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A Speed Management Strategy for the Peloponnese

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Στρατηγική για τη Διαχείριση Ταχυτήτων στην Πελοπόννησο

Περίληψη

Η υπερβολική ή μη κατάλληλη ταχύτητα είναι ένα βασικό πρόβλημα οδικής ασφάλειας διεθνώς. Η διαχείριση της ταχύτητας έχει ως στόχο να επιτύχει κατάλληλες ταχύτητες σε όλα τα τμήματα του οδικού δικτύου και μπορεί να συμβάλει σημαντικά και άμεσα στη μείωση των θανάτων στα οδικά ατυχήματα. Στην Ελλάδα, οι παραβάσεις ταχύτητας είναι μακράν η πιο κοινή παράβαση του Κώδικα Οδικής Κυκλοφορίας. Η συνεχής αναβάθμιση του οδικού δικτύου της Πελοποννήσου συμβάλλει στην ανάπτυξη υψηλότερων ταχυτήτων στην περιοχή. Ο στόχος αυτής της εργασίας είναι η ολοκληρωμένη πρόταση για τη στρατηγική διαχείρισης των ταχυτήτων η οποία μπορεί να συμβάλει στη συνολική βελτίωση της οδικής ασφάλειας στην Πελοπόννησο. Η συγκεκριμένη προτάση καλύπτει όλες τις βασικές συνιστώσες της στρατηγικής για τη διαχείριση των ταχυτήτων, δηλαδή στόχους, τομείς δράσης, αρμόδιους φορείς και εταίρους, χρονοδιάγραμμα και πόρους, συνέργειες με άλλους τομείς πολιτικής, διαδικασίες παρακολούθησης και αξιολόγησης και θέματα βιωσιμότητας της πολιτικής.

Λέξεις κλειδιά: *διαχείριση ταχύτητας, στρατηγική, Ελλάδα, οδική ασφάλεια, Νότιο-Ανατολική Ευρώπη, ROSEE*

Abstract

Speeding is a key road safety problem in numerous countries worldwide. Speed management aims to achieve appropriate speeds on all parts of the road network and can lead to fast and significant progress in reducing road deaths. In Greece, speed infringements are by far the most common infringement of the Highway Code. The continuous upgrade of the road network of the Peloponnese supports the development of higher speeds in this area. The objective of this paper is the comprehensive proposal of a speed management strategy which can contribute to the overall improvement of road safety in the Peloponnese region in Greece. The specific proposal covers all the main components of the speed management strategy, namely objectives, action areas, stakeholders and partners, time-schedule and resources, synergies with other policy areas, monitoring and reporting procedure and sustainability issues.

Keywords: *speed management, strategy, Greece, road safety, South-East Europe, ROSEE.*

1. INTRODUCTION

In 2010, the European Transport Safety Council (ETSC), in its PIN Flash publication, included speed among the three main risk factors on the roads, the others being alcohol and seat belts. Excessive and inappropriate speed was recognised as the number one road safety problem. Speeding was found to be a primary factor in about one third of fatal accidents and an aggravating factor in all accidents (ETSC, 2010). Generally, speeding is the number one road safety problem in a large number of OECD/ECMT countries (OECD/ECMT, 2006). In Greece, speed infringements are the most common infringements of the Highway Code. In 2013, 178,816 speed infringements were recorded, almost three times the number of the second most common type of infringements (Ministry of Public Order & Citizen Protection).

Effective speed management can lead to fast progress in reducing road deaths (ETSC, 2010). This approach is also reflected in the current Road Safety Programme 2011-2020 of the European Union. Speed related issues are included in four out of the seven strategic objectives of the Programme (i.e. improved safety measures for vehicles, boost smart technology, better enforcement, a new focus on motorcyclists). Accordingly, speed issues are also addressed in the Strategic Plan for the improvement of road safety in Greece, 2011-2020. Specifically, speed enforcement is one of the components of Traffic Rules' enforcement within the proposed "Road safety enforcement" programme. In addition, a speed management system is foreseen as part of the "Safe road infrastructure" programme of the Strategic Plan. Speed is also taken into consideration in the measures proposed for specific vehicle types within the "Safe Vehicles" programme.

Within this framework, it is clear that tackling speed related problems is a priority at both European and national level. In the framework of the project titled “Road safety in South East European regions – ROSEE” of the South East Europe Transnational Cooperation Programme, a two-year multi-component speed management strategy was developed for Greece. In particular, the developed speed management strategy was focused on the area of Peloponnese which concentrates a significant population and traffic and where new motorways were recently completed contributing to the increase of speeds. In addition, this was also the area of interest of other activities completed within the project. The procedure followed included the identification of stakeholders involved in speed management in the Peloponnese and of the general road safety legislative framework, the presentation of the road safety situation in the Peloponnese in relation to speed and the development of the speed management strategy proposal including objectives, action areas, stakeholders and partners, time-schedule and resources, synergies with other policy areas, monitoring and reporting procedure and sustainability issues. The objective of this paper is the presentation of this proposal for a speed management strategy to contribute to the overall improvement of road safety in the area of Peloponnese.

2. FRAMEWORK FOR THE SPEED MANAGEMENT STRATEGY

The present speed management strategy refers to the road network of the Peloponnese, which

was the area of a pilot project in Greece completed in the framework of the ROSEE project. Within this pilot project, the road network of the Peloponnese was assessed in terms of safety and connectivity using the relevant methodology developed within the SafetyNet EU funded project. Furthermore, the exploration of the actual road safety conditions on sections of the primary and secondary road network of the Peloponnese that were not examined within the pilot project, allowed for a more complete picture of the actual road conditions in the area. The collected information allows for the development of a speed management strategy, particularly adjusted to the conditions in the Peloponnese.

Currently, several stakeholders are involved in various aspects of the speed management system in the Peloponnese. The key stakeholders and type of involvement are as following:

1. Ministry of Infrastructure, Transport and Networks:
   - Responsible for the design of highways in the Peloponnese, including the Korinthos - Patra - Pirgos - Tsakona Highway and the Korinthos - Tripoli - Kalamata Highway & Lefktro - Sparti road.
   - Responsible for the construction of certain highway sections not included in the Concession Agreements.
   - Responsible for the design and construction of specific primary roads. Responsible for setting speed limits in the national road network (primary roads), according to a specific procedure specified in the Greek legislation (Official Government Gazette (OGG) 445/14-03-2008).

2. Private Concessionaire Companies:
   The following private companies are involved in the construction and operation of highways in the Peloponnese:
   - MOREAS S.A.: construction and operation of Korinthos - Tripoli - Kalamata Highway.
   - APION KLEOS S.A. (construction) & OLYMPIA ODOS S.A. (operation): Korinthos - Patra - Pirgos - Tsakona Highway.

   The above private companies are responsible for assigning the design of the highways for construction works and for operation and maintenance of the highway projects. The designs are finally approved by the Ministry of Infrastructure, Transport and Networks.

3. Two Prefecture Authorities, the Prefecture of the Peloponnese and the Prefecture of Western Greece:
   The Departments of Public Works of the Prefecture Authorities are responsible for the construction, operation and maintenance of selected primary roads in the regional sections of their jurisdiction. Namely, the regional sections of Achaia and Ilia belong to the jurisdiction of the Prefecture of Western Greece, while the regional sections of Argolida, Arcadia, Korinthia, Lakonia & Messinia belong to the jurisdiction of the Prefecture of the Peloponnese.

4. Six Public Works Authorities, namely those of the regional sections of Achaia, Argolida, Arcadia, Ilia, Korinthia, Lakonia & Messinia:
   Responsible for the construction, operation and maintenance of, mainly, the secondary rural road network.

5. Municipal Public Works Authorities:
   Responsible for the construction, operation and maintenance of, mainly, the urban and municipal road network.

6. Traffic Police Departments:
   In general, there is one traffic police department responsible for the highways in Peloponnese, and several departments (usually one in each regional section) responsible for the rest of the primary and secondary road network.

7. Non-Governmental Organizations (NGOs):
   Numerous NGOs are involved in road safety either at a regional or at a national level.

As far as national or regional road safety strategies are concerned, in Peloponnese there is no regional road safety strategy. However, the National Road Safety Strategic Plan, covering the period from 2011 to 2020, was developed by the Department of Transportation Planning and Engineering of the School of Civil Engineering of the National Technical University of Athens and was approved in 2011. This Plan includes a specific quantitative target of less than 640 persons killed per year in road accidents in 2020, which is in accordance to the European Road Safety target to reduce the number of persons killed in road accidents by 50% during the period 2011 -2020. In the Road Safety Strategic Plan 2011-2020, relevant road safety stakeholders at a national level are defined and their relations and responsibilities are specified. In addition, specific measures for implementation are described, organized in six programmes related to education, enforcement, road users, road infrastructure, vehicles and health care. Finally, a specific framework for monitoring, evaluation and reporting of the strategy's implementation is defined. Driving at excessive or inappropriate speed is one of the road safety problems identified in the Strategic Plan and aimed to be tackled through the proposed procedures.

Furthermore, concerning road infrastructure safety management in general, the relevant European Directive DIR2008/96/EC has been adopted in Greece through the Presidential Decree 104/2011 but more specific legislation and guidelines have not been issued yet. Based on this legislation, basic principles have been defined regarding procedures related to road safety impact assessments, road safety audits, the management of road network safety and safety inspections. All these procedures are, to a more or less extent, related to speed management given that they aim to improve the conditions and make the road network safer.

For the development of the proposed speed management strategy, the above mentioned National Road Safety Strategic Plan, 2011-2020, European Directive DIR2008/96/EC and Presidential Decree 104/2011 have been taken into account, and their main principles, suitably adjusted to meet local conditions and needs, form the core of the speed management strategy for Peloponnese.

3. THE ROAD SAFETY SITUATION IN RELATION TO SPEED

According to the Traffic Police and the Hellenic Statistical Authority (ELSTAT), in Greece, during 2013, 799 road accidents with fatalities were recorded, out of which 241 were attributed to excessive speeding. Taking into account that accident causes have been defined

by the Traffic Police for only 503 accidents, almost 48% of fatal road accidents in Greece, in 2013, with a known accident cause, have been attributed to excessive speeding.

Speed infringements are by far the most common infringement in Greece. In 2012, 186,675 speed infringements were reported by the Traffic Police, in a total of 464,696 infringements (40.2%). In 2013, 178,416 speed infringements in a total of 485,184 infringements (36.8%) were recorded. It should be noted that, although there is a decrease in speed infringements, specifically -4.2% from 2012 to 2013 and -60% between 2003 and 2013, the very large number of speed infringements still reported by the Traffic Police, reveals that speeding is a quite common traffic violation in Greece.

In the Peloponnese area, in 2013, 906 injury road accidents were reported, 113 fatal, 146 involving serious injuries and 647 involving light injuries only (Table 1). The number of people killed in these accidents reached 120. The number of accidents in the seven regional sections of the Peloponnese differs considerably, with the highest number of accidents occurring in Achaia and the lowest in Lakonia. It is also noted that the regional section of Ilia, although ranking at approximately the middle, as far as the total number of accidents is concerned, was the regional section with the largest number of fatal accidents (26 accidents) in 2013.

Table 1: *Number of Accidents in the Peloponnese regions in 2013, according to accident severity*
Source: Hellenic Statistical Authority (ELSTAT)

	Accident Severity			
Regional sections	**Fatal**	**Serious Injuries**	**Light Injuries**	**Total**
Achaia	24	31	156	**211**
Arcadia	8	17	77	**102**
Argolida	17	19	74	**110**
Ilia	26	15	79	**120**
Korinthia	13	30	132	**175**
Lakonia	9	20	47	**76**
Messinia	16	14	82	**112**
Peloponnese (total)	**113**	**146**	**647**	**906**

Accident causation data in the Peloponnese are available only for fatal road accidents. Out of a total of 113 road accidents in the Peloponnese, in 2013, and 77 of them with identified accident causes, only 9 were attributed to excessive speeding. However, it should be noted that the secondary rural road network in the Peloponnese goes through villages, small towns and urban areas. Therefore, speed issues in general, constitute serious road safety concerns to local communities that try to implement appropriate speed reduction measures, usually with ambiguous results. A unified speed management strategy, systematically applied in the Peloponnese would certainly offer road safety benefits in such cases.

4. SPEED MANAGEMENT STRATEGY

4.1 Objectives

A basic approach taken into account for the development of the speed management strategy for the Peloponnese is the 'Safe System' approach (SWOV, 2006; SNRA, 2006). According to this, system-wide road safety interventions are required to address human limitations. Therefore, the following three strategic objectives are set, corresponding to the three main action areas of the strategy:

- Objective 1: Provide a road environment that supports and encourages road users to drive at safe speeds.
- Objective 2: Establish a culture which rejects excessive speeding.
- Objective 3: Use Police enforcement to control intentional excessive speeding.

In order to accomplish objective 1, road infrastructure and engineering measures are proposed, such as: setting of proper speed limits according to the category of the road and the local conditions, proper notification of road users regarding speed limits, 'self-explaining' road design, traffic calming and speed reduction measures etc.

Objective 2 can be accomplished through proper road safety education and public campaigns against speeding.

Objective 3 refers to police enforcement programs to identify and control intentionally and repeatedly speed offenders.

In the following sections, the three main action areas of the strategy are further analyzed and specific activities and measures required to achieve the aforementioned objectives are broadly outlined.

4.2 Action areas

The proposed speed management strategy for the Peloponnese includes the following three action areas, each one of them corresponding to each of the aforementioned objectives:

- Road Infrastructure and Engineering (to achieve Objective 1).
- Road Safety Education and Campaigns (to achieve Objective 2).
- Speed Enforcement (to achieve Objective 3).

4.2.1 Road Infrastructure and Engineering

The measures that are included in the 'Road Infrastructure and Engineering' action area aim at providing a road environment that supports and encourages road users to drive at safe speeds. The proposed measures are:

Setting proper speed limits

A first and very important step in any speed management system is the determination of the appropriate speed limits for the road network. According to the relevant Greek legislation

(OGG 445/14-03-2008), in order to determine the speed limits in a road section belonging to the national road network, the following data should be taken into account:

- Road Alignment (curvature, superelevation, sight distances etc.)
- Type of cross section
- Accesses and adjacent land use / Existence of Motorway Service Stations
- Intersections and Interchanges
- Accident data
- Speed measurement data
- Maintenance data

Based on the above data and according to the principles set out in the framework for speed management in the Greek national road network (NTUA, 2006), it is possible to set speed limits that are in accordance with the infrastructure characteristics and at the same time accepted by the road users.

Therefore, it is proposed that speed limit studies are assigned to evaluate existing speed limits on the national road network according to the aforementioned methodology - in several sections this has already been completed. Additionally, a more simplified version of the methodology (e.g. without speed measurement data) should be applied systematically to the secondary road network, in order to define proper speed limits in all the Peloponnese.

Speed limit signage

After determining the proper speed limits for the road network in the Peloponnese, it must be ensured that the posted speed limit is readily and efficiently understood by road users. The required speed limit signs should be installed in a conspicuous and consistent way, with particular attention to high risk sites, to approaches to urban areas and to intersection approaches.

'Self-explaining' road environment

Road infrastructure engineering should aim at providing road users with several visual cues, in addition to speed limit signs, to encourage them to drive at safe speeds. According to the 'self-explaining' road environment approach, the design of roads should not violate road users' expectations and should enhance proper driving behaviours. Therefore, the principles of the 'self-explaining' road environment approach should be taken into account for the design of new roads or the rehabilitation of existing ones in order to create a safe and user-friendly road network.

Separation of users with incompatible speeds

Coexistence of road users with significant differences in mass or speed (e.g. cars/trucks and bicycles) presents an increased risk for the most vulnerable users. Therefore, an important measure in speed management is to ensure that incompatible road users do not share the same road parts. This can be achieved for example, by designing and constructing separate paths for cyclists, at a safe distance from motorized traffic, or by providing footways especially for pedestrians.

Traffic calming and speed reduction measures

Several engineering measures are commonly used to assist in traffic calming and speed reduction, especially at the approaches to urban areas. Such measures are:

- installation of "bumps" or speed bumps and creation of bottlenecks on the road (suitable for urban areas only),

- creation (with appropriate signs giving the visual impression of entry / portal) transitional zones between rural and urban parts of the road to allow drivers to adjust their speed and be alert to deal with the new traffic conditions,
- installation of speedometers combined with variable message signs that will indicate the current speed of each passing vehicle.

4.2.2 Road Safety Campaigns and Education

In order to establish a culture which rejects excessive speeding (Objective 2), public education campaigns must be developed and implemented, to provide information and influence road users to modify their behaviour. Such campaigns seek to change behaviour and remind road users of their responsibilities by putting key road safety issues on the public agenda. These campaigns also provide information on why speed is enforced in specific ways and the benefits that can be achieved by reducing speeds on the road network of the Peloponnese.

The public communication and education campaigns should involve a variety of means (radio, TV, newspapers & magazines, leaflets in toll stations etc.) and should target the entire community, in order to achieve the desired behaviour change. The campaigns should focus on the following issues:

- inform road users about the consequences of excessive speeding, such as reduced time to realize and interpret driving related information, reduced margins to correct an error, increased accident severity etc.
- persuade road users that excessive speeding is a dangerous and unacceptable behaviour,
- inform road users that even if their speed is lower than the posted speed limit, it could be excessive if certain adverse conditions are met,
- help road users realize the necessity of speed enforcement.

In addition to anti-speed campaigns, an important aspect of road safety education should be to include road safety activities and knowledge in schools. Such road safety knowledge could include early familiarization of children with basic traffic regulations, with the identification of hazards in road traffic and with the consequences of dangerous road behaviour, such as speeding. It should be noted that the benefits of a children's road safety education program are expected to be noticeable at a time period longer than the two-year duration of the proposed speed management strategy. However, the measure is considered important for a long term, sustainable behavioural change in society and thus it is included in the proposed strategy.

4.2.3 Speed Enforcement

Speed enforcement is probably the most efficient way to control excessive speeding. Effective speed enforcement leads to a rapid reduction in deaths and injuries. A previous study in Greece has shown that the intensification of enforcement has a direct impact on the improvement of driver behaviour and attitude and subsequently on the reduction of road accident and fatalities (Yannis, Papadimitriou & Antoniou, 2008). Sustained intensive enforcement that is well explained and publicised also has a long-lasting effect on driver behaviour (ETSC, 2006). Worldwide, several speed enforcement methods are used; the automated ones (automatic speed cameras) are considered more effective because of the constant operation and the increased percentage of offenders' detection.

The following issues should be taken into account for the development of an efficient speed enforcement system:

- Road users should be aware of speed enforcement activities. This way they will have the impression that their speed is monitored and thus achieve a long-lasting effect on speed

reduction. The use of Police personnel for speed enforcement, along with automatic devices (radars, speed cameras etc.) can aid in increasing the perceived by road users speed enforcement activity.

- Speed controls and infringements should be recorded systematically, using proper equipment. During a speed enforcement activity, the number and type of all vehicles passing by the enforcement location should be recorded and not only the offenders. Speed cameras (fixed or mobile) can be very effective for this recording.
- The locations for speed controls and the duration of the speed enforcement program should be carefully selected. It is generally accepted that the effectiveness of a speed enforcement program is significantly increased, as the number of control locations and the enforcement duration increase. The control locations should cover wide areas of the road network, including urban areas, where even small reductions in speed can result in large reduction of accident severity, especially for vulnerable road users (pedestrians, bicyclists etc.). Additionally, enforcement activities should not be performed in the same location for a long time, to avoid familiarization of road users which may inhibit the results of the program.
- The results of speed enforcement activities (e.g. number of vehicles controlled, number of infringements, estimated accident reduction etc.) should be recorded and be publicly available. This will provide support to the aforementioned public education campaigns (paragraph 4.2.2) and will increase the acceptability of the speed enforcement program.

It should be noted that setting of proper speed limits and conspicuous speed limit signage is also expected to increase the acceptability of speed enforcement, because the number of unintentional speed offenders will be reduced.

In addition, based on a previous study, less urbanized and more road safety compliant regions are an easy target as far as enforcement is concerned. On the contrary, a more systematic effort would be required to achieve a more significant effect in the more urbanized and – consequently – less road safety compliant regions (offenders may believe that they can better escape controls in areas of more dense traffic and population) (Yannis, Papadimitriou, Antoniou, 2007).

4.3 Stakeholders and partners

The agencies and authorities listed in chapter 2 are the main partners that will be involved in the implementation of the proposed speed management strategy. The role and responsibilities of each partner, on the basis of the aforementioned action areas, in order to accomplish the objectives of the strategy are described below:

1. Ministry of Infrastructure, Transport and Networks:
   Implementation of road infrastructure and engineering measures on the road network of its jurisdiction (primary and selected secondary national road network).

2. Private Concessionaire Companies:
   - Implementation of road infrastructure and engineering measures on the Korinthos - Tripoli - Kalamata Highway and the Korinthos - Patra - Pirgos - Tsakona Highway, under the supervision of the Ministry of Infrastructure, Transport and Networks. Participation in public educational and awareness raising campaigns.
   - Assistance to traffic police for speed enforcement, by providing information about high risk sites etc.

3. Prefecture Authorities:
   - Implementation of road infrastructure and engineering measures on the road network in their jurisdiction (selected primary roads).
   - Development and implementation of public educational and awareness raising campaigns.
   - Development of teaching material and agenda for road safety activities and knowledge in schools.

4. Public Works Authorities:
   Implementation of road infrastructure and engineering measures on the road network in their jurisdiction (mainly secondary rural road network).

5. Municipal Public Works Authorities:
   Implementation of road infrastructure and engineering measures on the road network in their jurisdiction (mainly urban and municipal road network).

6. Traffic Police Departments:
   - Implementation of speed enforcement program.
   - Assistance to Prefecture Authorities for providing road safety education in schools.

7. Non-Governmental Organizations (NGOs):
   Involvement in public education campaigns against speeding.

4.4 Time-schedule and resources

A two-year period is considered adequate for the implementation of all the procedures and measures proposed in the strategy. Specifically, the following two-year period time-schedule is proposed for the strategy's implementation:

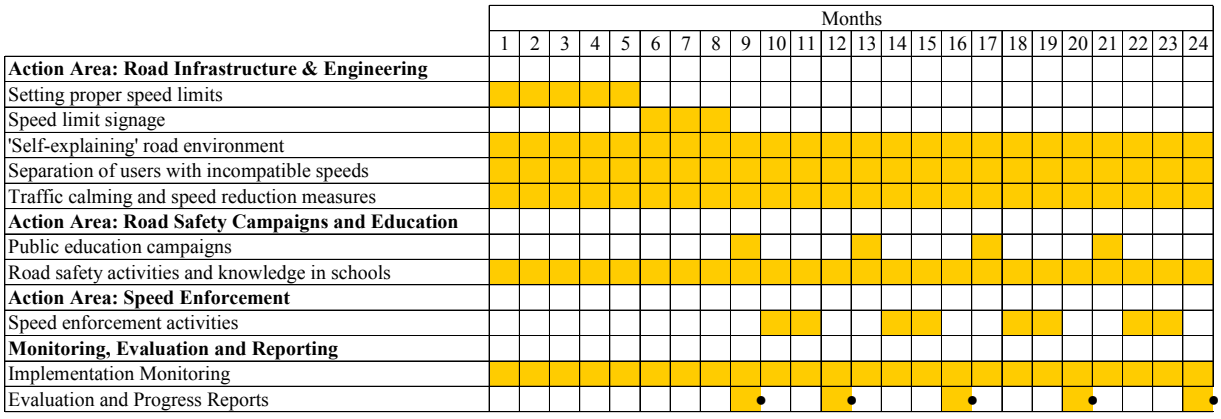

Figure 1: *Speed Management Strategy time-schedule*

The activities in the three action areas can be undertaken by the relevant stakeholders with the exploitation of resources that are normally available, i.e. the strategy implementation cost will be included in the annual budget of each stakeholder.

4.5 Synergies with other policy areas

In order to efficiently implement the strategy, the aforementioned stakeholders and partners should seek and develop synergies with other policy areas, such as those of:

- the Ministry of Education and Religious Affairs for issues related to children road safety education,
- the various Non-Governmental Organizations that can assist in organizing campaigns and events against speeding,
- Academic Institutions and Scientific Organizations, for the monitoring and evaluation of the speed management strategy's implementation.

4.6 Monitoring, evaluation, reporting

For a successful speed management strategy it is considered necessary to systematically monitor and evaluate the strategy's implementation and also periodically publish relevant reports. The benefits of a systematic monitoring, evaluation and reporting program are:

- the implementation progress and possible delays in certain action areas or specific activities are recorded, thus enabling suitable countermeasures
- relevant activities can be updated and improved, taking into account the knowledge already gained
- activities with minor road safety results can be isolated and the relevant resources can be utilized elsewhere
- publication of the strategy's road safety results increases public acceptance of the speed management activities.

The proposed monitoring, evaluation and reporting program of the speed management strategy for the Peloponnese is divided in the following sections, in accordance to the monitoring program included in the Strategic Plan for the improvement of road safety in Greece, 2011-2020 (NTUA, 2011):

1. Monitoring of the Road Safety Level.
2. Implementation of Speed Management Activities.
3. Effectiveness of Speed Management Activities.

Monitoring of the Road Safety Level

Monitoring of the road safety level is performed through the use of selected road safety indicators, at the level of Prefecture, of Regional Section (Achaia, Arcadia etc.) and at local level (municipalities). These indicators generally report on the number of road accidents or casualties, in accordance to traffic volumes. Such indicators are:

- the number of injury accidents, or damage only accidents (including road, vehicle and road user type),
- the number of people killed, heavily and slightly injured (including road, vehicle and road user type),
- the number of accidents or casualties per million vehicle.Km, the number of people killed per million inhabitants etc.
- severity indices (number of people killed per 100 accidents etc.)
- the percentage of road users driving with excessive speed etc.

Implementation of Speed Management Activities

The degree of the strategy's implementation is monitored using selected quantitative indicators, again at the level of Prefectures, of Regional Sections (Achaia, Arcadia etc.) and at local level (municipalities). These indicators allow for comparisons between the activities

implemented and the ones that should be implemented, according to the strategy's timeline. Such indicators are:

- the number and/or the length of road segments, in which speed limits were evaluated and updated,
- the number and/or the length of road segments, in which speed limit signage was improved,
- the number of engineering measures implemented, according to the 'self-explaining' road approach,
- the number of engineering measures implemented, aiming in traffic calming and speed reduction,
- the number of speed controls performed by the Traffic Police,
- the number of speeding infringements, etc.

Effectiveness of Speed Management Activities

In order to assess the effectiveness of the implemented activities, road safety studies can be based on the aforementioned data / indicators. Conclusions regarding the road safety benefits (e.g. reduction in the number of accidents, the number of people killed etc.) of a selected activity, or even an action area of the speed management strategy may thus be drawn.

4.7 Sustainability of the strategy

In order to ensure a long-lasting effect of the speed management strategy, after the two-year implementation period, it is important to involve the local communities at the maximum possible level. This has been incorporated in the development of the strategy by assigning most of the activities to local authorities (at a prefecture, regional and even municipal level), by seeking citizens support and by trying to establish a culture which rejects excessive speeding through public educational/informational campaigns and road safety activities in schools. These activities are expected to bear results for a long time after the implementation period, thus enhancing the sustainability of the strategy.

5. CONCLUSIONS

Speed is at the core of the road safety problem in Europe and worldwide. There is a strong relationship between speed, the number of accidents and the severity of the consequences of an accident (Štaba & Možina, 2014). In Greece, speeding is the most common infringement of the Highway Code and one of the key causes of serious accidents.

Most governments, worldwide, have recognised the need for action to address speeding. Speed management, which should be a central element of any road safety strategy, aims to achieve appropriate speeds on all parts of the road network (OECD, 2006).

Stakeholders to be involved in a speed management strategy include both those who hold responsibilities for speed management and those with a strong interest in speed management. Roles and mechanisms for involving stakeholders are important elements of managing programmes that address speed (WHO, 2008).

There is no single solution to the problem of excess and inappropriate speeds. A set of countermeasures is necessary, increasing the effectiveness of each individual measure.

Measures include setting appropriate speed limits, robust and visible enforcement of speed laws, infrastructure measures including appropriate facilities for vulnerable road users such as pedestrians and cyclists, road safety education and campaigns. The most appropriate combination of measures must be determined based on an assessment of the local circumstances (Štaba & Možina, 2014). Therefore, it is necessary to develop and implement a specific speed management strategy which will be based on relevant road safety data and will define all the necessary aspects of dealing with this critical road safety issue.

Given that speed management is a highly controversial issue, political support is essential for a successful programme. Political and community leaders must be informed and actively encouraged to support the speed management programme at the outset. Without this support substantial change is unlikely to occur (WHO, 2008).

Due to the generally intense problem of speeding in Greece and in combination to the recent and undergoing upgrade of the road network of the Peloponnese, speeds are already high with a great potential to increase even more. Therefore, it is necessary to act in time and proactively to avoid speeding becoming a main cause of road accidents in the area.

Moreover, the specific conditions on the road network in the Peloponnese make the network inappropriate for high speeds but, on the other hand, they favor the development of high speeds. Specifically, the road network in the Peloponnese comprises mostly of rural roads which were constructed decades ago and are characterized of serious lack of consistency concerning their geometric and traffic characteristics. These facts make it quite difficult for drivers to adjust their speed to the continuously different appropriate ones. In addition, the level of enforcement is remarkably low on the rural roads of the area which also favors the development of higher than the appropriate speeds. The adoption and systematic implementation of the proposed speed management strategy which involves engineering, education and enforcement actions on the various categories of roads in the Peloponnese has a great potential to contribute to the reduction of road accidents and related injuries in the region.

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