

ЕВРОПЕЙСКИ СЪЮЗ ЕВРОПЕЙСКИ ФОНД ЗА РЕГИОНАЛНО РАЗВИТИЕ

ИНВЕСТИРАМЕ ВЪВ ВАШЕТО БЪДЕЩЕ!





REPORT

on research, analysis, traffic safety measures developed to avoid life-threatening situation on the road and pedestrian safety system



Stage 2: Develop traffic safety measures to avoid a life-threatening situation on the road





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This report has been developed within the framework of the project "Better connected secondary and tertiary nodes to TEN-T core and comprehensive network through joint CBC measures", Project code: ROBG - 383, financed under the CBC Programme "INTERREG V-A Romania - Bulgaria" 2014-2020, co-financed by the European Union through the European Regional Development Fund. The project partners are Veliko Tarnovo Municipality, Bulgaria, Calafat Municipality, Romania and Future Today Association, Bulgaria. The main objective of the project is to improve the conductivity of the Pan-European Transport Corridors (PTC) No 4, No 7 and No 9 in the cross-border region of Bulgaria and Romania, by rehabilitating and upgrading 6,614 km of road infrastructure with proven cross-border impact and direct connection to the core infrastructure of the Trans-European Transport Network (TEN-T) and developing 3 joint mechanisms (traffic safety measures, route guidance and safety awareness campaign) to facilitate the connection of the secondary transport corridors.

A report on the survey, analysis, traffic safety measures developed to avoid lifethreatening situation on the road and pedestrian safety system in 3 phases has been created within the project activity "Implementation of traffic safety measures", with the main objective to include and implement at least one method and its applicable developed traffic safety measures to avoid life-threatening situation and pedestrian safety system on each of the following road sections:

- Str. Opalchenskaya, city of Veliko Tarnovo from the connection with the road III-514 to the connection with the road E-85 (I-5) str. Theodosii Tarnovski from the road connection from str. "Magistralna" (ROAD E772 (I-4)) to str. Dimitar Naydenov str. Dimitar Naydenov str. Theodosius Tarnovsky" to str. "Slivnitsa", str. "Slivnitsa" from str. Dimitar Naydenov to Slivnitskaya str. Kliment Ohridski, str. Kliment Ohridski from str. Slivnitsa to a new bridgehead on the Yantra River and str. Ksiliforska from a new bridgehead on the Yantra River to road III-514
- Part of road E79 within the territory of Ruzhintsi Municipality intersection of road III-114 with E-79;
- the exit from the port of Calafat to E-79, which is ul. Jui Blvd. Horia, Cloșca și Crișan, town of Cloșca. Calafat.

By implementing the developed road safety measures to avoid life-threatening situations on the road, the aim is to contribute to the implementation of the EU-wide policy to reduce road accident casualties, to conduct preventive education campaigns and to achieve one of the strategic objectives of the European Union



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White Paper on Transport: 'No road accident deaths by 2050'. This report will be shared with the local authorities and the project partners (Veliko Tarnovo Municipality /Bulgaria/, Calafat Municipality /Romania/ and Ruzhinzi Municipality /Bulgaria/), with a proposal to include and implement at least one method and its applicable identified traffic safety measures to avoid life-threatening situation on the road for each targeted road section.

A three-part report has been developed to implement the activity:

- Stage 1: Results of a survey on the traffic situation and road traffic injuries for the targeted road sections. Good practices in traffic safety.
- Stage 2: Develop traffic safety measures to avoid life-threatening situation on the road
- Stage 3: Develop a pedestrian safety system applicable to each of the targeted road sections





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I. Application of the method "Analysis of traffic accidents that have gone "off the rails""

The Traffic Safety Analysis method of "hit-and-run" crash analysis is a technique used to analyse and identify factors and situations that have caused serious incidents or fatal accidents on the roads, but have escaped with less serious consequences. This method focuses on observing cases where an accident/accident has occurred, but through a bit of luck or factors that were not fully controlled, serious consequences were avoided.



I.1. Benefits and advantages - assessment of the potential impact of implementing the measure

- Identifying risks: the method allows the investigation of cases where serious road accidents or fatalities were narrowly avoided. This helps to identify specific risks and factors that may trigger similar incidents in the future. In this way, potential hazards are recognised and measures are taken to reduce the risk.
- Prioritise safety measures: analysing accidents "in the flesh" helps to identify the most critical areas or factors that require immediate attention and improvements. This allows responsible institutions and organisations to focus



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on priority areas where the strongest safety improvement measures are needed.

- Efficient use of resources: analysing road accidents that have gone "wrong" allows municipalities and other competent organisations to focus their resources and efforts where they are most needed. This helps to make the best use of limited financial and human resources, achieving greater efficiency in improving road safety.
- Preventing future accidents: by analysing accidents that have gone "by the skin of their teeth", traffic safety measures can be targeted at preventing and avoiding future accidents. By identifying the factors and areas that led to the missed incidents, specific prevention actions are taken by introducing appropriate infrastructure, education or legal measures.
- Improving awareness and education: analysis of "near-miss" accidents can contribute to greater awareness and education of drivers, pedestrians and other road users. By communicating the results of the analysis, information about the risks and lessons learned from accidents is disseminated, helping to increase understanding and awareness of road safety.

These benefits make the Crash Analysis method a valuable tool in efforts to improve road safety and reduce the number of incidents and accidents.

I.2. Concrete steps for the implementation of traffic safety measures, through the method of "Analysis of traffic accidents gone wrong" in targeted road sections

Step 1: Data collection

- Collect data on traffic accidents that have occurred on the specific road section. This data can be obtained from the police, the road agency, or other competent organisations.
- Identify the types of accidents, the severity of damage that occurred, the number of victims, and other important case-specific details that will help the analysis.

Step 2: Analysis of accidents

• Review the data collected and identify sections of road where a significant amount of accidents or accidents with severe damage have occurred. These sections are particularly dangerous and should be the target of specific safety measures.



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- ИНВЕСТИРАМЕ ВЪВ ВАШЕТО БЪДЕЩЕ!
- Analyze the causes of accidents, including improper parking, improper passing of passengers, failure to obey traffic laws, and other factors that can lead to danger.

Step 3: Implementation of safety measures

Identify specific measures to improve the safety of hazardous sections. These measures should include:

- Installing additional traffic signs, traffic signals or fences.
- Construction of dividers or safety lanes to reduce the risk of accidents.
- Improving visibility by adding lighting or installing reflectors.
- Construct crosswalks, bike lanes, or other infrastructure changes to improve the safety of the section.

Step 4: Implementation and monitoring

- Implement the proposed safety measures and provide the necessary resources to implement them.
- Regularly check the safety of the site and collect data for future accidents.
- Analyse the results and, if necessary, adjust or supplement the type and number of safety measures implemented.

Step 5: Education and information

• Organise education and awareness campaigns to raise local awareness of road safety. This should include distributing leaflets, organising seminars and running training courses.

II. Application of the method "Traffic safety measures using roadside cameras"

The method for "Traffic safety measures using roadside cameras" involves the use of CCTV and roadside cameras to improve road safety and reduce accidents.

II.1. Benefits and advantages - assessment of the potential impact of implementing the measure



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РУМЪНСКО ПРАВИТЕЛСТВО



The traffic safety method "Traffic safety measures using roadside cameras" offers significant benefits and advantages that contribute to improved road safety and efficient traffic management. Here are some of them:

- Traffic monitoring and control: roadside cameras provide real-time traffic data and allow operators to monitor and control traffic. This allows for more effective response to incidents and violations and contributes to greater road safety.
- Identifying violations: Roadside cameras can capture violations such as improper parking, speeding, running red lights and more. This helps enforce penalties against violators and encourage compliance with traffic laws.
- Prevention: The presence of cameras on the road has a preventive effect by helping road users to be more responsible and obey the rules, as they know that they can be caught and punished for violations.
- Improving road safety: Roadside cameras contribute to improving road safety by preventing accidents and reducing the number of serious offences.
- Documenting incidents: Cameras can capture incidents and accidents, providing important data and evidence for investigations and providing accurate information on the causes of incidents.



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- Traffic management improvement: cameras provide information on traffic flow, congestion and problem areas. This allows traffic operators to take appropriate measures to optimise traffic flow and reduce congestion.
- Training and education: The footage captured by the cameras can be used for training and education campaigns to raise awareness among drivers and pedestrians about safe road practices.
- Improvement of traffic safety resources: Information from roadside cameras allows more efficient allocation of traffic safety resources, targeting the most critical areas and problem zones.

The implementation of traffic safety measures through the "Traffic Safety Measures using Roadside Cameras" method provides significant benefits to the public, drivers and pedestrians that contribute to safer and more convenient roads.

II.2. Concrete steps for the implementation of traffic safety measures through the method "Traffic safety measures using roadside cameras" in the targeted road sections

Step 1: Installation of roadside cameras

The first step is the installation of roadside cameras at strategic locations along the targeted roads - at intersections and locations with identified pedestrian concentrations. These cameras can be placed at traffic signals, traffic signs, road sites or other appropriate locations that provide coverage and surveillance of the road.

Step 2: Real-time monitoring

Roadside cameras provide real-time monitoring and recording of the road and traffic. They transmit video to control centers or operators who can track traffic and respond as needed. This allows a rapid response to hazards or incidents on the road.

Step 3: Recognition of traffic offences

Roadside cameras can be linked to number plate recognition systems and traffic offences. They can detect violations such as speeding, running a red traffic light or improper lane crossing and generate the appropriate penalties or warnings.

Step 4: Raising driver awareness

The presence of roadside cameras has a demonstrative effect on drivers, increasing their awareness and attention while driving. Drivers become more aware of the



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presence of cameras and are more likely to obey traffic laws and adhere to safe practices.

Step 5: Improving incident response

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Roadside cameras play an important role in detecting and responding to traffic incidents. They provide important evidence and information about the causes of the accident, the participants and the consequences. This helps emergency services respond quickly and provide assistance on the scene, as well as enabling future informed traffic safety management decisions.

Step 6: Data analysis and statistics

Roadside camera footage is a valuable source of traffic data and statistics. They should be collected and analysed to identify trends, problem areas, rule violations or other factors that can be improved to enhance road safety.

Step 7: Driver training and information

The use of roadside cameras can be combined with training campaigns and information materials to raise awareness and educate drivers about road safety and traffic rules.

Implementing traffic safety measures using roadside cameras leads to increased control and awareness of road users, rapid response to incidents and data analysis to improve road safety. This method is an effective way to reduce the risk of accidents and improve road safety.

III. Application of the method "Micro-analysis of traffic behaviour using cameras"

The traffic safety method "Micro-analysis of traffic behaviour using cameras" is a technique that uses surveillance cameras to analyse traffic behaviour on the road in detail. This method focuses on studving individual traffic. pedestrian movements, road users and their behaviour. This allows the identification of





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hazards, problems and opportunities to improve road safety.

III.1. Benefits and advantages - assessment of the potential impact of implementing the measure

The implementation of traffic safety measures through the "Micro-analysis of traffic behaviour using cameras" method offers numerous benefits and advantages that contribute to improving road safety and optimising transport infrastructure. Here are some of them:

- More detailed analysis of traffic behaviour: this method allows detailed analysis of the behaviour of road users, including drivers, pedestrians and cyclists. This helps to understand the causes of accidents and traffic violations, which is key information for taking appropriate improvement measures.
- Identifying risks and hazards: analysing traffic behaviour using cameras allows the identification of risks and hazards on the roads. This includes warnings of incorrect manoeuvres, unauthorised crossings, inattention and other factors that can lead to accidents.
- Infrastructure optimisation: information obtained from cameras helps to identify places where road infrastructure needs to be optimised. This could include changes to road markings, adding traffic lights, widening lanes or creating safe pedestrian areas.
- Development of warning systems: Traffic analysis can lead to the development of warning systems to alert road users to hazards or incorrect manoeuvres.
- Improved pedestrian safety: surveillance cameras can be placed at pedestrian crossings and high pedestrian crossing points, helping to facilitate pedestrian movement and reduce the risk of accidents.
- More effective education campaigns: The information from the cameras can be used to create education campaigns and information materials to increase awareness and responsibility of road users.
- Faster incident response: Cameras provide real-time traffic data, allowing faster and more effective response to incidents or accidents.
- Optimising the transport network: Traffic analysis can help optimise the transport network, leading to smoother traffic flow and reduced congestion.
- Public transport improvement: The method can also be used to analyse public transport, leading to improvements in services and safety /where applicable/.



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• Safety cost reduction: Through more efficient use of data and analysis, traffic safety costs can be optimised and targeted to the most critical areas.

The implementation of the "Micro-analysis of traffic behaviour using cameras" method provides a number of benefits and advantages that contribute to achieving higher road safety, optimising transport infrastructure and improving the quality of traffic flow. Especially in combination with other methods and measures, this approach can be very effective in creating a safer and more efficient transport system.

III.2. Specific steps for the implementation of traffic safety measures through the method "Micro-analysis of traffic behaviour using cameras" in the targeted road sections

Steps to implement the method:

Step 1: Planning and location selection

The municipality should conduct an analysis of road segments and intersections to determine the most appropriate locations to install the surveillance cameras. This includes high traffic sections, hazardous locations, or areas with specific challenges.

Step 2: Installation of the surveillance cameras

Once the location is selected, the municipality must install the surveillance cameras at the designated locations. The cameras should be placed to provide the best coverage and visibility of the road and road users.

Step 3: Building a surveillance system

The municipality should develop or install an appropriate surveillance system that allows real-time monitoring and recording of camera footage. This includes the establishment of a control and monitoring centre, operators or an automatic object and violation detection system.

Step 4: Analysis of data and traffic behaviour

The surveillance system collects video from the cameras and allows analysis of traffic behaviour. This includes studying vehicle movements, safety distances, traffic rule violations, pedestrian behaviour and other factors that can lead to risks and accidents.

Step 5: Identifying hazards and problems



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The analysis of camera data allows the identification of dangerous situations and problems on the road. This can include warnings of improper lane crossings, improper vehicle crossings, dangerous vehicle passing manoeuvres and other situations that can lead to accidents.

Step 6: Planning improvement measures

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Once hazards and problems are identified, the municipality should plan and take appropriate measures to improve road safety. This may include changes to road markings, adding traffic lights, redesigning road junctions, education campaigns and other measures.

Step 7: Implementation and monitoring

The measures taken must be implemented and monitored by the municipality concerned. This includes monitoring the effectiveness of the measures, evaluating the results and necessary adjustments or additional measures if needed.

IV. Application of the method "Implementation of good practices from specific traffic safety measures introduced and results achieved"

The traffic safety method "Application of good practices from specific traffic safety measures implemented and results achieved" is based on the study of successfully implemented measures to improve road safety and their application in other areas that also have similar challenges.



IV.1. Benefits and advantages - assessment of the potential impact of implementing the measure

- Effective use of successfully implemented measures: using best practices and successfully implemented measures from other regions or districts allows municipalities to use already proven solutions to improve road safety.
- Saving time and resources: instead of implementing new and unknown measures, the method allows municipalities to make use of proven and effective approaches, saving time and resources.



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• Improving road safety: applying successfully implemented measures from other areas helps to improve road safety and reduce the number of road accidents.

IV.2. Concrete steps for the implementation of traffic safety measures through the method "Application of good practices from specific traffic safety measures introduced and results achieved" in the targeted road sections

Step 1: Establishment of a working group

The municipality should set up a working group or team to analyse successful measures and identify best practices.

Step 2: Analysis and data collection

The working group should collect and analyse data from successfully implemented measures in other areas or regions.

Step 3: Identification of good practices

Based on the analysis, the working group identified good practices and measures that have successfully improved road safety.

Step 4: Adaptation and implementation

Identified good practices are adapted and implemented in the relevant municipality or area where road safety improvements are desired.

Step 5: Monitoring and evaluation

The final step involves monitoring and evaluating the results of the measures implemented, allowing their effectiveness to be tracked and necessary adjustments or improvements to be made where necessary.

The specific traffic safety measures implemented and the results achieved represent valuable experience that can be used by other municipalities and regions to improve the safety of the targeted roads.





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