drivers tended to expect better condition of the rented vehicles than

respondents aged over 25 (

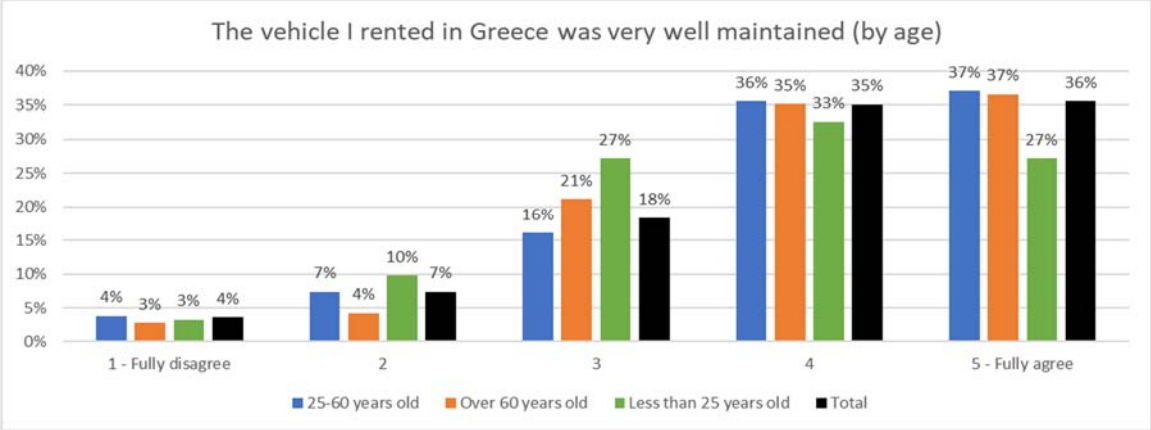



**Figure 53**).

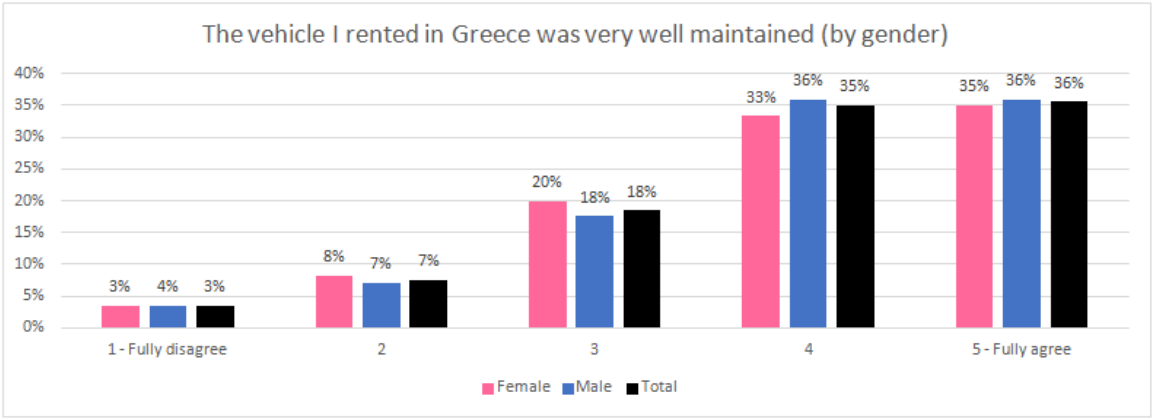



**Figure 52:** Condition of rented vehicle (by gender)

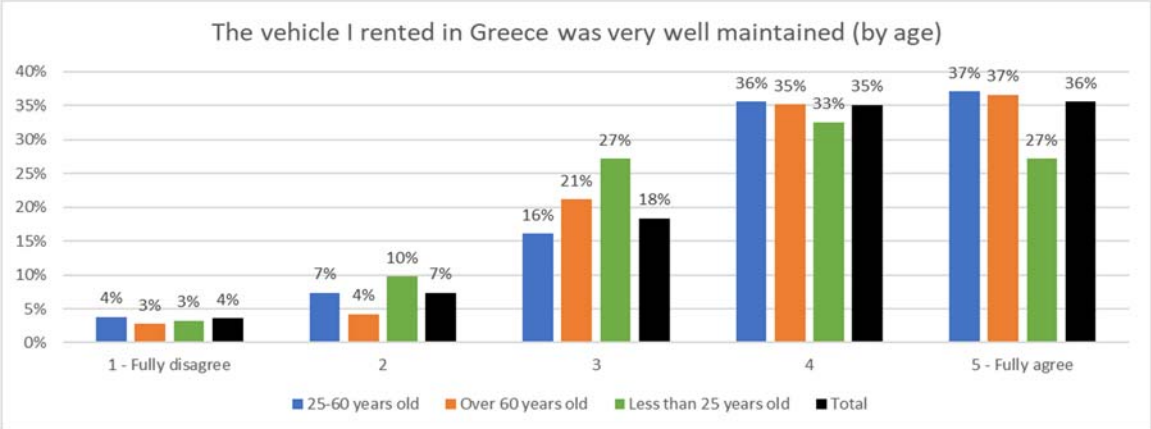



**Figure 53:** Condition of rented vehicle (by age group)

Car rental companies should ask drivers to provide a proper driving license (**Figure 54**) – something they seem to comply with according to our survey. However, one out of four respondents believed that car rental companies do not provide all the standard safety equipment (e.g., helmet, child car seat) (**Figure 55**). Generally, when it was provided by car rental companies, safety equipment was found to be in good condition by the majority of interviewed tourists (69% of respondents) (**Figure 56**), without notable differences accounted for by age or gender.

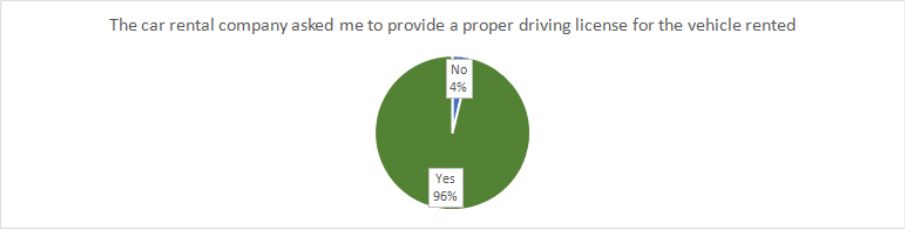



**Figure 54:** Driving license required by the rental company

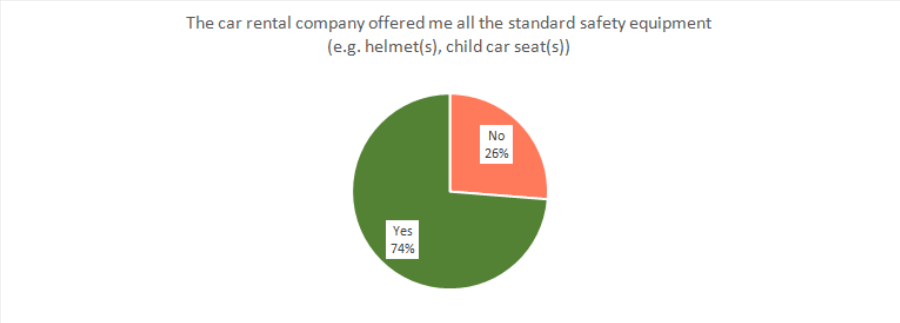



**Figure 55:** Safety equipment provided by the rental company

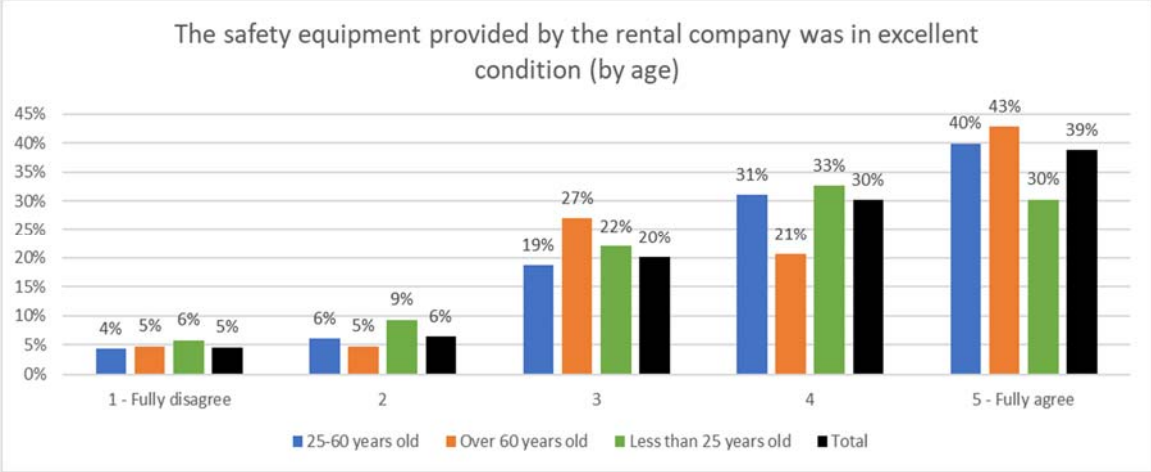


**Figure 56:** Condition of safety equipment provided by the rental company (by age group)

### 3.2.5 Driving behavior of others

In this section, we aimed to elicit the perceptions of interviewed tourists about other drivers' behavior, including taxi drivers as a major stakeholder in the road transport system with special emphasis placed on touristic periods and regions.

#### *3.2.5.1 Drivers*

The interviewed respondents were asked to indicate behaviors of other drivers that raised safety concerns. Not staying in lanes (46% of respondents), dangerous overtaking (45% of respondents), speeding (45% of respondents), illegal parking (44% of respondents), not respecting road signs and priority rules (43% of respondents), and not respecting pedestrians (41% of respondents) were reported as the major road safety concerns by interviewed tourists (**Figure 57**). A smaller number of respondents reported red light violations and drinking and driving as major safety concerns (28% and 25% of respondents, respectively). Despite the lower frequencies in responses, safety concerns related to red light violations and drinking are still on the very high side, considering the highly detrimental effects of accidents caused by such traffic rule infringements. Finally, no significant differences were detected in relation to gender or age groups.

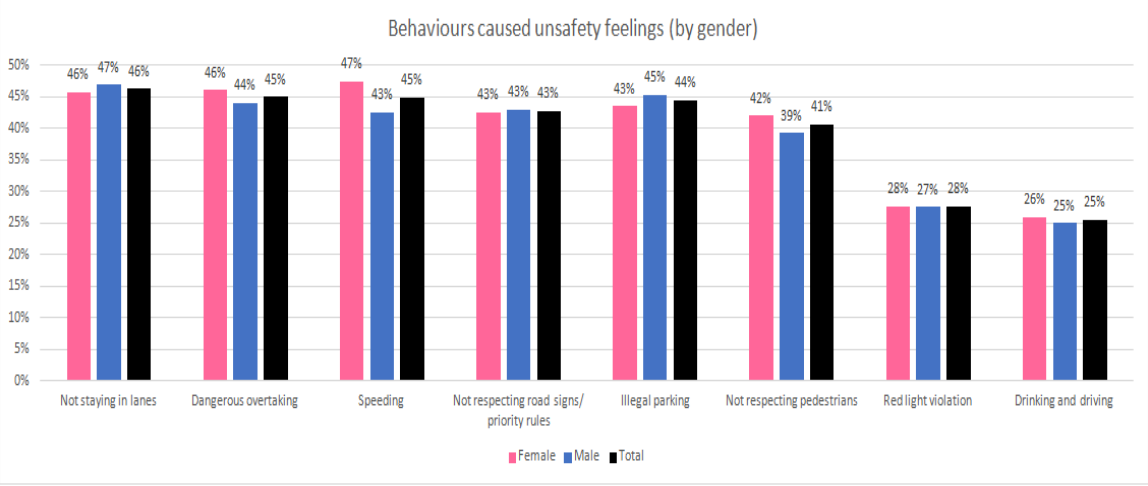



**Figure 57:** Other drivers' behaviour (by gender)

### *3.2.5.2 Taxi drivers*

As far as taxi drivers are concerned, the interviewed tourists reported inaccessible taxis for wheelchairs as a major concern (45% of respondents) (**Figure 58**). Furthermore, almost one third of respondents considered speeding, dangerous overtaking and the lack of child seats as a factor causing un-safe feelings in taxis, without notable differences accounted for by gender or age groups. On the other hand, almost two out of ten (18%) tourists experienced inappropriate personal comments, being rather high and unacceptable for a tourist-friendly country destination.

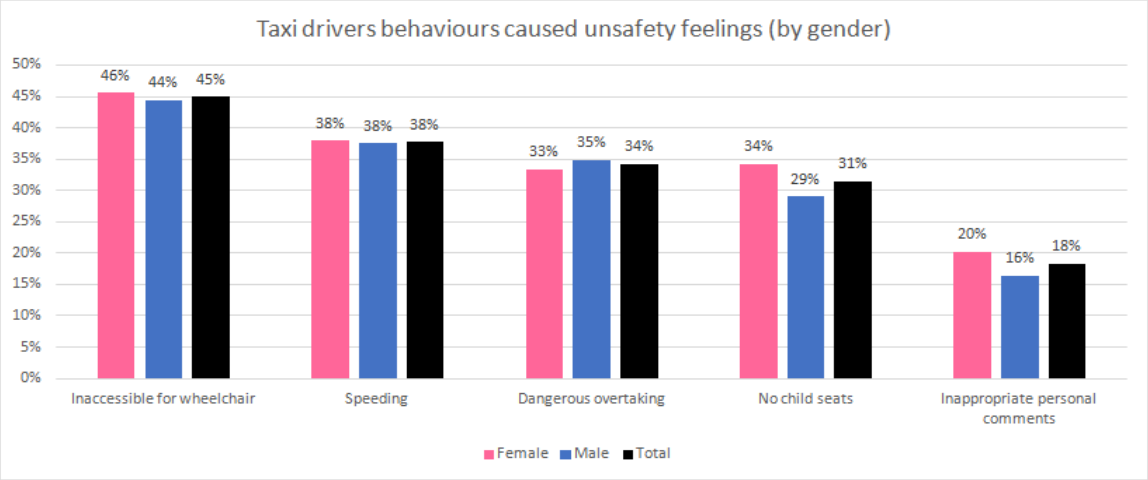



**Figure 58:** Taxi drivers' behaviour (by gender)

## 3.2.6 Overall influence on general travel experience

The aforementioned perceptions of tourists with respect to road transport safety are expected to influence their overall travel experience and consequently, have an impact on positive or negative recommendations to other tourists planning to visit Greece. Tourists declaring their willingness to recommend driving in Greece to a friend or colleague may act as promoters of the Greek touristic product. On the other hand, interviewed tourists who did not report themselves to be likely to recommend driving in Greece to a friend or colleague may potentially serve as detractors of the Greek 'touristic product,' while others may be more passive in terms of recommendation (or their lack of) to other tourists.

Within the framework of our survey, 60% of the tourists did not find themselves satisfied with the road safety conditions in Greece (**Figure 59**), a fact that may negatively influence the

image of the country as a safe touristic destination. Overall, only 12% of the interviewed tourists could be expected to act as 'promoters' recommending the driving experience in Greece, with 28% of respondents being passive. Young tourists were generally less satisfied and more critical, while higher percentages of potential promoters can be observed in the older age groups (**Figure 59**). On the other hand, no significant differences were observed with respect to gender. Finally, the overall travel experience seems to be more negatively affected in the case of Athens and Chania, concentrating a higher proportion of unsatisfied tourists with regard to road transport safety (66% and 61% of respondents, respectively) as compared to Thessaloniki (52% of respondents). In all cases, tourists that may potentially act as promoters of the Greek touristic product range between 8% in Athens, 11% in Chania and 18% in Thessaloniki (**Figure 60**).

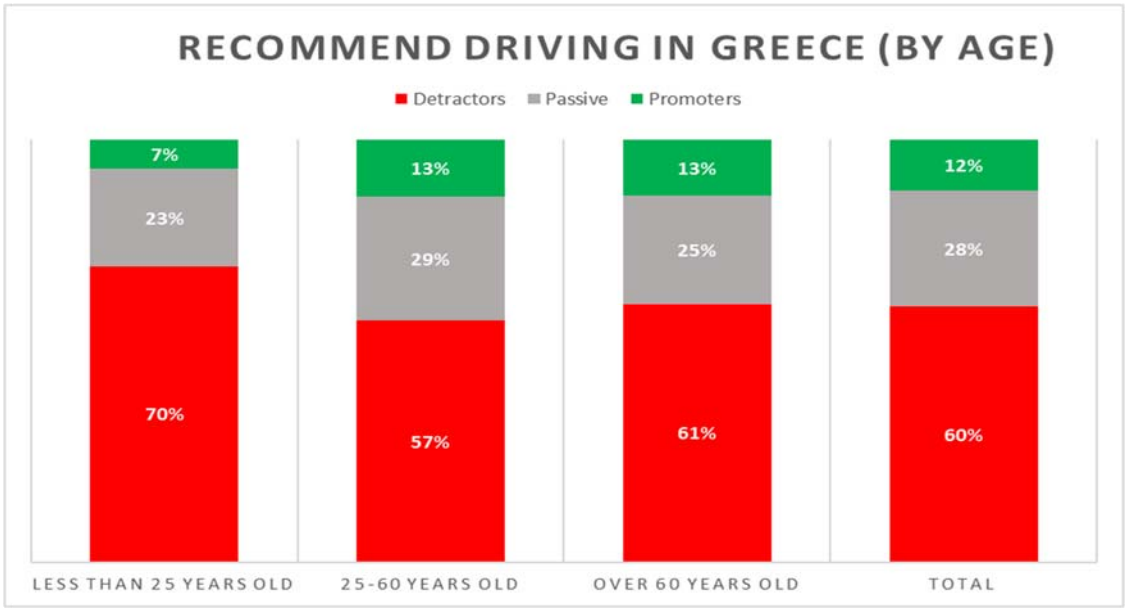



**Figure 59:** Recommend driving in Greece (by age group)

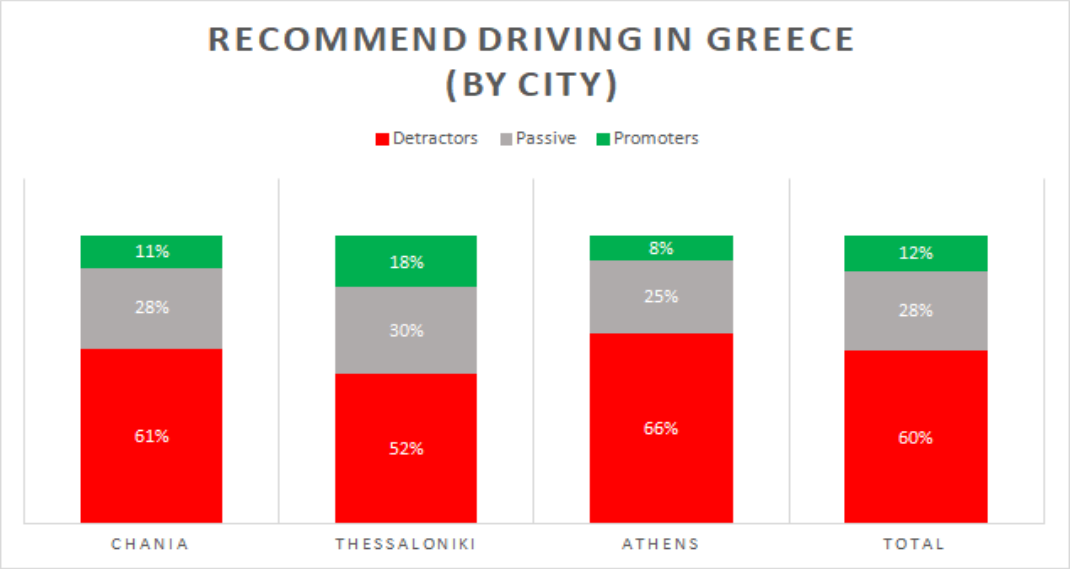



**Figure 60:** Recommend driving in Greece (by gender)

Similarly, 84% of the interviewed tourists were in general dissatisfied with the way that road safety for people with mobility limitations (e.g., disabled, elderly, families with small children) is managed in the country (**Figure 61**). In all age groups, tourists who may potentially act as promoters by recommending Greece to a person with mobility limitations amount to less than 7% of respondents. The elderly group (aged over 60), being more directly affected, was expected to be more sensitive or critical with respect to problems for persons with mobility limitations. However, 83% of respondents over age 25 and 87% of young respondents found themselves to be dissatisfied with road safety for people with mobility limitations. Finally, factors affecting persons with mobility limitations seem to be slightly more frequent in Chania (86% of respondents) as compared to Athens (84% of respondents) and Thessaloniki (82% of respondents) (**Figure 62**).

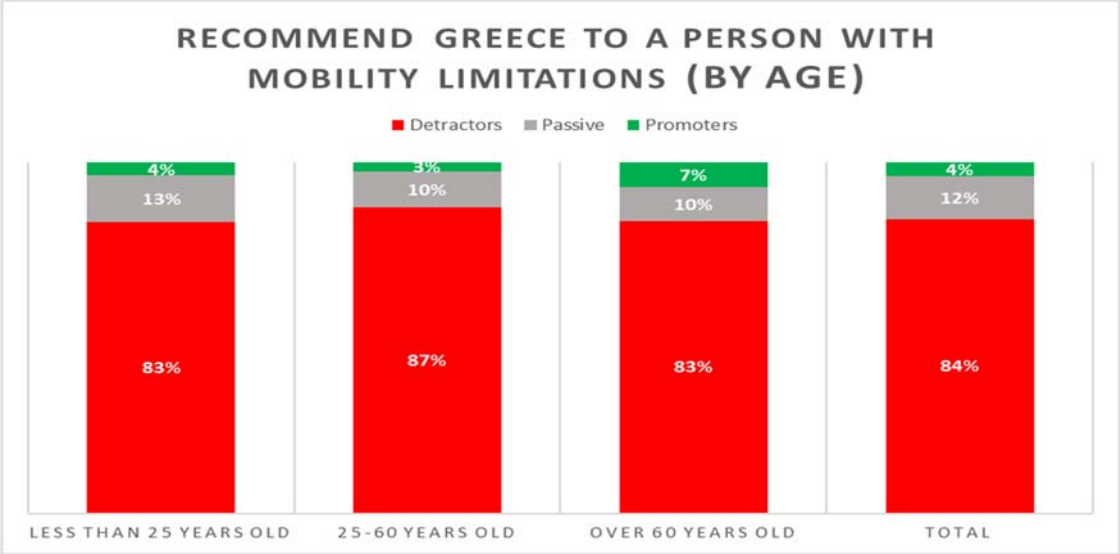



**Figure 61:** Recommend Greece to a person with mobility limitations (by age group)

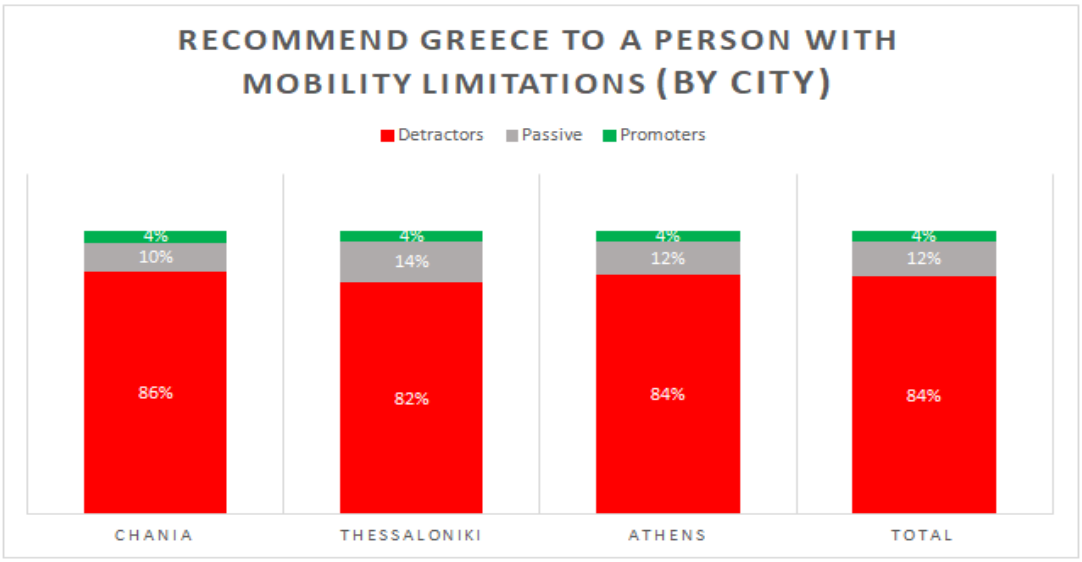



**Figure 62:** Recommend Greece to a person with mobility limitations (by city)

## 3.3 Conclusions

The main conclusions derived by the previous analysis are summarised in what follows:

- Country specific road safety information is not well communicated to international tourists. Travelers obtain this kind of information mainly from unofficial sources (e.g., relevant forums, websites, friends) and local tourism professionals rather than official sources.

- The ease of adaptation to local driving habits and culture was not a major concern for interviewed tourists. Despite the stated ease of adaptation to local driving habits and culture, a notably high percentage of respondents (41%) felt less restricted to follow the traffic code while on vacation in Greece. Young drivers, both male and female, are more inclined to non-compliance with the traffic code at almost one out of two young tourists.
- Responsible driving culture in terms of respecting the "Don't drink and drive" rule was at higher levels for those aged 25-60 (82%) as compared to elderly and young respondents (71-75%). Most importantly, a rather alarming finding was that one out of five young respondents reported non-compliance with the "Don't drink and drive" rule while driving in Greece.
- Despite the relatively high levels of non-compliance with the traffic code and the "Don't drink and drive" rule, the presence of traffic police for the purpose of supervising or enforcing compliance was not considered sufficient by 41% of respondents.
- A significant number of respondents (43%) expressed their concerns about the safety and operating conditions of road infrastructure in Greece. Safety concerns about road infrastructure are higher in Chania as compared to Athens or Thessaloniki. This can be reasonably explained by the high road accident rates and casualties in touristic regions and periods.
- More than half (55%) of interviewed tourists did not consider road infrastructure (e.g., roads, pavements, pedestrian crossings) in Greece as safe for pedestrians. Moreover, road infrastructure in Chania was found less pedestrian-friendly (64% of respondents) compared to Thessaloniki and Athens (52% of respondents in both city samples).
- Serious difficulties have been observed by the majority of interviewed tourists in relation to the friendliness of infrastructure and the use of public transport by persons with reduced mobility (e.g., disabled, elderly, families with small children). More than half of respondents found it difficult for a person with mobility limitations to enjoy walking or use public transport in Greece. These difficulties seem to be of more concern to elderly and young people rather than those aged between 25-60. On the other hand, people with reduced mobility may find increased difficulties in Crete (Chania) (69% of

respondents) and Athens (67% of respondents), as compared to Thessaloniki (57% of respondents).

- Among the various behaviors of other drivers raising safety concerns, the interviewed tourists reported mainly the following concerns: not staying in lanes (46% of respondents), dangerous overtaking (45% of respondents), speeding (45% of respondents), illegal parking (44% of respondents), not respecting road signs and priority rules (43% of respondents), as well as not respecting pedestrians (41% of respondents).
- Only 12% of the interviewed tourists found themselves satisfied with the road safety conditions in Greece, with more than half (60%) of interviewed tourists being dissatisfied. This undoubtedly compromises the overall travel experience and may negatively influence the image of the country as a safe touristic destination. The overall travel experience seems to be more negatively affected in the case of Athens and Chania as compared to Thessaloniki. In all cases, tourists that may propose driving in Greece as part of traveling experience is strikingly low (between 8% in Athens, 11% in Chania and 18% in Thessaloniki).

# 4 RECOMMENDATIONS

Based on the analysis of the tourists' road safety problem in Greece from both the accidents statistics and the travelers' perceptions points of view, this paragraph presents a set of policy and industry-wide recommendations for enhancing safe and accessible tourism. These recommendations should be considered as a basis for consultation with the stakeholders of the Greek tourism sector, so as a framework of actions to be agreed for the reduction of road casualties and the further improvement of the country's image as a "safe tourist destination".

These recommendations, however, go beyond the responsibility of national and local organisations. International and regional bodies also have a role to play in advancing safer road tourism.

Our recommendations are:

## 4.1 International Agencies

- The United Nationals World Tourism Organisation (UNWTO) – To develop a specific policy on road safety and tourism, and to
- Consider establishing a cross-stakeholder Advisory Panel on Tourism and Road Safety
- Travel and trade associations – To provide specific training and advice for members on ensuring safe road travel
- Foreign ministries and missions – To provide detailed and up-to-date information to travellers on road safety risks and safeguards for destination countries
- International and other investors in property and tourism should have road safety as a key criterion in their planning and investment decision-making

## 4.2 Greek Government and Organisations related to tourism

- Provide accessible advice for tourists on road safety risks and safeguards including key road safety laws (e.g. BAC limits, obligatory safety equipment) – for example, information offices at terminals (airports, ports, train or bus stations)
- Regularly monitor data on tourist road casualties
- Develop national tourism road safety strategy, including combined measures for the improvement of safety of road users, infrastructure and vehicles

- Support and assign scientific studies for the analysis of road safety in relation to tourism
- Take action to develop a road safety culture at national level and particularly in touristic areas

### 4.3 Local Governments (Prefectures and Municipalities)

- Develop local tourist road safety strategies, particularly targeting high risk areas
- Review pedestrian safety, particularly in zones frequented by tourists due to the high pedestrian traffic during tourist seasons
- Develop accessible mobility policies and regularly review the state of local provision
- Develop safe and accessible transport policies aimed at ensuring good standards of public and private transport services, including buses, taxis and other transport modes
- Work with regional and national governments to ensure safe road design, beginning with the identification and rectification of hazardous locations in touristic areas

### 4.4 Tourism Industry

- Trip advice and booking websites should include advice on road travel safety
- Tourist agencies and destination managers should have specific road safety policies including only using safe service providers (taxi companies, vehicle rentals, and 'experience' providers such as off-road vehicle tours), and providing clear information to tourists
- Hotel, airline and holiday chains should use their influence to encourage safe destination transport – for example by only recommending/allowing taxi, car hire or bus companies that evidently follow safe practices (e.g. use of seat belts, checking customers' driving licenses, compliance with occupational safety rules such as working hours)
- Hotels and holiday resorts should have clear information for their clients about how to keep safe on the roads, and should only use taxi and local transport companies that comply with safe standards

### 4.5 Vehicle rental companies

- When procuring vehicles, choose those with the best available safety standards including electronic stability control, ABS for motorcycles to prevent wheel-locking, Automatic Emergency Braking and other new active safety technologies
- Ensure that all motor vehicles meet applicable minimum regulations for occupant and other road users protection, with seat belts, air bags and standard active safety systems
- Check validity of customer's driving license for the desired vehicle according to the road traffic rules of the destination country
- Ensure availability of child restraints for families renting motor vehicles, and helmets for those renting 2-wheelers
- Guarantee that all vehicles are well-maintained and road worthy at all times
- Supply essential equipment such as high-visibility triangles, fire extinguishers, first aid kits and other recommended safety gear
- Supply customers with information on local road traffic rules and information on how to ensure their own safety

### 4.6 Companies and Safe Business Travel

- Prefer hotels, leasing and vehicle rental companies with good road safety practices
- Have a clear and detailed Safe Travel Policy applying to all staff setting out, in particular, requirements for wearing seat belts, not drinking and driving, and other essential safety behaviour
- Provide staff training on keeping safe on the roads
- Monitor road incidents affecting staff, identify any problem drivers and areas for attention

### 4.7 Police

- Record data on all road casualties, conforming with best practice
- Keep particular data on tourists involved in road incidents
- Identify hazardous locations, with specific reporting on tourism and road safety

- Share data at least annually with local authorities to assist with strategic development of local road safety planning
- Review enforcement policies and practices to improve road user behaviour
- Conduct regular local road safety awareness campaigns, working with local authorities, community groups and NGOs

### 4.8 NGOs

- Advocate for all stakeholders to take action on tourist road safety
- Work with police and local authorities to assist the development of road safety campaigns
- Carry out awareness raising with their target groups
- Work with universities, academics and others to assist the development of evidence based tourist road safety strategies.

### 4.9 Travelers

- To take responsibility for their own safety
- To obey local road traffic rules, and behave with at least the same care and attention to safety that they would in their home countries
- To seek information on travel safety
- Not to endanger others on the roads while travelling.

### 4.10 Need for cooperation

In producing this report, we have been persuaded of the need for a Safe Tourism Network to ensure that road safety issues, and their importance to sustainable, responsible tourism, are not forgotten. Make Roads Safe Hellas hopes to gain momentum and support for the establishment of such a network. This report, we believe, is an important step towards closer cooperation between all stakeholders in the tourism sector to achieve safer and more accessible road transport for tourists everywhere.

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