



IRDES

Questionnaire roadside safety interventions and their effectiveness

Final Report

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1 Introduction

Following a specific request by ERANET SRO1 Programme Executive Board (PEB) a specific Work Package (WP) has been established within the IRDES Project devoted to preparing, circulating and analysing the results of a survey among the different European Road Administrations concerning the safety interventions used to improve roadside design and their estimated effectiveness.

The questionnaire was distributed to several National Road Administrations covering all European countries mainly through the Conference of European Road Directors (CEDR) in order to reach mainly national authorities in charge of the national road network.

The National Road Authority that answered the questionnaire are:

COUNTRY	
Austria	
Belgium	
Estonia	
Finland	
France	
Germany	
Iceland	
Ireland	
Italy	
Lithuania	
Luxembourg	
Malta	
Poland	
Slovenia	
Sweden	
The Netherlands	

The questionnaire is divided into four parts:

- General questions
- Roadside treatments
- Assessment of implemented interventions
- New solutions for roadsides

2 General questions

The first part of the questionnaire includes general questions about the length of the road network (divided in motorways, highways single/dual carriage and others) as well as type of roadside implemented interventions.

The overall distribution the different road types for which the responses are provided (Figure 2.1) show that the vast majority of the network considered refers to single carriageway rural highways (76%) (with only 12% referred to dual carriageway highways or motorways and 12% of other type of roads).

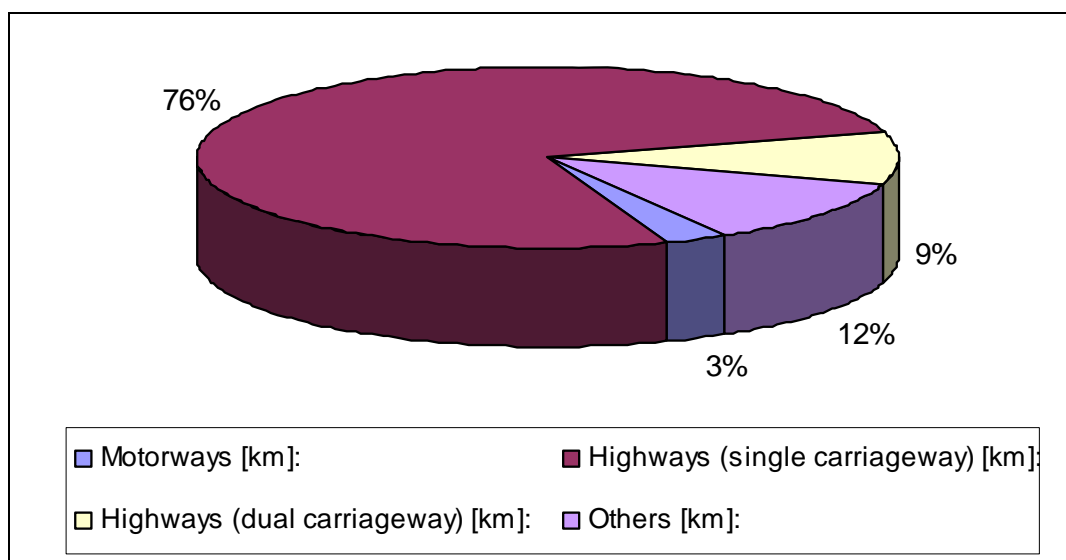


Figure 2.1: Length of network by road for all countries

3 Roadside treatments

3.1 Roadsides protected with safety barriers

One of the questions concerned the conditions in which safety barriers are used to protect the roadsides. In Figure 3.1 percentage of road network protected with safety barriers by Country and by road type is shown. In Figures 3.2 and 3.3 the use of safety barriers for protecting different road configurations (embankments, cutting, bridge roadsides and tunnel roadsides) is shown. It is interesting to note that some countries (Belgium and Sweden) always protect tunnel roadsides with safety barriers while come others (Finland and Poland) often do not protect bridge roadsides with safety barriers. .

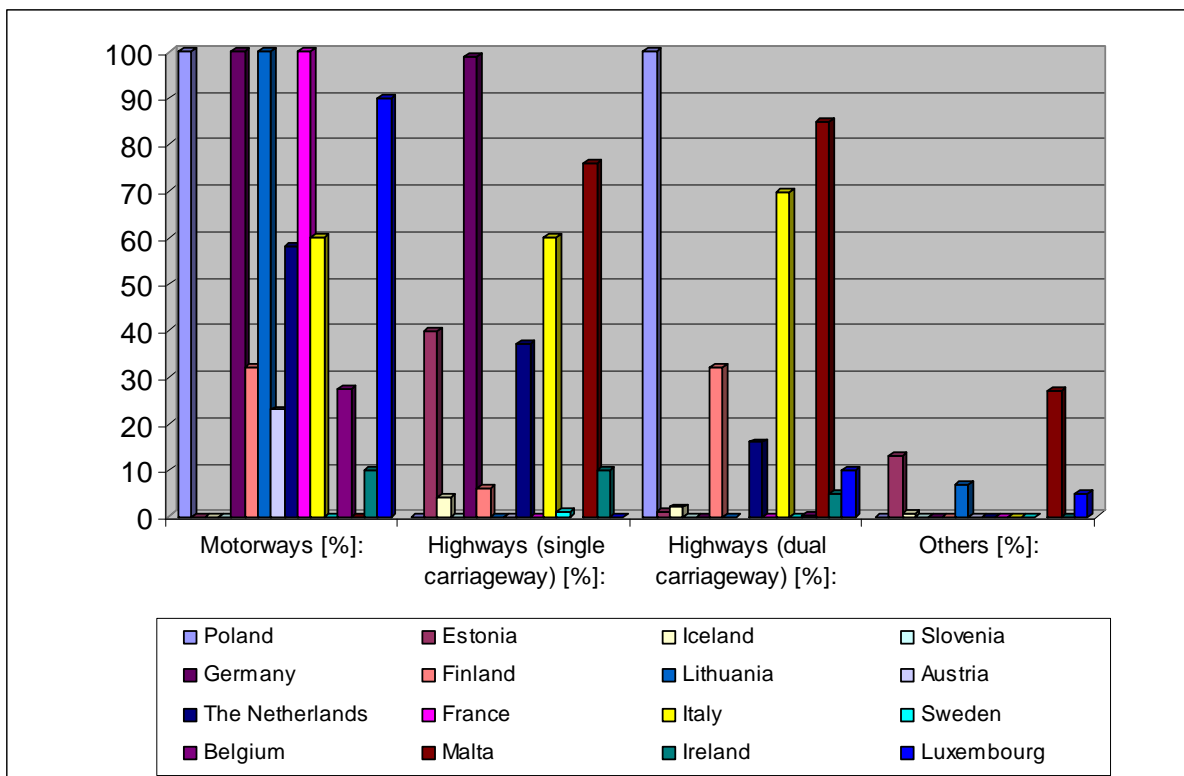


Figure 3.1: Roadsides protected with safety barriers for all countries

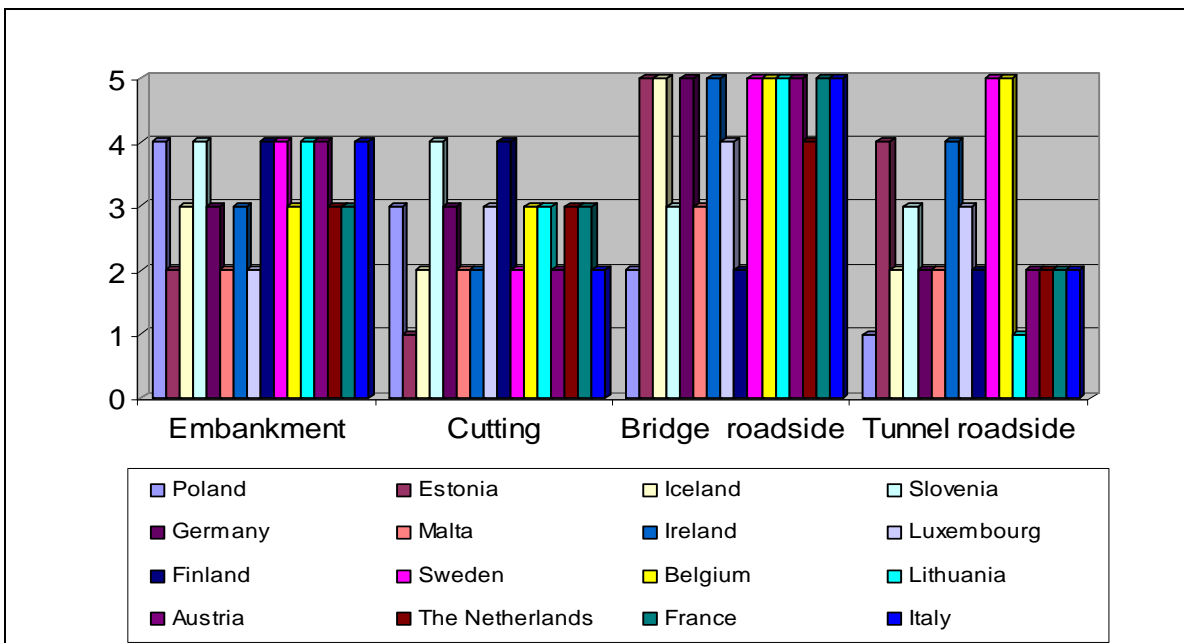


Figure 3.2: How often they are protected with safety barriers (1 never, 2 not often, 3 quite often, 4 often, 5 always)

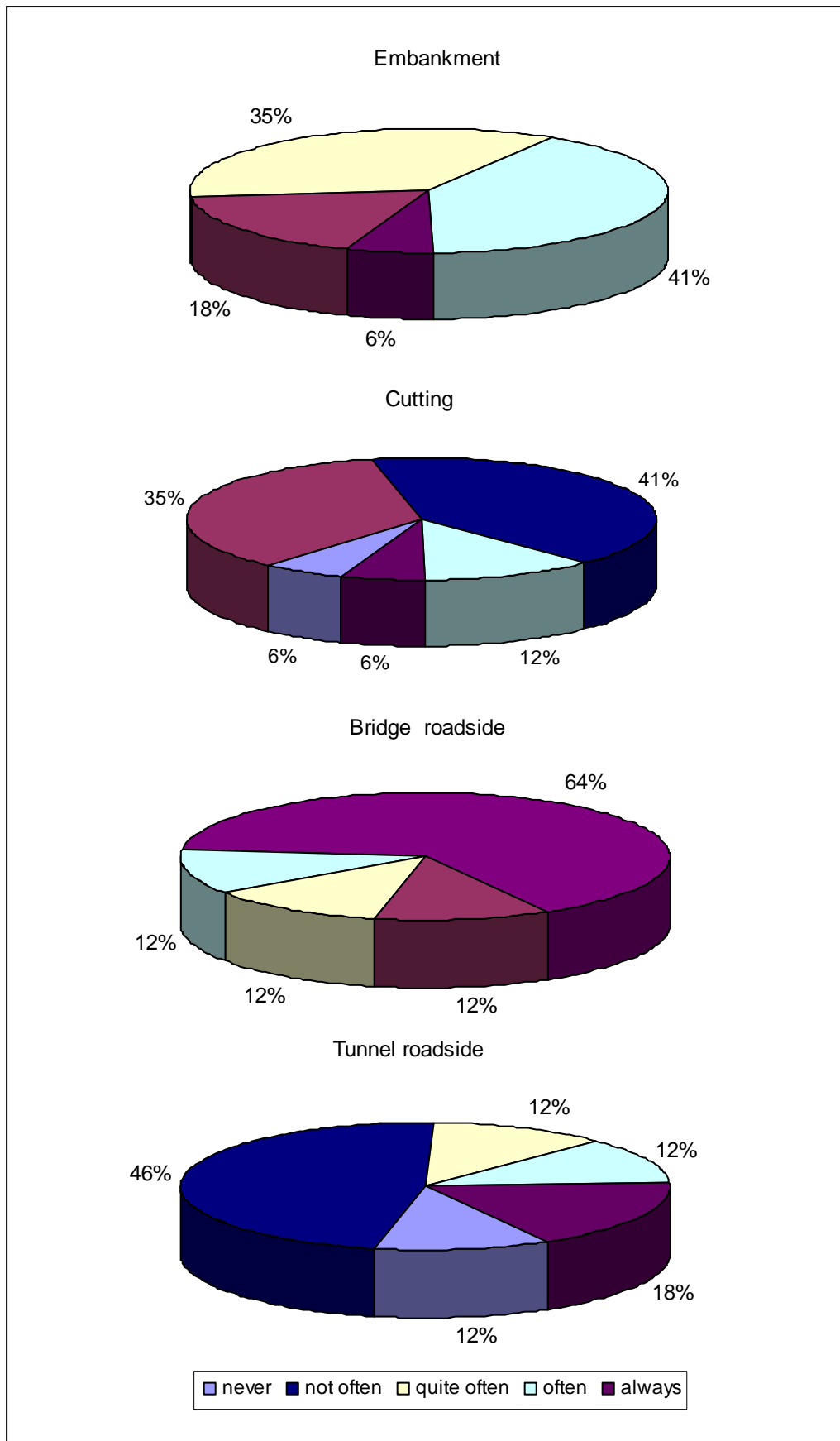


Figure 3.3: How often they are protected with safety barriers by roadsides for all countries

3.2 Horizontal signs

3.2.1 Special horizontal markings

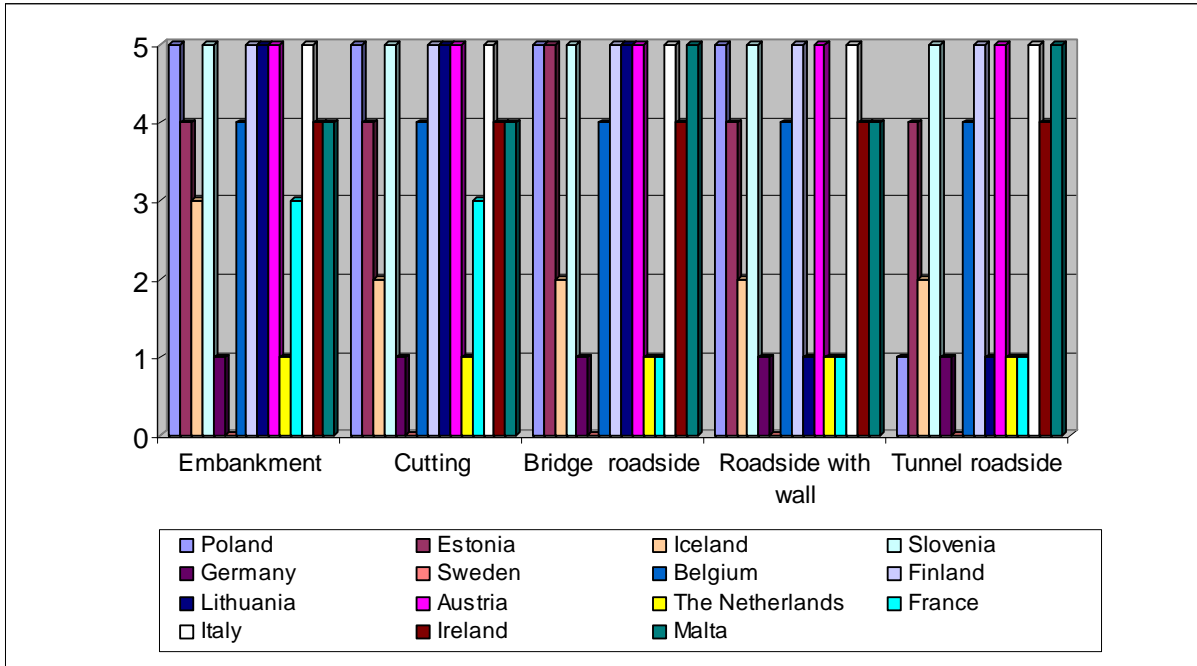
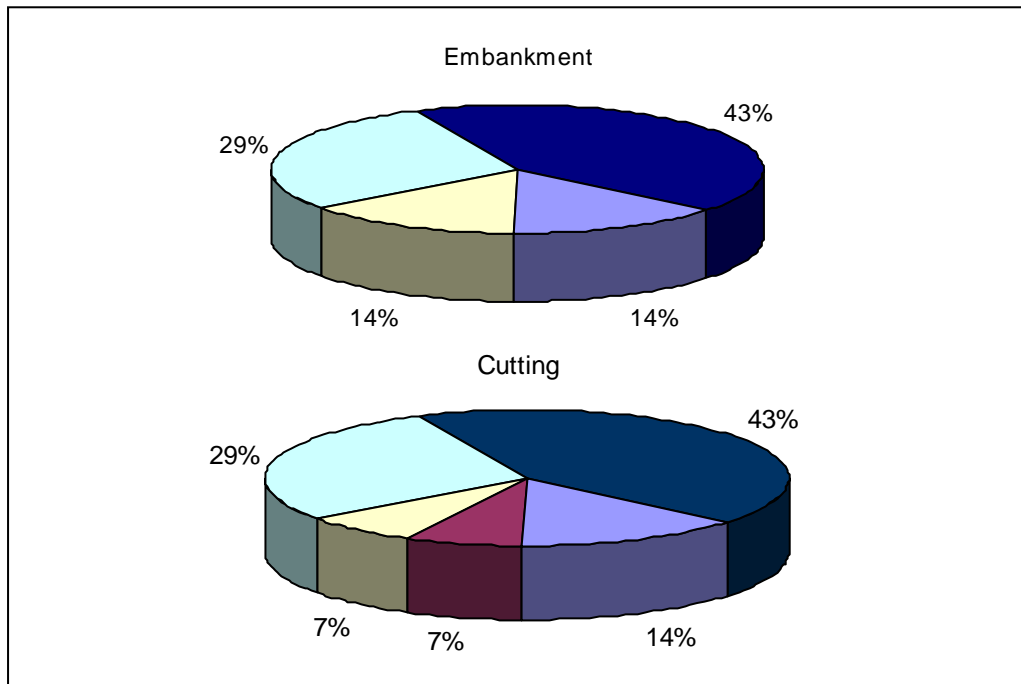


Figure 3.4: Use special horizontal markings on roadsides to prevent the use of the shoulders where there are hazards close to the carriageway/ highlight the presence of an anomaly in the section
 (1 never, 2 not often, 3 quite often, 4 often, 5 always)



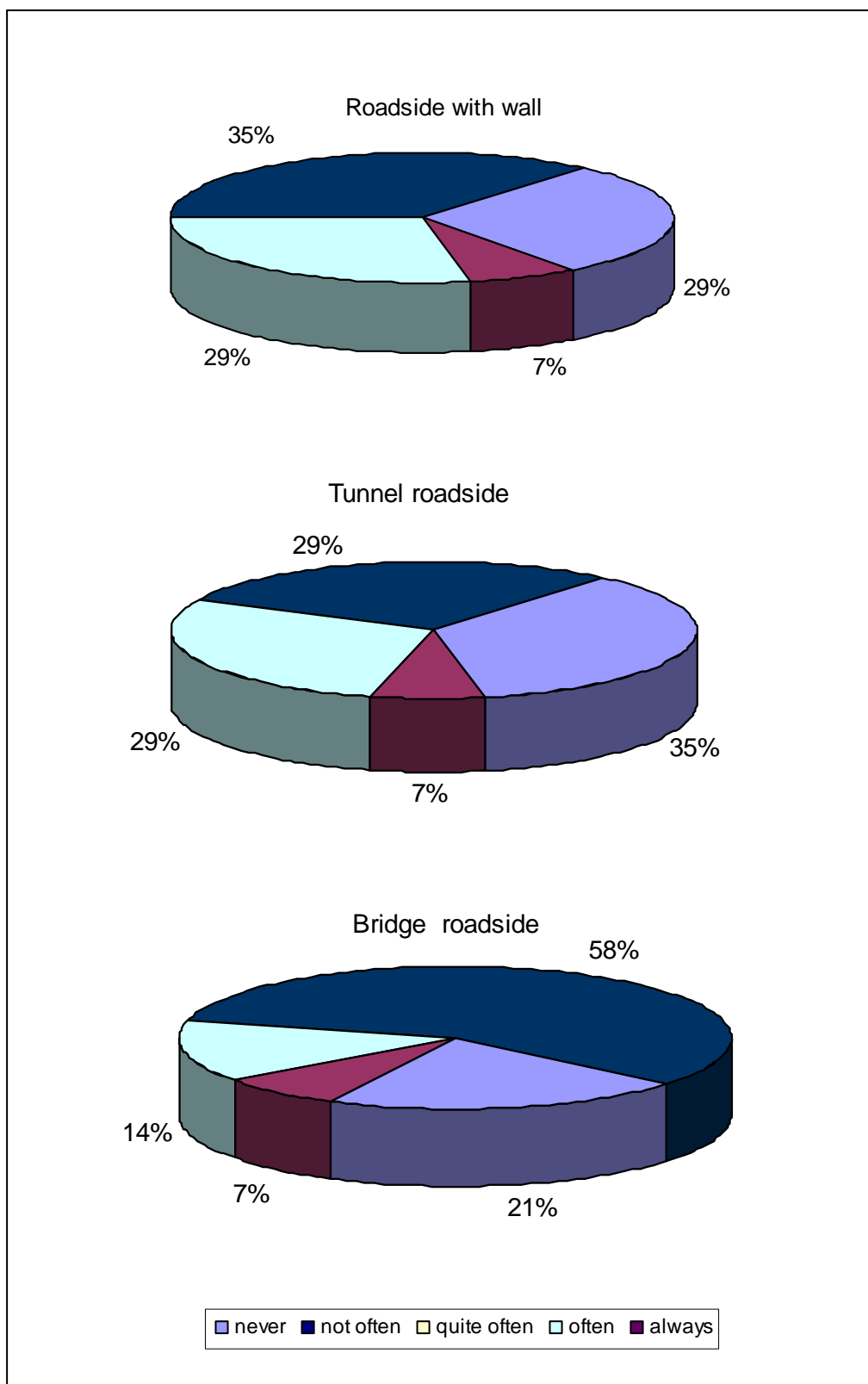


Figure 3.5: How often they are protected with special horizontal signs by roadsides for all countries

3.3 Vertical signs

3.3.1 Special vertical signs

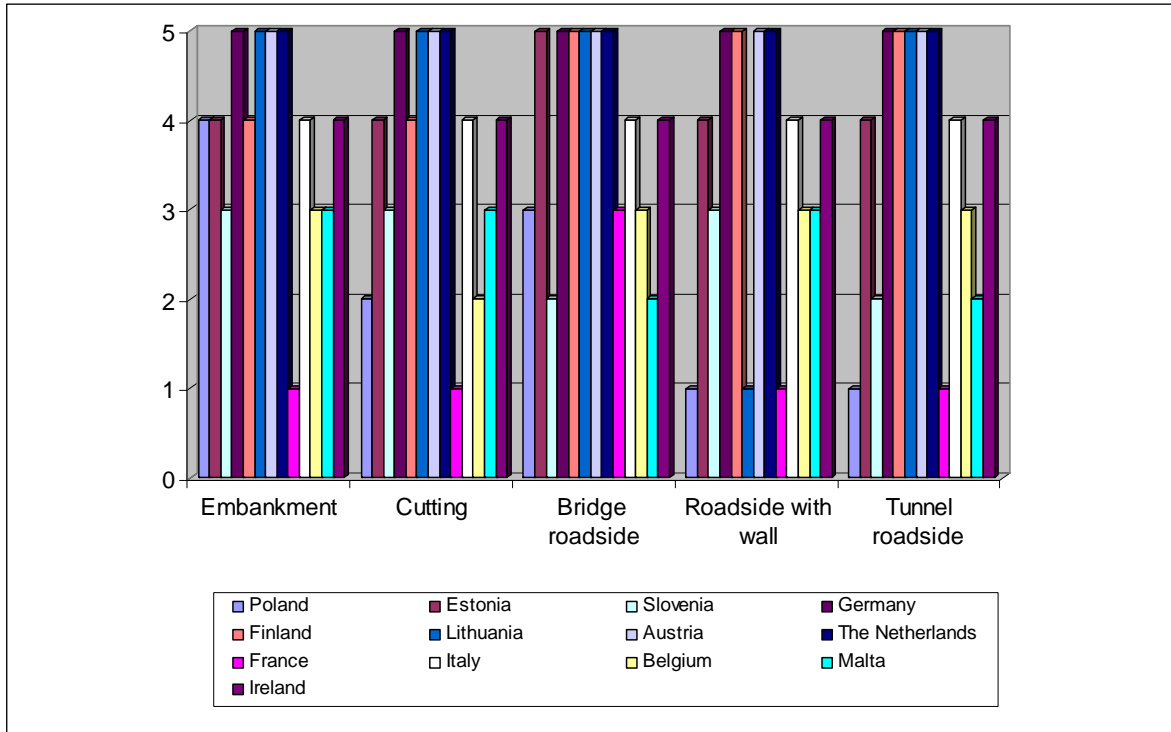
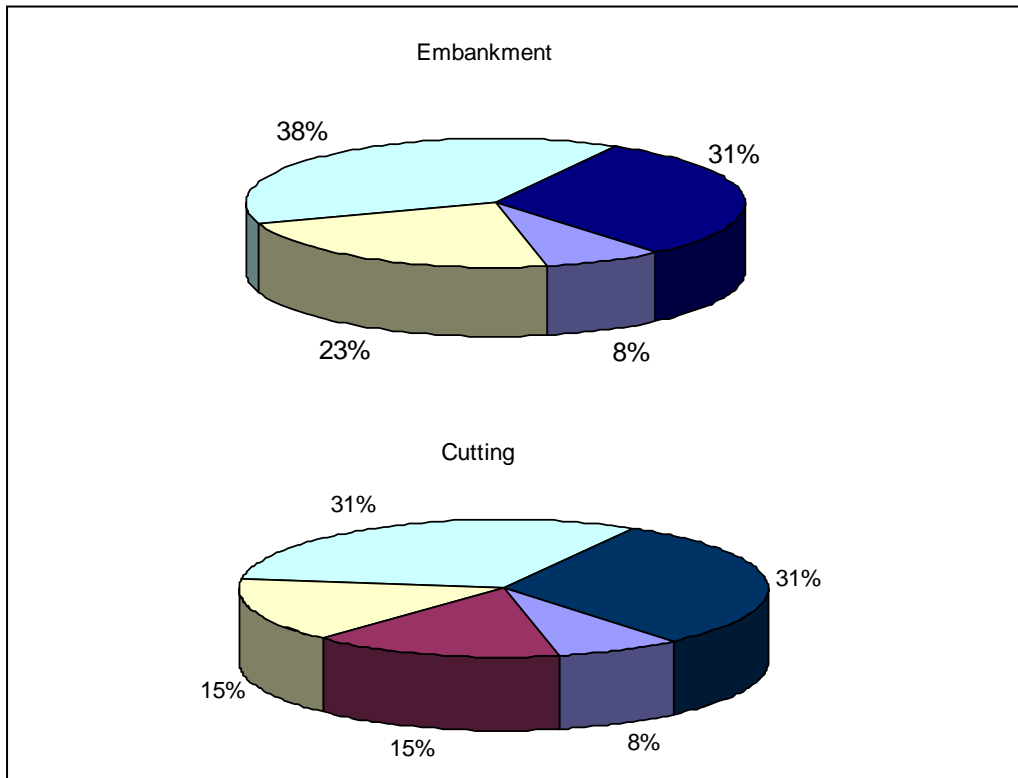


Figure 3.6: Use roadsides to highlight the road edge and obstacles
(1 never, 2 not often, 3 quite often, 4 often, 5 always)



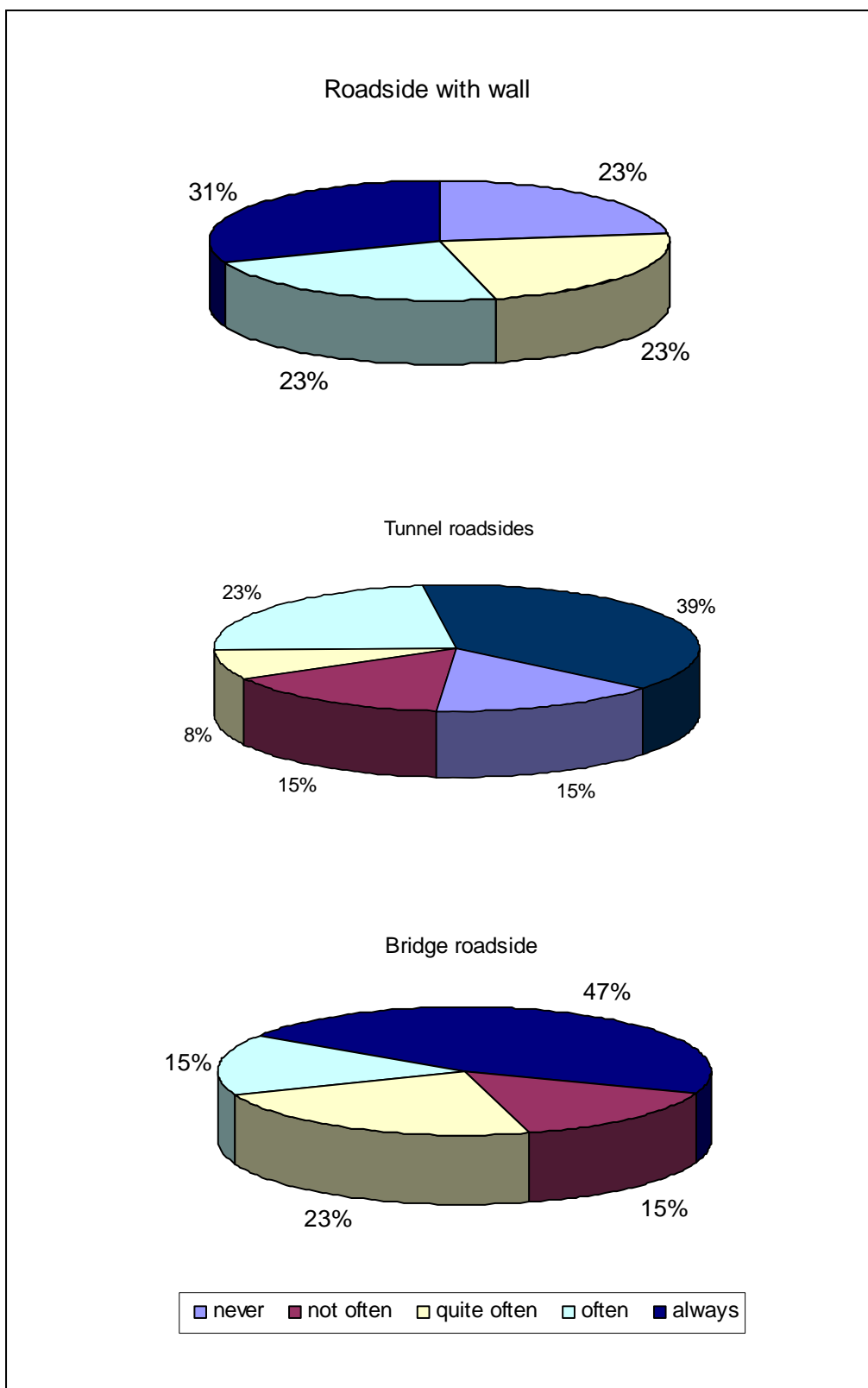


Figure 3.7: How often they are used on roadsides delineation to highlight the road edge and obstacles by roadside for all countries

3.3.2 Other vertical signs

- **Germany**, reflectors, Leds on kerbs, in tunnels;
- **Iceland**, chevrons to warn drivers of sharp bends in tunnels
reflectors on the safety barrier on bridges;
- **Ireland**, vehicle Activated Signs with associated warning signals to alert drivers to sharp bends ahead or other hazards;
- **Italy**, emergency lane, parking zones, SOS posts, high-impact sign, energy absorption system, rumble strips, in general. Special bridge barriers, wind protections, antiglare devices on bridges;
- **Luxembourg**, repetition of signs along the road, automatic detection signs “danger” with flashes.

3.4 Type of interventions predominantly in the roads

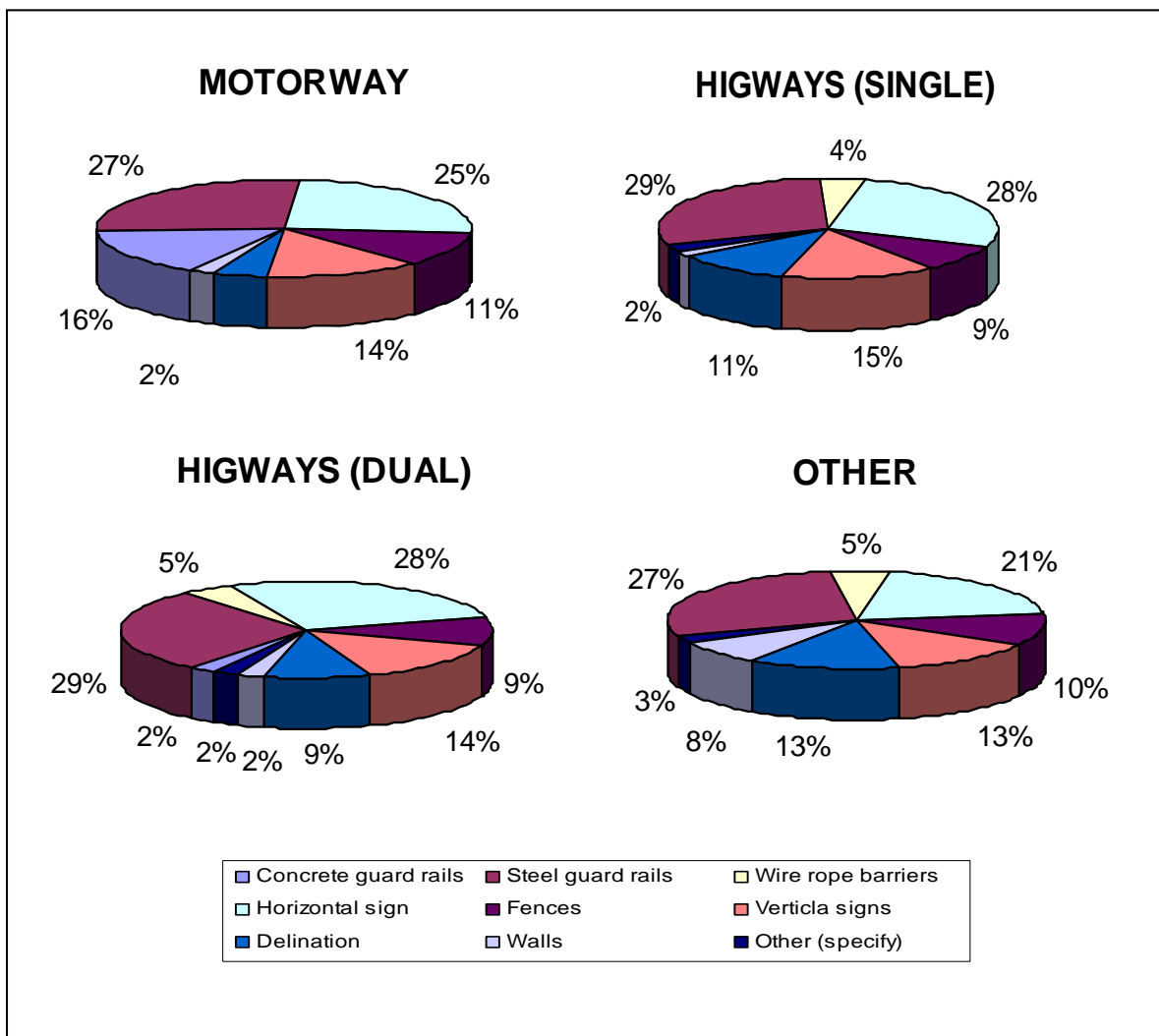
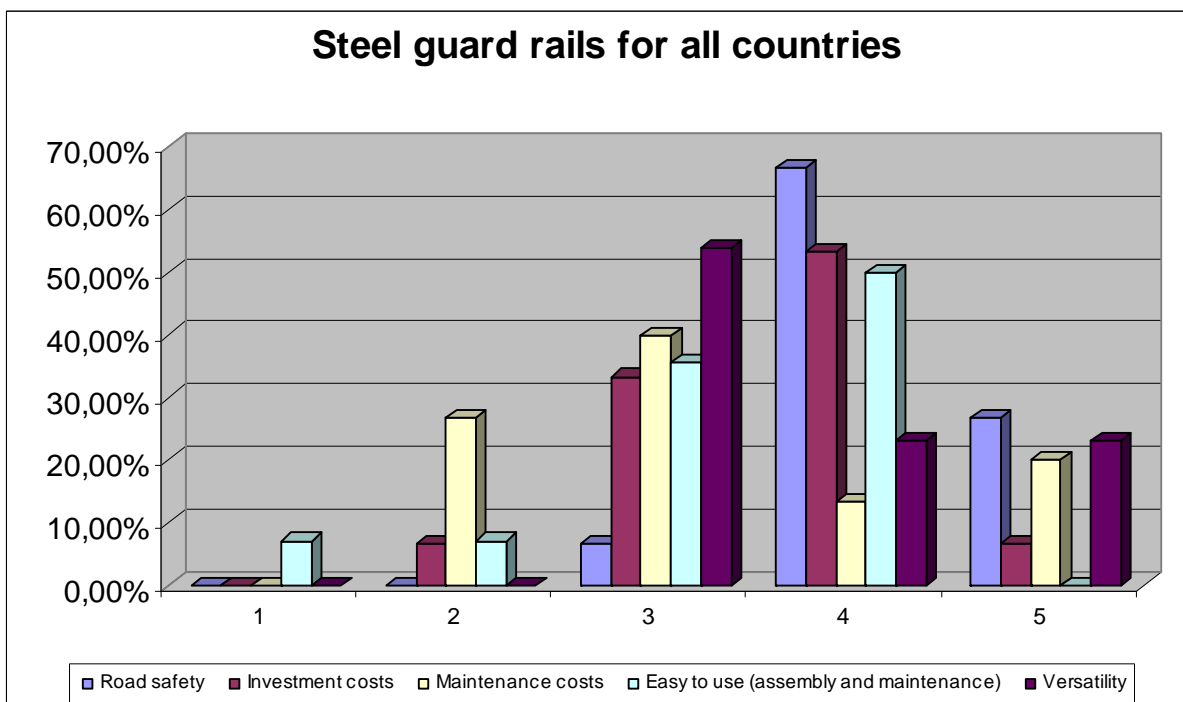
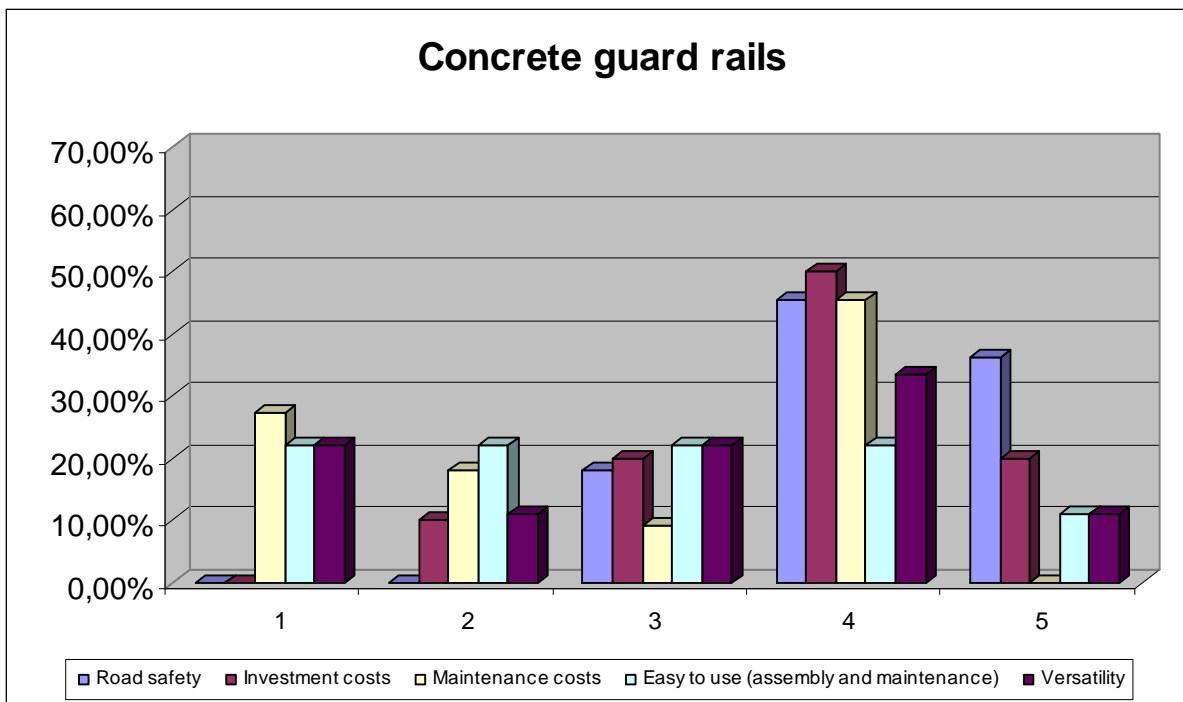


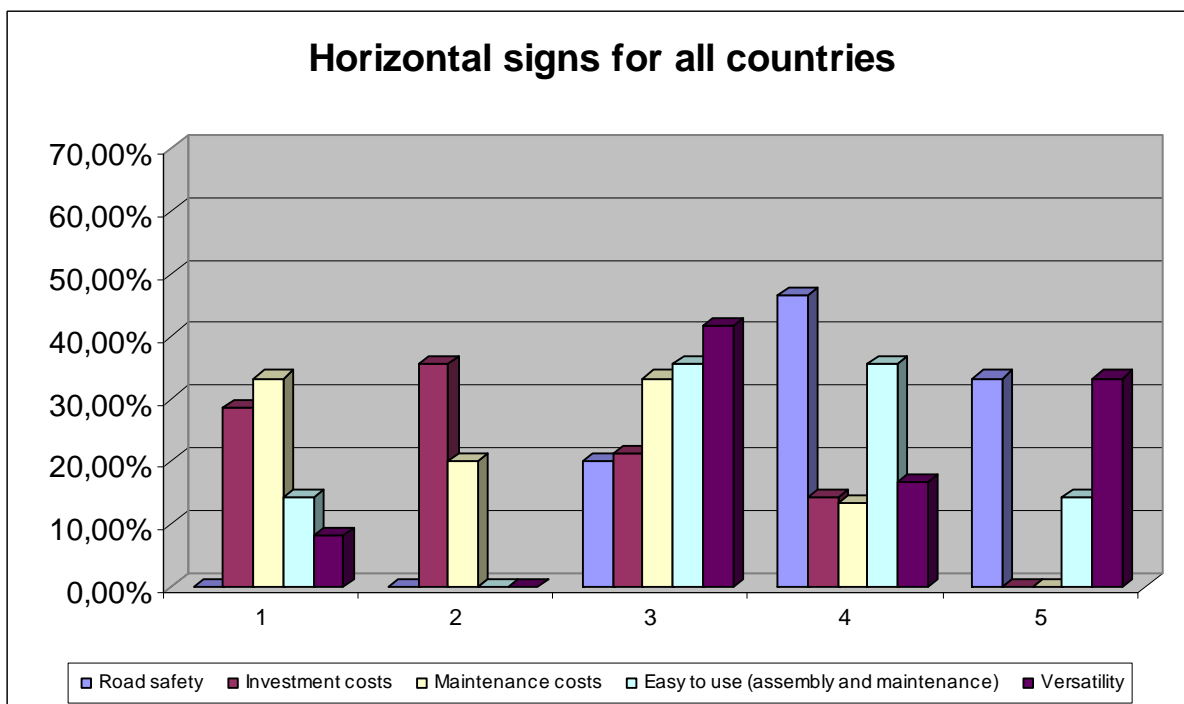
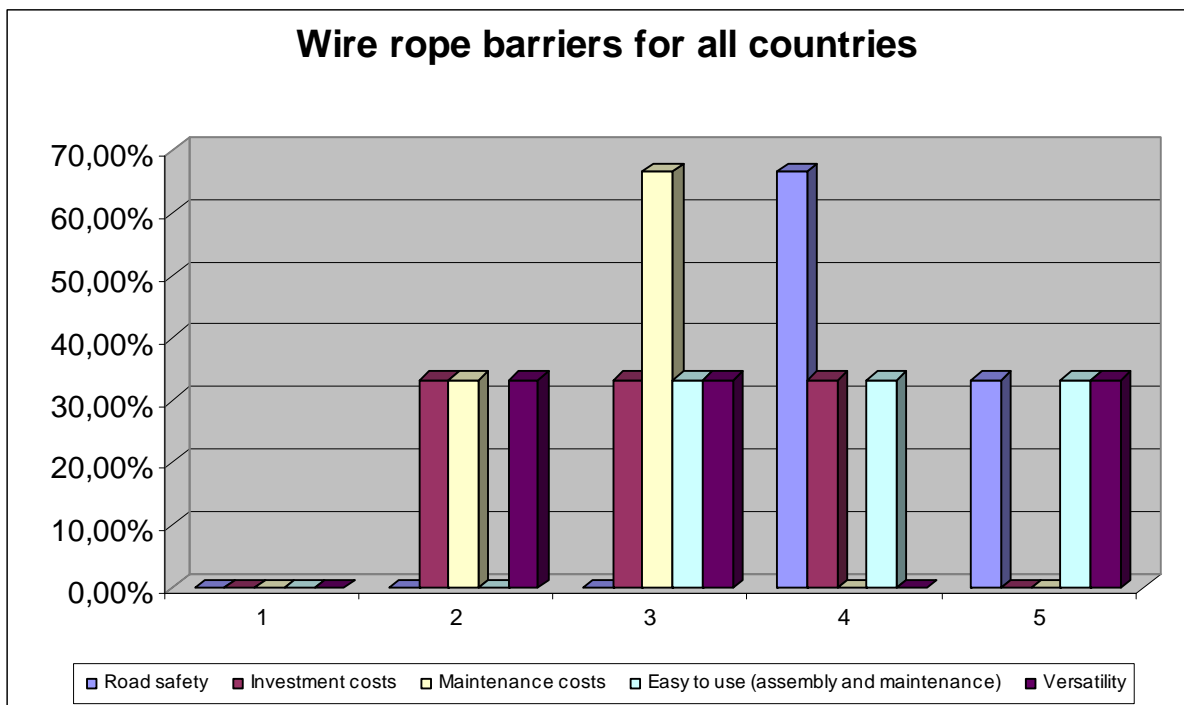
Figure 3.8: Type of intervention predominantly for all countries

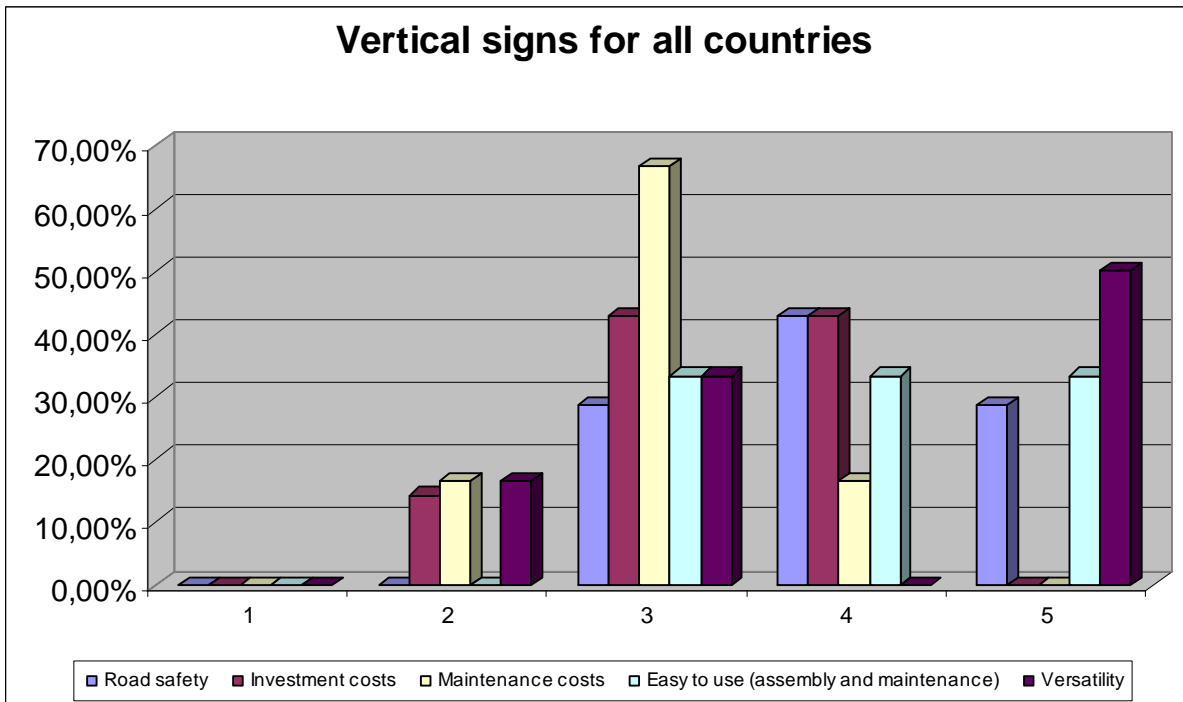
4 Assessment of implemented interventions

4.1 Type for intervention for all countries

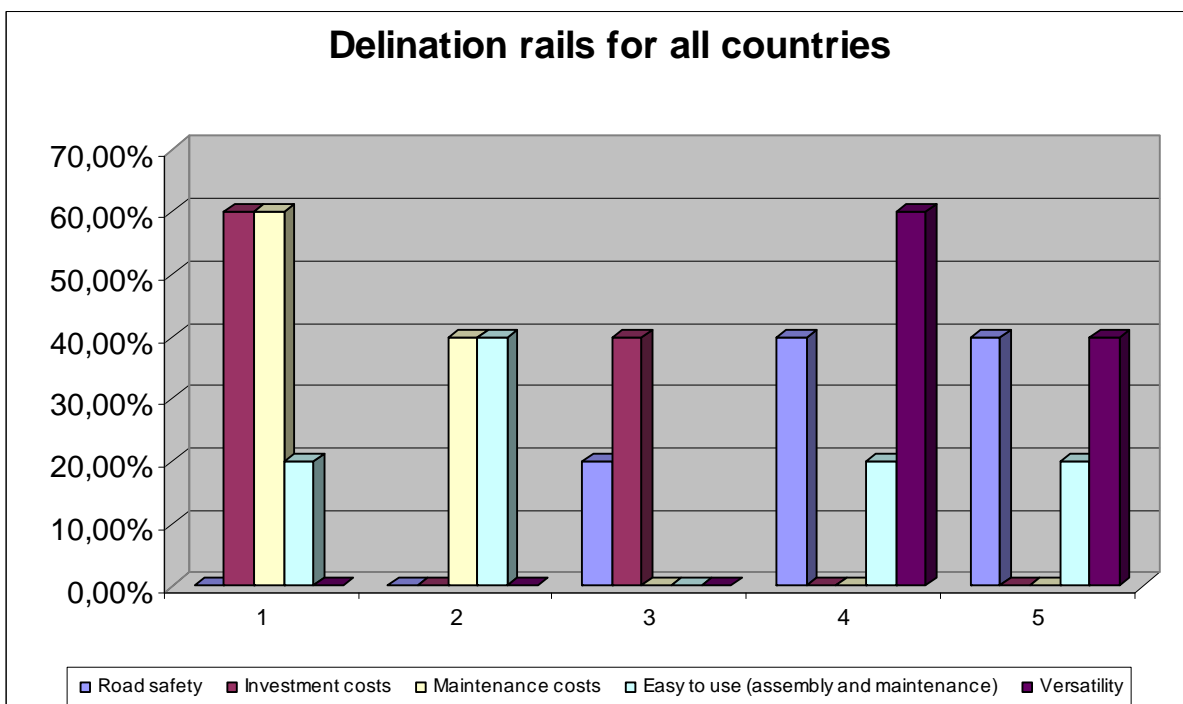
(1 low, 2 quite low, 3 enough, 4 quite high, 5 high)







1



2

¹ France, Germany, Luxembourg, Austria, Finland, Estonia, Iceland and Ireland not answered.

² Austria, Belgium, Poland, Finland, Luxembourg, Lithuania, Malta and Slovenia not answered.

5 New solutions for roadsides

In this section of the questionnaire some innovative solutions have been submitted to the attention of Road Administrations. The following systems have been considered to evaluate their effective use and the possible willingness of the Road Administrations to use them:

5.1 Breakaway devices

A sign, traffic signal or lighting support designed to yield or break when struck by a vehicle.

There are several strategies to make poles or posts “forgiving”. This can be achieved by the following modifications:

- *Material use*: The most obvious way to increase the energy-absorbance is to use materials with low stiffness. A good compromise between energy-absorbance and safety are poles made of fibreglass that absorb the energy on its entire length. The pole cracks without having a predetermined breaking point.
- *Splicing*: in order to achieve a safe breakaway, splices should be kept close to the ground.
- *Slip-base poles*: A characteristic of slip base poles is that, when impacted at normal operating traffic speeds, they are generally dislodged from their original position. It enables the pole to slip at the base and fall if a collision occurs.
- *Breakaway transformer base*: A transformer base, commonly made of cast aluminum, is bolted to a concrete foundation. The bottom flange of the pole is bolted to the top of the transformer base. The aluminum is heat-treated to make it “frangible,” so that the pole can break away from the base when struck by a vehicle.
- *Breakaway poles (with breakaway connectors)*: When breakaway poles are used, the electrical conductors must also be breakaway. This is accomplished by using special pull-apart fuse holders (breakaway connectors).



Figure 5.1: Breakaway/spliced pole (left) and slip base (right)

The use of breakaway poles, avoiding to protect them with safety barriers, is appropriate if they are small in size and in particular, as regards road signs, portal should not exceed 1 mq. In Italy fibreglass breakaway poles are also used, linked at the top by a steel cable that works as a safety connection when the pole is hit, more frequently in urban environment.

5.2 Rumble strips

A thermoplastic or grooved transverse marking with slight vertical profile which is designed to provides audible and tactile warning by the use of the ribs. It is normally located between hard shoulders and nearside travel lanes of carriageways. These are intended to help driver's attention in order to reduce the consequences of a run-off road event.

This solution, in different countries, is widely used to protect roadsides where the escaping vehicle is extremely dangerous, as for example it's used in Germany, while in Italy it's mainly used on roads with presence of fog.

The rumble strips were born as cross cuts of pavement then following with longitudinal or transverse in relief strips, but they were damaged by snow machines. Current solution consists in milling the roadside of pavement surface with variable thickness.



Figure 5.2: Example of rumble strips

5.3 False cutting

It's defined a "false cutting" a treatment of the roadside embankment that creates a ground division between the road and the external environment so that the road appears to drivers just like a cutting and as a linear artificial hill that doesn't permit to see the road itself.

The advantage of this solution in terms of safety is to move up, from the paved surface, the potential obstacles present in the roadside. Trees, noise barriers and signs are located above the embankment created by the false cutting. The side of false cutting beside the road can be equipped with continuous barrier or with a light slope (if space is available). False cutting can be obtained during construction works (or even on existing roads) expanding and erecting embankment from the end of the shoulder; on this mound of earth we can put shrubs or trees or acoustic barriers (in case of roads inside built-up areas). Inside the hill thus obtained, pipelines for rain water management and / or for treatment of air coming from vehicles can be placed. Non continuous safety barriers for this roadside are unnecessary, since the fall from embankment is impossible. Continuous barriers or redirecting profiles can increase safety provided this kind of sections.

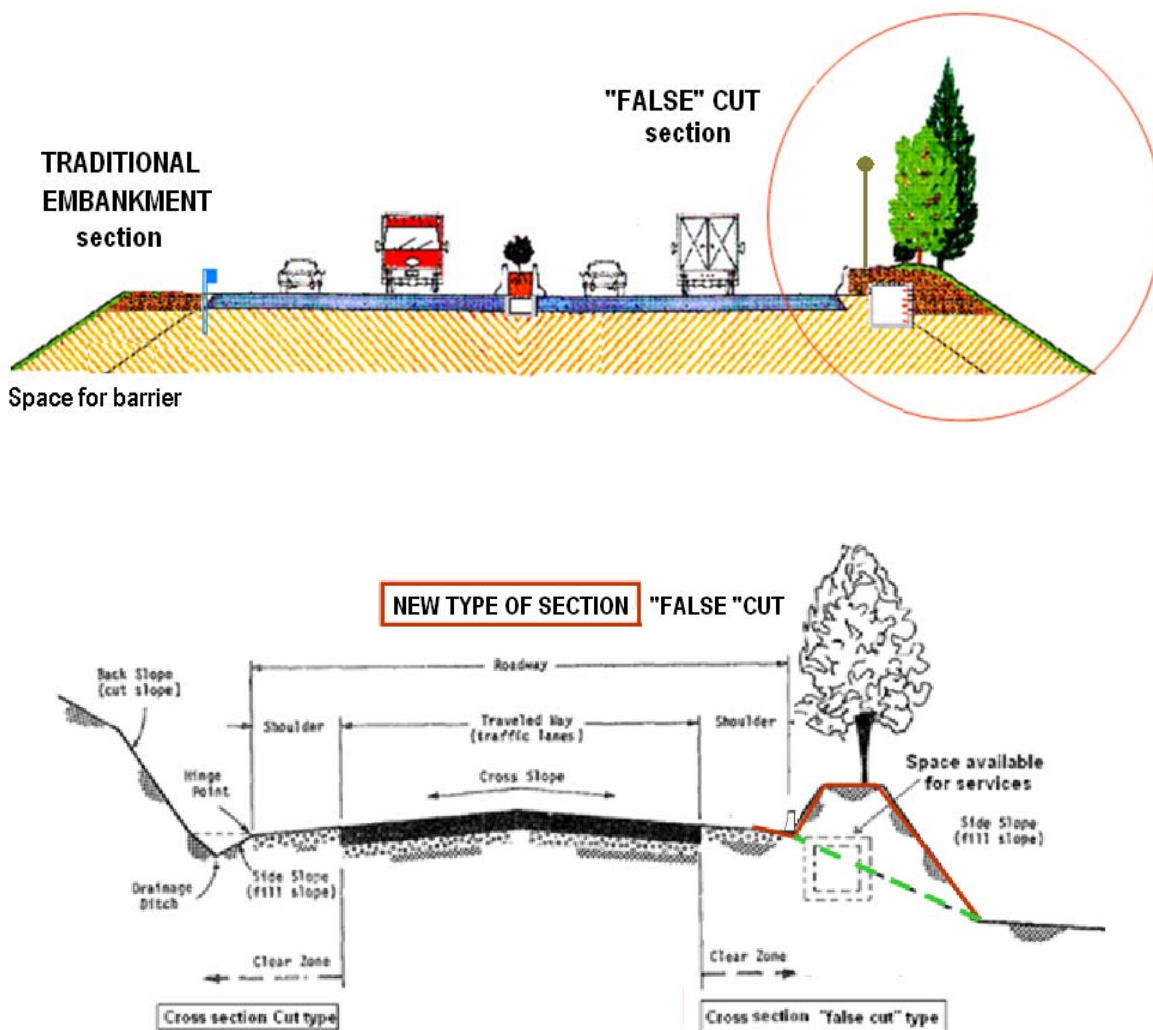


Figure 5.3: Examples of false cutting

5.4 Shape and slope of embankment slides

An embankment is a man-made ridge of earth or stone that carries a road or railway. The term comprises all kinds of sloping roadsides including cut and fill slopes. A cut slope is the face of an excavated bank required to lower the natural ground line to the desired road profile. In contrast to that, a fill slope is the face of an embankment required to raise the desired road profile above the natural ground line. How hazardous a slope is depends on its height, its steepness and its distance to the roadway edge.

5.5 Unpaved shoulder

Shoulder is the part of the roadway between the carriageway and the ditch or the (cutting or embankment) slope, which gives the carriageway lateral support. If it's unpaved means it contains very little or no paved surface immediately beyond the edge line.



Figure 5.4: Example unpaved shoulder

5.6 New developments and future systems to European Countries

Below replies, opinions and suggestions provided by Road Authorities of European Countries about innovative solutions for roadsides safety.

Austria

Austrian Road Authority is satisfied with present treatments for roadside hazards and it doesn't think new safety principles are necessary to improve the situation.

Concerning effectiveness of interventions they agree that it should be estimated according to casualty numbers and severity of injury. At present their evaluation method consists in detailed analysis of run-off accidents considering fatalities and injury accidents including detailed accident data.

Regarding new solutions, they know breakaway poles and they think their use is not necessary on motorway network but might work on rural roads with lower speeds.

They don't use and wouldn't use unpaved shoulder.

Solution of false cutting is used but not often, also implemented with draining water system and noise barrier. False cutting with air cleaning system instead is not used.

In combining guard rail with noise barrier they use both solution with concrete guard rail and solution with steel guard rail, depending on cases.

They know and use shoulder rumble strips, explaining their cost/benefit rate is good and highlighting that about 50% of fatalities comes from run-off accidents on motorways.

In addition to new roadside interventions they suggest crash cushions.

In their opinion the most used system in the future will be steel and concrete guard rails depending on the local situation.

Belgium – Walloon Region

Belgian Road Authority is satisfied with present treatments for roadside hazards, but thinks they would be improved adopting new safety principles.

Concerning effectiveness of interventions they agree that it should be estimated according to casualty numbers and severity of injury.

Regarding new solutions, they don't know breakaway poles but they would use this solution on their roads.

They know that changes in shape and slope of embankment slides can improve road safety.

They use both unpaved shoulder and false cutting, but this latest without draining water system, noise barrier and air cleaning system.

In combining guard rail with noise barrier they use both solution with concrete guard rail and solution with steel guard rail, depending on cases.

They know and use shoulder rumble strips explaining this solution help and assist the driver.

Their favorite solution is noisy painted sign and this will be also, in their opinion, the most used system in the future, especially on motorways.

Finland

Finnish Authority comments on present situation concerning roadside hazards, explaining that safe side ditch designs have been developed; lighting columns are passively safe in 100% of new installations, since year 1997, and existing columns have been modified to passively safe; vertical signs since year 2000.

They agree effectiveness of interventions should be estimated according to casualty numbers and severity of injury.

Concerning new solutions, they know and use breakaway poles like passively safe vertical sign supports and passively safe lighting columns, systems described in publications by Finnish Road Administration "Vertical sign support with passive safety, year 2005" and ht "Break-away lighting columns, current practice in Finland in 1998".

They consider changes in shape and slope of embankment slides improving for road safety.

They don't use either unpaved shoulder or false cutting. In particular they wouldn't use false cutting because it prevents snow removal.

In combining guard rail with noise barrier they use both solution with concrete guard rail and solution with steel guard rail, depending on cases.

Rumble strips are used.

They suggest safe ditch like innovative solution, as described in publication "Safety of roadside area. Analysis of full-scale crash tests and simulations", which is a final report of the analyses of both simulations conducted during the project and full-scale tests of side ditches performed in Finland and Sweden during years 2000-2001. Main objective of this analysis was to evaluate the safety of different roadside profiles, which were defined by the management group of the project. The analyses are based on data from simulations and full-scale tests.

Lithuania

Lithuanian Road Authority is pleased with present treatments for roadside hazards but thinks new safety principles are needed to improve the situation, for example making a change of current standards to new, a change of strength class for barriers and a change of using rules; removing obstacles from roadsides.

They agree effectiveness of interventions should be estimated according to casualty numbers and severity of injury. They don't have an evaluation methodology at present.

They know and use breakaway poles on Lithuanian roads as roadside markings.

They consider changes in shape and slope of embankment slides improving for road safety.

They currently don't use unpaved shoulder but they would use it for one of the most potentially dangerous driving maneuvers, the overtake.

They don't use false cutting and they are not willing to use this solution because, in their opinion, is too expensive.

In combining guard rail with noise barrier they choose solution with steel guard rail.

They use rumble strips because it's a suitable solution to attract attention and to avoid driving

on roadsides.

Among different solutions, they prefer using steel guard rails because they prevent truck collisions, protecting people, property and equipment from harm. In the future the most common systems will be steel guardrails, rumble strips, vertical and horizontal markings but also roadsides with no obstacles.

Poland

Polish Road Authority is satisfied with present treatments for roadside hazards and it doesn't think new safety principles are necessary to improve the situation.

They know and use breakaway poles on Polish roads. They consider changes in shape and slope of embankment slides improving for road safety.

They don't use unpaved shoulder but they are willing to use this solution on their network.

They don't use false cutting and they are not willing to use it.

In combining guard rail with noise barrier they choose solution with steel guard rail.

Rumble strips are used on Polish road network.

Slovenia

Slovenian Road Authority isn't satisfied with present treatments for roadside hazards and thinks new safety principles are needed to improve the situation. In their opinion, first there must be a general understanding and implementation of human factor concept into the road design. So that road would be built maintained in that vision in mind.

They agree effectiveness of interventions should be estimated according to casualty numbers and severity of injury. Their comment is that every intervention has its effect on people, by considering the human factor (perception...) as well the impact factor on human body when accident happens. The intervention should be as human friendly as possible.

They know breakaway poles but they wouldn't use this solution on their roads because it is included in proposition for modification of Technical specifications.

They consider changes in shape and slope of embankment slides improving for road safety.

They don't use unpaved shoulder but they are willing to use this solution on their network.

There is enough space to correct the driver mistake and also too wide roads can be narrowed (speed management).

They don't make use of false cuttings.

In combining guard rail with noise barrier they use both solution with concrete guard rail and solution with steel guard rail, depending on cases.

Rumble strips are used to alert drivers when crossing the edge or center line.

Future solutions aim to self explanatory and forgiving roadside, so the driver could foreseen what lies ahead and if he/she should make a mistake it could be corrected.

Malta

Malta Road Authority is not satisfied with present treatments for roadside.

About new solutions, they know breakaway poles but they wouldn't use on their roads because in most of the cases, locally there are other activities happening on the roads other than motorists. Breakaway poles can pose a hazard to other road users.

They consider changes in shape and slope of embankment slides improving for road safety.

They don't use unpaved shoulder mostly due to the limit of space on the roadsides, but they are willing to use this solution on their network.

They don't use false cutting due to the limit of space; its use has to be justified by a sound business case since implementing it might mean considerable expenses in expropriating surrounding areas of land. The false cutting also can pose an issue with available space

during reconstruction of existing roads.

Presently they are not using noise barriers.

Rumble strips are used on Malta roads because this solution enhances road safety without taking up a lot of space, it's efficient to implement and is effective.

They, however, prefer using steel barriers due to:

- easy assembly;
- flexibility and versatility;
- aesthetics when compared to concrete solutions.

Future solutions are related to the exploitation of steel in enhancing road safety systems.

Ireland

Irish Road Authority isn't satisfied with present treatments for roadside hazards and thinks new safety principles are needed to improve the present situation.

They agree effectiveness of interventions should be estimated according to casualty numbers and severity of injury; they measure reduction in collision numbers, as well as

factoring in collision costs based on 'Willingness To Pay' principle.

They know frangible devices like breakaway poles, lattix posts, breakaway lighting columns and they have used lattix posts in the past, but, due to their high cost, they are now using a framework of tubular steel which gives the same effect at much reduced cost.

They consider changes in shape and slope of embankment slides improving for road safety.

They don't use unpaved shoulder but they would use it as it gives the driver an extra safety factor in cases of driver error.

They usually don't use false cuttings; they have used them in situations where there is a difference in level between different sides of a motorway or dual carriageway, but this is the only use they make of them.

They are aware of shoulder rumble strips and they use them on both medians of their motorways, as well as the roadside edges, as they alert the drivers that they are wandering off the roadway.

A new measure they are using more and more is Vehicle Activated Signs with associated warning signals to alert drivers to sharp bends ahead or other hazards.

They are also developing a vehicle activated system to warn Ghost drivers (wrong way drivers) where they are entering the motorway in the wrong direction.

For future use, more and more ITS type developments will come on stream that they expect to be of benefit in the road safety area.

Sweden

Swedish Road Authority isn't satisfied with present treatments for roadside hazards and thinks new safety principles are needed, especially in regard to terminations and intersection/access designs.

They agree effectiveness of interventions should be estimated according to casualty numbers and severity of injury.

They know frangible devices like breakaway poles, lattix posts, breakaway lighting columns; they only use breakaway poles on new installations since 30 years.

Their experience challenge the idea of wide safety zones with smooth slopes. Their experience is that barriers are superior from a safety viewpoint. Verges are not used in Sweden but they have support shoulders which are not paved on most high speed roads.

False cutting is used on motorway medians and in roadside areas in very special situations.

Rumble strips are normally used on motorways. Single carriageway roads normally have a centre rumble strip instead.

They think barriers offer the best potential for future use and safety benefits.

Estonia

Estonian Road Authority is satisfied with present treatments for roadside hazards but thinks new safety principles are needed to improve the situation. In particular they would use more safety zones.

They agree effectiveness of interventions should be estimated according to casualty numbers and severity of injury; they evaluate this by comparison of roads with and without interventions.

They know frangible devices like breakaway poles, lattix posts, breakaway lighting columns and they think on certain situations they need to be used for safety reasons and because other solutions cannot be used (i.e. in narrow conditions where there is not enough space).

They consider changes in shape and slope of embankment slides improving for road safety.

They use unpaved shoulder but don't use false cutting because they don't see the need for it. They are aware of shoulder rumble strips but they don't use this solution because of the icing on wintertime.

They are aware of other measures:

- Shoulder rumble strips with elevated strips;
- "Drop-on-Line" marking, which is shoulder-marking with big drops of thermoplastic which form the edge-line of the road;
- Honeycomb shaped unpaved shoulder strengthening.

They appreciate "Drop-on-Line" marking, but generally they prefer using complex solutions according to the situation.

The best potential for future, in their opinion, is given by horizontal marking with rumble effect.

Iceland

Icelandic Road Authority isn't satisfied with present treatments for roadside hazards and thinks new safety principles are needed to improve the present situation. In particular, the solutions for motorcyclists are not good enough. Something has to be done to make it less dangerous for motorcyclists to collide with the pillars of safety barriers (steel guardrails and wire rope barriers).

They agree effectiveness of interventions should be estimated according to casualty numbers and severity of injury; they evaluate this by using before and after studies.

They know frangible devices like breakaway poles, lattix posts, breakaway lighting columns and they use them on their roads. According to the Icelandic Road Design Guidelines only poles that have been approved by IS-EN-12767 may be used within the safety zone. Serious accidents have happened when drivers have driven into old poles which were not approved by IS-EN-12767.

They are aware of improving road safety by changing shape and slope of embankment slides.

Unpaved shoulders are still in use on older roads. According to the Icelandic Road Design Guidelines, shoulders should be paved in general.

False cutting is not used.

They use rumble strips and the main purpose in Iceland is to make the driver alert if he is going to drive off the road or over to the lane for on-coming traffic. More than 60% of the rumble strips on Icelandic roads are used between driving directions. There is an interest in making more rumble strips but one of our problems is that they can only be "cut" into roads

with asphalt on but many of our roads are surface dressed and that kind of surface does not allow normal rumble strips.

The solution suggested is chevrons at sharp bends.

Their favorite system consists in variable message signs warning drivers when there suddenly is black-ice on the road surface. The Icelandic Road Administration operates automatic weather-stations at many spots so the data is already available.

For future use they believe that a safety zone of adequate width and road equipment which is approved by IS-EN_12767 together will give the most safety benefits.

France

French Road Authority is satisfied with present treatments for roadside hazards but thinks new safety principles are needed to improve the situation. They think that ITS could probably improve the situation.

They agree effectiveness of interventions should be estimated according to casualty numbers and severity of injury. They would better evaluate the effectiveness of barriers by

taking into account severity of injury and delineation with both casualty numbers and severity of injury.

They know frangible devices like breakaway poles, lattix posts, breakaway lighting columns and they experiment this equipment.

They are aware of improving road safety by changing shape and slope of embankment slides.

Unpaved shoulder is used but it depends on the road. Anyway it seems to be better to use a stabilized soil and to avoid grass for a better grip.

They don't use false cutting and they probably wouldn't use it because of investment and maintenance costs.

They experiment rumble strips.

The Netherlands

Dutch Road Authority isn't satisfied with present treatments for roadside hazards and thinks new safety principles are needed to improve the present situation. In particular, they create a detailed list of measures and the effectiveness of these measures. They agree effectiveness of interventions should be estimated according to casualty numbers and severity of injury.

They know frangible devices like breakaway poles, lattix posts, breakaway lighting columns and they use them on their roads.

They are aware of improving road safety by changing shape and slope of embankment slides.

Unpaved shoulder is used, false cutting not. They are aware of rumble strips but they don't use this type of intervention.

Germany

German Road Authority is satisfied with present treatments for roadside hazards but thinks new safety principles are needed to improve the present situation. Current measures are suitable for protecting hazardous roadsides. Instruments of infrastructure safety management help to identify locations where to apply these measures.

About estimation of effectiveness, road safety improvements have to fit the given accident situation, therefore an evaluation method is important. Currently such a method is being developed by bast and will be published as road safety handbook.

They know frangible devices like breakaway poles, lattix posts, breakaway lighting columns and they use them on their roads.

They are aware of improving road safety by changing shape and slope of embankment slides.

Unpaved shoulder solution is used. They are aware of rumble strips and they use this type of intervention. Pilot project with milled rumble strips of motorways showed promising results, more stretches are planned to be realized in 2011.

Usually, several potential safety measures are suitable for safety improvements. Some might be the correct choice for one situation but not suitable for the next situation. Improvements have to fit to the safety needs and the given local situation.

For future use and safety benefits, the best method consist in inducing calm driving and making roadside forgiving.

6 Conclusion and recommendations

Different versions of the questionnaire have been edited, gradually simplified, aiming to obtain relevant information to the issue of improving safety of the roadsides.

It's generally agreed that active safety involves all initiatives preventing accidents, as the run of road (ROR) of a vehicle, while passive safety involves all measures to reduce the consequences or effects from already occurred accidents.

The final version of the questionnaire was discussed and approved by CEDR board and this is the one sent to EU countries and reported in the present report.

Available data from questionnaire (16 European countries replied) compared and aggregated to identify similarities and differences, show a variable situation from one country to another, proving the common understanding that the roadsides need to be deeply improved.

The reason for variable understanding of importance of roadside could come from different legal approach which, in some countries, gives more responsibility to driver behave in comparison with others where driver or passenger must to be protected whatever dangerous is the behave. For this reason a better understanding of the influence of roadside on driving behaviour can help to find new solutions.

Table A

NEW SOLUTIONS APPRECIATED					
Solutions Country	Breakaway devices	Rumble strips	False cutting	Shape and slope of embankment	Unpaved shoulder
Austria	X	X	X		
Belgium – Walloon Region	X	X	X	X	X
Estonia	X			X	X
Finland	X	X		X	
France	X	X		X	
Germany	X	X		X	X
Iceland	X	X		X	
Ireland	X	X		X	X
Italy	X	X	X	X	
Lithuania	X	X		X	X
Malta		X	X	X	X
Poland	X	X		X	X
Slovenia		X		X	X
Sweden	X	X			
The Netherlands	X			X	X

In fact, as example, roadsides on bridges represent the most critical situation in all countries (but they're well protected), while firstly embankments and secondly cuttings require a large improvement, which needs more research to transform and get better roadsides.

Type and size of safety barriers appeared to be less important: only their presence had an effect. Then concrete and steel barriers are most used solutions, but without attention to alternative possibilities, coming from new technologies as shown in the following tables.

Such tables, named table A for appreciation of new solutions, and table B for solutions used by the countries involved in the questionnaire, together confirm this traditional vision of roadsides.

Present used indicator does not help evolution of roadsides in the right direction of a better longitudinal homogeneity along different roadsides (such as embankment, cutting, tunnel bridge) and this can suggest new paths for future research.

Table B

SOLUTIONS USED					
Solutions Country	Breakaway devices	Rumble strips	False cutting	Shape and slope of embankment	Unpaved shoulder
Austria	X	X	X		
Belgium – Walloon Region		X	X		X
Estonia	X				X
Finland	X	X			
France					X
Germany	X	X			X
Iceland	X	X			X
Ireland	X	X			
Italy	X	X	X		
Lithuania	X	X			
Malta		X			
Poland	X	X			
Slovenia		X			
Sweden	X	X	X		
The Netherlands	X				X

Apendix A

Questionnaire