

CEDR Transnational Road Research Programme Call 2016 Safety

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ADVERTS Assessing **D**istracted of **V**ehicle drivers in **E**urope
from **R**oadside **T**echnology-based **S**ignage.

Roadside advertising: an inventory of current practices and future trends

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Partners

SWOV Institute for Road Safety Research, Netherlands

Transport Research Laboratory, United Kingdom

Vias institute, Belgium



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Assessing Distraction of Vehicle drivers in Europe
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D1.1b Roadside advertising: an inventory of current practices and future trends

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Table of contents

Executive summary	6
1. Introduction	8
1.1. The ADVERTS project	8
1.2. The present deliverable.....	8
1.3. Roadside Advertising	8
2. Method	10
2.1. Europe	10
2.1.1. E-mail survey	10
2.1.2. In-depth interviews	12
2.2. Outside Europe	13
3. Results	14
3.1. Data processing and framework.....	14
3.2. Europe	17
3.2.1. Road safety criteria in European RsA guidelines/legislation	17
3.2.2. In-depth overview of RsA procedures (CEDR-PEB)	25
3.2.3. Short overview of RsA procedures (CEDR)	42
3.2.4. Short overview of RsA procedures (CEDR) – not validated	48
3.3. Outside Europe: Australia and New Zealand.....	53
4. Future trends.....	55
4.1. Approach	55
4.2. Main outcomes.....	55
4.2.1. From uncontrolled advertising to partnership with road authorities and cities.	56
4.2.2. Legislations and guidelines: lack of uniformity and not up to date	56
4.2.3. Digital billboards & roadside advertising.....	57
4.2.4. Towards Digital Out Of Home (DOOH) & multifunctionality	57
4.2.5. How can public authorities anticipate future challenges?.....	58
5. Conclusions.....	59
5.1. Permission procedure	59
5.2. Legislation.....	59
5.3. Guidelines.....	60
5.4. Future trends	60

6. Acknowledgements	62
7. References.....	63
Annexes	65
A. Current practices: e-mail survey.....	65
B. Current practices: in-depth interview	66
C. Road safety criteria for RsA in Europe	68
D. Road safety criteria for RsA in Australia and New Zealand	88
E. Future trends: semi-structured interview	93

Glossary of Terms

Billboard

Surface that displays an advertisement.

Distraction

A diversion of attention away from activities critical for safe driving toward a competing activity.

Dwell time

Total amount of time the driver fixates at an object (e.g. a billboard) when the driver passes this object.

LED-screen

Surface composed out of Light Emitting Diodes (LED). These screens emit light and on these screens advertisements can be displayed. These advertisements can be displayed for a given period of time and then digitally be replaced by another (the static digital billboards). These billboards can also display advertisements with moving images (the video billboards).

Roadside advertising

All kinds of visible expressions road users can see that promote a product, event or activity.

Static digital billboard

One light emitting screen or a light emitting screen composed out of various screens that displays a static advertisement (i.e. an advertisement in which nothing moves). This static advertisement is digitally replaced by another static advertisement after it has been displayed for a given time.

Traditional static billboard

Billboard that displays one advertisement continuously. An old advertisement has to be removed and new advertisement put up manually. Traditional static billboards can be illuminated.

Video billboard

A light emitting screen or a light emitting screen composed out of various screens that displays videos or moving animations.

Executive summary

The main objective of the ADVERTS project is to compile and disseminate recommendations for road authorities on how to deal with issues related to distraction from roadside advertising (RsA), in particular also digital advertising.

The present deliverable analyses existing guidelines and regulations on roadside advertising in a large number of countries inside and outside Europe.

Information on existing legislation and guidelines was collected by means of an e-mail survey that was sent to 26 CEDR member countries. Initial responses were retrieved from 18 countries. Subsequently all the information was processed and a draft report output was sent to the country representatives to get the information checked. This survey was completed by oral interviews of representatives from the 6 countries represented in the CEDR Programme Executive Board (PEB): Belgium-Flanders, Ireland, the Netherlands, Slovenia, Sweden, and the United Kingdom (Northern Ireland). The list was completed with readily available on-line information from Australia and New Zealand. Following this procedure, the report eventually contains a description of guidelines and recommendations as they are applied in 20 countries.

All the available information for the included countries was brought together in an overview grid. In this grid, road safety related guidelines and/or regulations for RsA were structured according to **placement** and **design** criteria. Placement criteria include longitudinal placement, lateral distance, vertical placement, orientation viewing angle and the road environment. Design criteria include movement (whether or not present), flashing lights, exposure time, transition time, quantity of information, information presentation (e.g. font sizes), colours, content, luminance (illumination), dimensions of the device and message sequencing.

The level of **detail** of covered safety related guidelines and legislation on RsA varies greatly between countries. On the one side, there are countries where guidelines are written in general, rather conceptual terms. On the other end, in some countries very detailed guidelines are available. An interesting way of presentation is found in the Netherlands where the distinction is made between essential criteria, very important criteria, and criteria for consideration.

Almost all countries have legislation in place that is related to possible safety issues associated with RsA. A majority but not all countries do complement this with a set of guidelines or recommendations for proper design and placement of RsA. Placement criteria are covered more often than design criteria in the current national legislations and guidelines. All countries cover restrictions on the placement of RsA relative to the (complex) road environment, which is often indicated in terms of specific (minimum) longitudinal distances from certain road parts/zones and/or lateral distances for different road types, where RsA is prohibited. Furthermore, a majority of the countries has defined restrictions on the dimensions, colours, content and information presentation of RsA.

A majority of the countries also deal with changeable RsA, including digital/LED billboards. Mostly this covers the motion in the advertisement, as well as exposure time and the use of flashing lights. Restrictions on the use of a sequence of displays/messages as part of a single advertisement are still rather rare (5 countries).

At least 2/3rd of the countries explicitly consider luminance (possibly causing glare) in their regulations and/or guidelines.

Some insights were also solicited from the advertising industry, in particular with respect to possible **future trends** and developments of the commercial advertisement market in the near future. Three major evolutions in the outdoor advertisement market during the last decades can be identified. The most recent evolution is a strongly increased competition of outside advertising with on-line advertising possibilities. This competition leads outdoor advertising companies to invest in Digital Out Of Home (DOOH), a flexible form of mass communication. Consequences of this on roadside billboards are:

- Increasing number of digital billboards, mainly 2m² billboards designed for pedestrians and roadside digital billboards on a few selected locations.
- Slight decrease of traditional (non-digital) billboards.
- Probable increase of low quality billboards with a poor maintenance program.
- Billboards are becoming “smart” as they can integrate sensors that collect data that is useful for smart city development.

The industry advocates more harmonized and up to date regulations and guidelines, in particular related to digital billboards. The industry is a strong supporter of European guidelines that provide attention points in function of the location of the billboard and the technology used. They point out that too restrictive legislation might impede the development of smart city applications.

1. Introduction

1.1. *The ADVERTS project*

ADVERTS is a project commissioned by the Conference of European Directors of Roads (CEDR). The main objective of ADVERTS is to compile and disseminate information for European road authorities to help inform them on issues related to distraction from roadside billboards – with a special focus on digital billboards - so that they do not interrupt the safe execution of the driving task and, as a consequence, do not disrupt traffic flow.

Distraction is one of the main challenges currently facing road transport. Distraction not only arises from sources inside the vehicle, but also from sources outside the vehicle. With respect to the latter, the increasing interest in roadside advertising via (digital) billboards is of particular interest. Some features of roadside advertising are likely to be more distracting than others.

The project is executed by a consortium of the Dutch Institute for Road Safety Research SWOV (coordinator), TRL (UK) and Vias institute (BE).

ADVERTS consists of 3 principal work packages: WP1 provides an inventory of knowledge and current practices that will be used as input to develop recommendations for good practice (WP2). WP3 takes care of benefit realisation and dissemination of the project results.

1.2. *The present deliverable*

The present deliverable analyses existing guidelines and regulations on roadside billboards in a large number of countries inside and outside Europe. It is the second deliverable in WP1 and is complementary to deliverable D1.1a that describes what has been reported in the scientific literature about distraction by roadside advertising devices and its effects on road safety.

The main focus of the present deliverable is to give an overview of existing guidelines and legislation on roadside advertisement. The report starts with a brief description of the procedure that was followed to collect and to summarize this information (Chapter 2). Subsequently the individual country results are presented and explained in detail for a number of countries (Chapter 3).

Roadside advertising is undergoing rapid changes, not the least due to increasing technical possibilities. Chapter 4 describes some future developments in roadside advertising based on an interview with an expert from the road advertisement industry.

Finally, the report presents some overall conclusions about existing guidelines and likely evolutions (Chapter 5).

1.3. *Roadside Advertising*

Roadside advertising (RsA) is defined in this report and elsewhere in the ADVERTS project as the usage of all kinds of advertising devices that are visible to road users and that are used to promote a product, service, event or activity.

We distinguish three subcategories:

- **Conventional static:** a billboard that displays one advertisement continuously that usually remains unchanged for a longer period (e.g. a few weeks). An old advertisement has to be removed and new advertisement put up manually. Traditional static billboards can be illuminated.
- **Static digital:** advertisements can be displayed for a given period of time and then digitally be replaced by another
- **Video billboard:** a light emitting screen or a light emitting screen composed out of various screens that displays videos or moving animations.

A further distinction can be made between **non-changeable** and **changeable** devices:

Non-changeable devices show a static advertisement and can only be changed manually on-site. The content of the advertisement remains the same for a certain period. This category includes mainly conventional billboards and posters, mobile/portable billboards and advertisements on street furniture and public transport shelters. These devices can be fixed on free standing structures along the road or on building walls, roofs and overhead transport infrastructure (e.g. bridges and overpasses). Sizes from conventional billboards/posters go from 4,5m² up to >50m² (Austroads, 2013).

Changeable advertisement devices can automatically or remotely change the advertising message being displayed. This allows more than one advertisement to be presented, either through the rotation of static images at specified intervals or the use of dynamic displays.

Mechanical as well as electronic systems of rotation exist. In a **mechanical** device, 2 or more static messages can be rotated in a fixed sequence at regular intervals, while the supporting structure remains stationary.

Electronic devices use digital technology to display electronic images which are uploaded and changed using a computer and modem via a network. Digital billboards use LED technology which enables luminance to be controlled and adjusted automatically to the light conditions .

Technology is now available enabling more advanced functions which allow digital billboards to interact with road users, for example by the sign displaying a personal message for a specific driver as he/she approaches.

2. Method

The inventory covers 2 main parts:

- **Europe:** inventory of current practices and existing guidelines/legislation for using/permitting RsA in the CEDR countries (i.e. national/regional road authorities; NRAs) (e-mail survey, in-depth interviews)
- **Outside Europe:** overview of road safety related criteria in RsA guidelines/legislation in different continents (literature study)

The subsequent sections shortly describe the methods applied in the 2 parts.

2.1. Europe

The inventory on European practices includes input from an e-mail survey on current RsA related guidelines and legislation amongst CEDR members and in-depth interviews on RsA practices and opinions of the CEDR Programme Executive Board (PEB) members.

2.1.1. E-mail survey

The aim of the e-mail survey of CEDR experts was to make a low-threshold personal contact with the key informants on RsA (or to identify the key informants) and to gather key documentation on guidelines, legislation and practices from the respective countries.

2.1.1.1. Participants

The PEB provided a list of people within CEDR, working in the road safety area, that have been designated as a contact point for their road authorities (CEDR Task Group Road Safety). In total, 33 experts from 26 countries received the e-mail.

We obtained responses from 18 countries (response rate = 69%). Table 1 shows the participants' country and organisation.

Country/region	Organisation
Austria	Ministry for Transport, Innovation and Technology
Belgium, Flanders	Ministry of Mobility and Public Works (MOW)
Cyprus	Department of Public Works, Ministry of Transport, Communications and Works
Estonia	Estonian Road Administration
Finland	Finnish Transport Infrastructure Agency
Germany	Federal Highway Research Institute (BAST)
Hungary	Ministry of National Development
Iceland	Icelandic Road Administration
Ireland	Transport Infrastructure Ireland (TII)
Italy	ANAS SpA
Lithuania	Lithuanian Road Administration
Luxembourg	Direction Ponts et Chaussées
Malta	Transport Government Malta
Netherlands	Dutch National Road Authority (RWS)
Northern Ireland	Transport Northern Ireland
Norway	Norwegian Public Roads Administration
Slovenia	Slovenian Infrastructure Agency (SIA)
Sweden	Swedish Transport Administration (STA)

Table 1: E-mail survey participants' country and organisation

2.1.1.2. E-mail

It was agreed within the consortium to send a brief, open and to the point e-mail, in order to maximise the response rate. After the aim and scope of the ADVERTS project, the e-mail included one main and 3 sub-questions which are considered to be easy to answer within a short timeframe:

- Do you have legislation or recommendations with regard to using/permitting Road Side Advertisement in your country?
 - o If yes, can you please send us the relevant documents and/or links, preferably in English, but if not available, in your own language. We are particularly interested in overview documents (scope and content of legislation/recommendations).
 - o If there are current developments or plans related to legislation in this area, can you please (also) send us documentation (or write a few lines) on this?
 - o If not, can you please say in a few lines what the current practices for road side advertisement are?

The complete e-mail can be found in Annex A.

2.1.1.3. Procedure

In order to maximise the response rate, the consortium agreed that Herman Moning, as PEB-chair would forward the initial e-mail and reminder to the CEDR experts.

Overview of the phased approach:

- Sending e-mail survey (Herman Moning; November 16th 2017)
- Sending reminder (Herman Moning; December 5th 2017)
- Input processing (Vias institute; January-April 2018)
- Sending proposed report output per country for additional input and verification/validation (Vias institute; April 26th 2018)
- Sending reminder (Vias institute; May 7th 2018)
- Final CEDR expert outputs and overall analysis (Vias institute; May 2018)

2.1.2. In-depth interviews

It was agreed that more detailed information would be gathered from the 6 PEB countries: Belgium-Flanders, Ireland, the Netherlands, Slovenia, Sweden, and United Kingdom. Semi-structured interviews were planned with the respective PEB experts, in order to get a more complete overview of current guidelines/legislation, procedures, organizational frameworks as well as opinions.

2.1.2.1. Participants

All PEB experts agreed to participate in the interview. Table 2 gives an overview of the participants' country and organisation.

Country/region	Affiliation
Belgium, Flanders	Ministry of Mobility and Public Works (MOW)
Ireland	Transport Infrastructure Ireland (TII)
Netherlands	Dutch National Road Authority (RWS)
Northern Ireland (UK)	Transport Northern Ireland
Slovenia	Slovenian Infrastructure Agency (SIA)
Sweden	Swedish Transport Administration (STA)

Table 2: In-depth interview participants' country and organisation

2.1.2.2. Semi-structured interview

The interviews were conducted either face-to-face or by telephone, with a maximum duration of 1h. To support the interviewers, a basic structure covering the main topics that should and could be integrated in the interview, was developed. Based on the first e-mail input the interviews could be further personalized.

The main topics covered in the interviews were:

- Background information on the sent documentation that was sent in reply to the e-mail survey
- General procedure for getting/giving a permission for RsA
- Detailed information on the prevailing road safety related guidelines/regulations for RsA
- Current practices
- Current or planned new developments regarding RsA guidelines/legislation
- Relevant experiences with digital RsA

Furthermore, personal opinions were asked:

- Can you say something about the prevailing opinions (pros and cons) about having recommendations/guidelines vs. regulation for RsA?
- To what extent do you think the industry is aware and willing to take safety related guidelines/regulations into consideration?
- Do you have particular information needs related to RsA?

The complete semi-structured questionnaire can be found in Annex B.

2.1.2.3. Procedure

Each consortium member was responsible for contacting and interviewing one or more PEB experts:

- TRL: Ireland and Northern Ireland
- SWOV: the Netherlands
- Vias institute: Flanders, Slovenia and Sweden

The interviews were recorded and each consortium partner provided the structured summary notes.

The semi-structured interview approach, rather than asking the experts to complete the questionnaire themselves, offered the opportunity to ask further information if the answers were not clear or too general.

Table 3 gives an overview of the type of interview for the different PEB country experts.

Country/region	Type of interview
Belgium, Flanders	Face-to-face
Ireland	Face-to-face
Netherlands	Face-to-face
Northern Ireland (UK)	Face-to-face
Slovenia	Phone
Sweden	Phone

Table 3: Participating PEB countries in the in-depth interview, by type of interview

2.2. Outside Europe

In addition to the detailed information acquisition for Europe, a small scale targeted inventory of road safety criteria in the guidelines and/or legislation outside Europe was done.

Readily available information for the following countries was searched on the internet:

- Australia
- New Zealand

3. Results

3.1. Data processing and framework

Based on literature (e.g. Austroads, 2013), road safety related guidelines and/or regulations for RsA can be structured according to placement and design criteria, which is also found to be a common distinction made by the national road authorities (NRAs). Based on the gathered information from the CEDR experts and international literature, we determined an extensive list of possible criteria for RsA with an influence on the safety of road users. We followed the distinction made by Austroads (2013):

- **Placement** criteria: longitudinal placement (e.g. distance from intersections), lateral distance (e.g. distance from the kerb), vertical placement, orientation viewing angle, road environment (e.g. type of roads).
- **Design** criteria: movement, flashing lights, exposure time (duration) and transition time, quantity of information (length of messages), information presentation (e.g. font sizes), colours, content, luminance (illumination), dimensions (size and shape), and message sequencing (whether RsA signs/billboards can be sequential or not).

The placement and design safety criteria integrate the SEEV model factors (see D1.1a: Vlakveld & Helman, 2018) with some overlap: some SEEV factors are covered within different safety criteria and some safety criteria integrate different SEEV factors.

As stated in D1.1a, the ADVERTS project focusses on visual attention factors based on the SEEV-model. The SEEV-factors are: Saliency, Effort, Expectancy and Value. Luminance was added because illuminated billboards can dazzle drivers.

Factors related to **Saliency** are:

- The presence of moving images or text in advertisements (movement)
- Other movement such as rotating advertisements
- Lighting, colour and contrast with background
- Exposure time of an advertisement on a static digital billboard
- Transition from one advertisement to the other on static digital billboards

Factors related to **Effort** are:

- Position of the advertisement in relation to the forward view of the driver (lateral position)
- Size of advertisement
- The visual clutter in the forward view of drivers (e.g. buildings, other billboards, and road signs that surrounds the advertisement)
- Font size of the letters on billboards
- The amount of text on a billboard
- The composition of pictures and text on a billboard
- The traffic density at the spot of the advertisement
- The complexity of the traffic situation at the spot of the billboard

Factors related to **Expectations** are:

- Do the advertisements look like road signs?
- Are the advertisements at spots where drivers search for relevant information for the safe execution of the driving task?

- Do the advertisements (partly) block the view on information that is relevant for the safe execution of the driving task?
- Does a billboard refer to information that will be on a next billboard along the road (e.g.: "See our next billboard along this road what we can offer you...")?

Factors related to **Value** are:

- Content of message, pictures and or texts that may evoke emotions
- Content related to current goals of the driver (for example food, drink)
- Text that encourage drivers to engage in distracting activities (e.g. using their mobile phone).

Factors related to **Luminance** that are not related to salience are:

- Does the illuminated billboard/object cause glare?
- Does the brightness of the illuminated billboard make unilluminated road signs almost invisible?

Tables 4 and 5 give an overview of the road authorities' safety related criteria for placement and design of RSA and the link with the corresponding SEEV factors.

Road authorities' safety criteria	Explanation	Related SEEV factor(s)
PLACEMENT		
Longitudinal placement	Restriction distances in relation to traffic control devices and driver decision and action points, as well as advertising device density constrains.	<u>Effort:</u> Position in relation to forward view; Visual clutter in the forward view of drivers; The traffic density at the spot of the advertisement; The complexity of the traffic situation at the spot of the billboard. <u>Expectations:</u> At spots where drivers search for relevant information for the safe execution of the driving task; (partly) block the view on information that is relevant for the safe execution of the driving task?
Lateral distance	Covers location relative to the edge of carriageway and off-set back from kerb etc	<u>Effort:</u> Position in relation to forward view.
Vertical placement	Maximum and minimum height and overhead placement	<u>Effort:</u> Position in relation to forward view.
Orientation viewing angle	Rotation relative to the carriageway geometry and/or passing vehicle	<u>Effort:</u> Position in relation to forward view.
Road environment	Covers restriction placement relative to the road environment (speed limit, speed environment, roadside environment, etc..)	<u>Effort:</u> Visual clutter in the forward view of drivers; Traffic density at the spot of the advertisement; Complexity of the traffic situation at the spot. <u>Expectations:</u> Are the advertisements at spots where drivers search for relevant information for the safe execution of the driving task?

Table 4: Overview of NRA placement safety criteria for RSA linked to the SEEV factors

Road authorities' safety criteria	Explanation	Related SEEV factor(s)
DESIGN		
Movement	Covers presence of motion in the advertisement (video, special effects, transition types: movement or rotation between successive displays)	<u>Saliency:</u> Moving images or text in advertisements; Rotating advertisements.
Flashing lights	Use of flashing, blinking, revolving, pulsating or intermittent lights	<u>Saliency:</u> Lighting, (colour and contrast with background);
Exposure & transition time	Exposure time (how long an ad is in-view), also referred to by message display duration; duration of the transition between ads...	<u>Saliency:</u> Exposure time of an advertisement on a static digital billboard; Transition from one advertisement to the other on static digital billboards.
Message sequencing	Use of a sequence of displays/messages as part of a single advertisement	<u>Expectations:</u> Refers to information that will be on a next billboard along the road?
Quantity of information	Message length, quantity of text, number of elements	<u>Effort:</u> Amount of text.
Information presentation	Layout, font, size, spacing, etc.	<u>Effort:</u> Font size of the letters; Composition of pictures and text on a billboard. <u>Expectations:</u> Do the advertisements look like road signs?
Colour	Covers use of colour in general or relative to a specific area of the sign	<u>Saliency:</u> (Lighting), colour and contrast with background. <u>Expectations:</u> Do the advertisements look like road signs?
Content	Content, meaning of the ad including graphical and textual elements	<u>Expectations:</u> Do the advertisements look like road signs? <u>Value:</u> Content of message, pictures and or texts that may evoke emotions; Content related to current goals of the driver (for example food, drink); Text that encourage drivers to engage in distracting activities.
Luminance	Use of luminance or retro-reflectivity	<u>Luminance:</u> Does the illuminated billboard/object cause glare?; Does the brightness of the illuminated billboard makes not illuminated road signs almost invisible? <u>Saliency:</u> Lighting, colour and contrast with background.
Dimensions	Size and shape of the advertising device	<u>Effort:</u> Size of advertisement; <u>Expectations:</u> Do the advertisements look like road signs?

Table 5: Overview of NRA design safety criteria for RsA linked to the SEEV factors

The placement criteria for RsA are related to the effort and expectation factors of the SEEV-model. Several of the design criteria are also linked to effort and expectation: message sequencing, quantity of information, information presentation and colour. Salience and value are considered in several design criteria: movement, flashing lights, exposure and transition time, luminance, message sequencing, information presentation, colour and content.

The placement and design criteria are used as a framework for processing and analysing the content of the guidelines and legislation on RsA in the different countries/regions. The placement and design criteria are used as a framework for processing and analysing the content of the guidelines and legislation on RsA in the different countries.

3.2. Europe

In response to the e-mail survey we received information from 18 countries (69% response rate).

The first section gives an overview of the safety related RsA criteria included in the current guidelines and/or regulations of the 18 participating European countries (section 3.2.1). In section 3.2.2 a detailed overview of current RsA procedures and practices in the 6 PEB countries is given, and this is followed by a short overview of procedures and practices in the other 12 European countries in sections 3.2.3. and 3.2.4.

3.2.1. Road safety criteria in European RsA guidelines/legislation

This section gives an overview of RsA safety criteria derived from the information and documentation (current legislation and guidelines) received from the NRAs (CEDR experts). The documents and links were searched thoroughly on content related to our safety criteria. Documents in Dutch, English and French were analysed on the original versions; for documents in other languages, google translations were used. In a final step, the structured output for each country was sent to the respective CEDR expert asking for a final verification and validation.

In total, data from 18 countries was gathered and processed. The processed output of 12 countries was final checked and validated by the experts (May 2018).

The detailed overview of the specific content in the guidelines and/or legislation of the countries, related to the RsA safety criteria, can be found in the tables in annex C. The tables present the relevant content (restrictions, specifications) for each criterion, including the source.

It should be stressed that the researchers depended on the input from the CEDR experts for this inventory, which may have been fragmented and incomplete. There were large differences in the size and level of detail of the replies to the survey. Furthermore, a lot of documentation was only available in the respective language, and google translate did not always deliver appropriate output. Therefore, a final validation of our output by the CEDR experts was a final necessary step. This was successful for most countries but for 6 the final validation did not arrive in time for the Deliverable. Nevertheless, all output is included in this report and in the tables in Annex C – the not validated output is always presented separately from the validated output. Especially for the output which was not finally validated, it may be that we are missing relevant information.

It should also be noted that other guidelines may be used at the local levels in these countries but this is out of the scope of this inventory. Current revisions or new developments are also not taken into account in this part but are mentioned in the next section (3.2.2).

Tables 6 and 7 underneath give a simplified overview of the RsA safety criteria used in the European countries, with the following specifications:

x	Content describes, mentions or directly relates to the specific criterion
(x)	Content indirectly relates to the criterion OR covers a small part of the criterion OR criterion can be deduced from a general content OR content is yet covered in another primarily suiting criterion (e.g. overlap between road environment and longitudinal/lateral placement)
	No content found related to the criterion
	Information exists but was not readily available (e.g. Austrian guidelines to be purchased)

Country	Document	Longitudinal placement	Placement Criteria			Road environment
			Lateral distance	Vertical placement	Orientation viewing angle	
PEB (6)						
Flanders	Guidelines	x	x	x	x	(x)
	Legislation	x	x	x		(x)
Ireland	Guidelines	(x)	(x)			(x)
	Legislation					
Netherlands	Guidelines	x	x	x	x	x
	Legislation					
Northern-Ireland	Guidelines					
	Legislation	x	x	x		x
Slovenia	Guidelines					
	Legislation	x	x			(x)
Sweden	Guidelines	x	x	x	x	x
	Legislation		x			
Other European countries (6)						
Austria	Guidelines					
	Legislation		x			(x)
Cyprus	Guidelines					
	Legislation	x	x	x		x
Germany	Guidelines					
	Legislation	x	x			(x)
Italy	Guidelines	x				
	Legislation	x	x	x	x	x
Lithuania	Guidelines					
	Legislation	x	x	x		x
Luxemburg	Guidelines					
	Legislation	x	x	x		x
Other European countries (not validated) (6)						
Estonia	Guidelines					
	Legislation	x	x		x	(x)
Finland	Guidelines	x	x			x
	Legislation					
Hungary	Guidelines					
	Legislation	x	x	x		x
Iceland	Guidelines					
	Legislation	x	x			x
Malta	Guidelines	x	x	x		x
	Legislation					
Norway	Guidelines	x			x	x
	Legislation	x				(x)
Number of countries (18)		17	17	9	6	18

Table 6: Overview of safety related placement criteria for RsA in Europe

Country	Document	Design Criteria									
		Movement	Flashing lights	Exposure & transition time	Message sequencing	Quantity of information	Information presentation	Colour	Content	Luminance	Dimensions
PEB countries											
Flanders	Guidelines	x	x	x	x	x	x	x	x	x	x
	Legislation						(x)	x	(x)	x	(x)
Ireland	Guidelines										
	Legislation										
Netherlands	Guidelines	x	x	x	x	x	x	x	x	x	x
	Legislation								x		
Northern-Ireland	Guidelines										
	Legislation	x					(x)	(x)	(x)	x	x
Slovenia	Guidelines										
	Legislation									(x)	
Sweden	Guidelines	x		x	x	x	x		x		
	Legislation						(x)	(x)	(x)		(x)
Other European countries											
Austria	Guidelines										
	Legislation										
Cyprus	Guidelines										
	Legislation									x	x
Germany	Guidelines										
	Legislation										
Italy	Guidelines										
	Legislation	x	x	x			(x)	(x)	x	x	x
Lithuania	Guidelines										
	Legislation						(x)	(x)	x		(x)
Luxemburg	Guidelines										
	Legislation	x	x	x			x	x	x	x	x
Other European countries (not validated)											
Estonia	Guidelines	x	x	x						x	
	Legislation		x				x	x	x	x	x
Finland	Guidelines	x	x	x				x	x	x	x
	Legislation										
Hungary	Guidelines										
	Legislation	x	x				x	x	x	x	x
Iceland	Guidelines										
	Legislation										
Malta	Guidelines	x	x	x	x		x	(x)	x	x	x
	Legislation										
Norway	Guidelines				x	x	x	x	x	x	x
	Legislation			x			(x)	(x)	(x)		(x)
Number of countries (18)		10	8	9	5	4	11	12	12	12	13

Table 7: Overview of safety related design criteria for RsA in Europe

Overall findings: (in view of the above remarks and limitations, the following results should be considered as approximate – it is possible that more countries than presented cover certain safety criteria)

- Of the 18 countries, 3 have (voluntary) guidelines or recommendations and 8 have formal (mandatory) law relating to the safety of RsA. Seven countries have a combination of guidelines and legislation.
- Placement criteria are covered more than design criteria in the current European legislation/guidelines (mostly in legislation: 14). All 18 countries cover restrictions on the placement of RsA relative to the (complex) road environment, which is often indicated in terms of specific (minimum) longitudinal distances from certain road features or zones and/or lateral distances for different road types, where RsA is prohibited.
- At least 11 of the 18 countries have 1 or more guidelines and/or regulations related to changeable RsA, which includes digital/LED billboards (5). Mostly this covers the motion in the advertisement, as well as exposure time and the use of flashing lights. Restrictions on the use of a sequence of displays/messages as part of a single advertisement are rather rare (5).
- Luminance is considered in at least 12 countries.
- The majority of the countries furthermore has defined restrictions on the dimensions (13), colours (12), content (12) and information presentation (10) of RsA.

The level of detail of covered safety related guidelines and legislation on RsA varies greatly between countries. On the one side, there are countries where safety issues for RsA are only included in vague and general terms leaving a lot of space for interpretation, e.g. Ireland with a general guideline that “RsA needs to be tightly regulated for road safety reasons” without further specifications or criteria, or Germany where the legislation determines that “advertising devices may never distract or annoy road users”, also without further input for interpretation or design recommendations/criteria. On the other end, the Netherlands jumps out with very detailed guidelines for RsA by road/area type. These are published and readily available for local authorities to shape their own policy. The Dutch guidelines furthermore distinguish between essential criteria, very important criteria, and criteria for consideration. Besides the Netherlands, also Flanders covers all the possible safety criteria for RsA, partly in legislation and mostly in the guidelines developed by the NRA (AWV). Other countries with a good coverage of the safety related criteria for RsA are Sweden, Luxemburg, Italy and Malta, although with very differing levels of detail and specification.

Longitudinal placement

For nearly all countries we found qualitative criteria for longitudinal placement of RsA. Some countries (5) also specify minimum distances from other features or areas of the road environment, mostly from complex traffic situations, including traffic lights, intersections, roundabouts, tunnels, curves, as well as other advertising devices. The minimum distances vary between countries, and also depend on the type of RsA, road type and speed limit. In only a few countries a specific restriction on the density of RsA on one location is found. Emphasized qualitative criteria are for instance that RsA may not obstruct the visual guidance of the road or the visibility of situations, and that it should not be located on roads with a high quantity of information. Some countries indicate when RsA may be permissible: e.g. in Sweden “in less complicated traffic environments, advertising may be permissible on long straight stretches of road without road signs or other elements which require time to observe”.

Lateral distance

We gathered information from nearly all countries on road reserve/protection zones where no RsA is permitted. These obstacle free zones differ between countries and by road type, road area, speed limit and RsA type. Legally determined quantitative criteria for motorways go from 30m (e.g. Flanders) up to 100m (Austria). In the Dutch guidelines on the other hand a minimum distance of 13m from the edge line of the motorway is proposed. When different types of RsA are considered, generally more strict criteria count for either bigger and/or illuminated and/or digital devices. This criterion can also be qualified as “visibility from the road”, e.g. the Italian legislation and the legislation of Northern-Ireland prohibit advertising visible from motorways or main roads. Countries also often emphasize that RsA may not be located on traffic islands, may not hinder the view on traffic signs and signals nor the free passage of road users (including pedestrians). In some cases mobile advertising is specifically mentioned, e.g. in Ireland “random parking of advertising truck trailers visible from the road should be regarded as a form of unauthorised advertising”.

Vertical placement

For some countries we found criteria for the height of RsA and for overhead placement, depending on road type and RsA device. While in Sweden and Lithuania overhead placement is not allowed, other countries quote quantitative limits, e.g. on Dutch state roads overhead RsA should only be placed on buildings and traverses that are min. 8m from the road, and in Luxemburg this is min. 6m. Some criteria were also found for the min. and max. height of devices: e.g. in Flanders, the guidelines define that digital billboards may not be placed on eye height and the bottom of the screen must be min. 2m above ground level. Furthermore, their Highway Code indicates that green or red coloured adverts, placed at less than 7m height, are forbidden within 75m from traffic lights. The Dutch guideline is more strict: preferably advertisement along the road is not placed in the zone between 1,2m and 4m, as this is the zone with most driving task related information. If there is a bicycle path or sidewalk, the lower edge of RsA may not be lower than 2,3m above the road.

Orientation viewing angle

Some countries (6) cover this in their guidelines/legislation. Most of them indicate that RsA may not be placed parallel to the road. The angle of the RsA with the carriageway is mostly set between 60° and 90° (e.g. Flanders, the Netherlands, Norway).

Road environment

This criterion covers restrictions on placement relative to the road environment (e.g. speed limit, road situations, roadside environment), and therefore there is some overlap with “longitudinal placement” and “lateral distances”. We can say that all countries specify at least some restrictions related to the road environment (including longitudinal/lateral placement). Almost all countries distinguish between road types, speed limit (e.g. motorways, regional, local roads), and/or zones (inner/outer city) for dealing with RsA – this is often also related to the legal competences of the different road authorities. With regard to distinguishing by road environment, the Netherlands go furthest with criteria prioritized and adapted in function of the road environment (based on road category, area, intensity of use and speed regime). Also in Norway guidelines’ assessment depends on factors such as speed limits, traffic patterns, traffic density and accident history at the site.

Movement

We found guidance on the presence of motion in adverts in 10 countries. Moving images or dynamic ads are mostly forbidden or advised against (9 countries) – some indicate this especially for motorways (higher speed roads). In Estonia, smooth and slow movements of individual elements in an advert are allowed. Reference is also specifically made to special effects (not allowed, e.g. Flanders, Netherlands, Italy, Malta). In Malta, electronic screens should have a default design to freeze the display if a malfunction occurs.

Flashing lights

In the guidance of about half of the countries we found criteria on the use of flashing lights. There is consensus that flashing (or blinking or intermittent) lights/images on RsA should not be allowed, especially on motorways.

Exposure & transition time

Half of the countries have quantitative limits for these criteria. Exposure time is also referred to by display time in the different countries, relating to the same concept. This is mostly considered in guidelines rather than in legislation. The proposed min. exposure time generally lies between 6 sec. (e.g. Netherland - although a preference of 10 sec. is indicated, Luxemburg) and 30 sec. (e.g. Flanders, Finland). Other countries have limits of min. 8 (e.g. Malta) and 10 (e.g. Estonia) sec. or give qualitative guidance, e.g. Sweden: “Time during which every picture is visible should be longer than the time it takes for the road user to pass at the specific speed limit, the section from which the sign is visible (display time in function of speed limit and road environment)”. In Malta, a formula is provided to work out the display time to be compare to a min. of 8 sec: Minimum Display Time (s) = Sight Distance to Electronic Billboard (m) / Speed Limit (m/s).

Transition time is referred to by a few countries (4) and differs (Flanders: immediate and if not, maximum 2 sec. and a black screen in between; Netherlands: maximum 0,1 sec. without special effects; Finland: approximatively 2 sec. and the transition should be progressive - the ad must shut down slowly by sliding, and Malta: maximum 1 sec.). Note that the guidelines or regulations regarding transitions sometimes seem to contradict, for instance ‘slow, progressive’ in Finland and ‘as abrupt as possible’ transitions in the Netherlands. As the info from Finland is not final validated though, we have to be careful with this statement.

Message sequencing

Only in a few countries (5) the use of a sequence of displays/messages as part of a single advertisement is mentioned in the guidelines and this is generally not allowed.

Quantity of information

We found a reference to quantity of text (message length, number of elements) in the documents of 4 countries. In general, they all describe that the message should be easily and quickly understood so the quantity and length and amount of information should be limited. For example, in Norway this is specified into: “no website or phone numbers above 50km/h roads; RsA should be seen as a whole so not more than 8 words, symbols, images and numbers combinations”.

Information presentation

The documentation of 11 countries cover the presentation of RsA. On the one side, this criterion is partly included in a general quote that is often found in the RsA related legislation,

namely that RsA may not resemble, imitate, have the same meaning as, or be confused with official road signs. On the other side, some countries give more specifications, e.g. it may not mislead or surprise road users, the screen cannot be divided into different screens, there should be a good contrast between text and background. In Luxemburg, for instance, the legislation states that no handwritten inscriptions may be used and defines minimum letter heights at given speed limits (50 km/h: 90mm, 70km/h: 130mm, 90 km/h: 180mm).

Colour

For the majority of the countries (12) this criterion is covered, but like for information presentation, colour criteria can also be derived from the common general regulation that RsA may not resemble or be confused with official road signs. Some countries refer specifically to “may not resemble/imitate colours of road signs” and others are more detailed, e.g. Flanders (within 75m from traffic lights, no green or red coloured adverts may be placed less than 7m high).

Content

Content criteria (covered in 12 countries) can also partly be derived from the commonly found general regulation that RsA may not resemble or be confused with official road signs. Signs or symbols used for traffic signs may not be used in RsA. Besides that, some countries (5) make specific reference to messages (to be avoided) that are offensive, in contradiction with the public order/interest, ambiguous, trigger high mental load (complex) or strong emotions (e.g. anxiety), trigger actions that distract from the driving task, lead to abrupt driving stops, include special optical effects... Two countries mention also that complex words and number combinations, phone numbers or websites should be avoided. Content of RsA is often also a matter included in regulations on advertising in general.

Luminance

We found criteria for luminance/illumination and/or retro-reflectivity in 12 countries. A common finding is that legislation often determines that RsA may not cause glare or dazzle road users (e.g. Flanders, Northern-Ireland, Slovenia...). Reflective materials are also often not allowed (e.g. Italy, Luxemburg, Hungary, Norway, Finland, Estonia). Some countries indicate that they do not have established luminance criteria yet (e.g. Luxemburg, Estonia). A commonality in the countries with luminance criteria is that the RsA brightness should not exceed the luminance of the environment (and of the public lightning) and that the brightness should automatically adjust according to the ambient light (e.g. Flanders, Finland, Malta). For a few countries we found quantitative criteria. In the Netherlands guidance is provided depending on the size of the billboard and location of road. They distinguish, amongst other, rural roads (max. 500 cd/ m²), urban roads (max. 750 cd/ m²) and town centres (max. 1000 cd/ m²) (complete table can be found in annex C). In Italy, light advertisement cannot have an intensity of more than 150 cd/ m². In Finland, at dark time, the average luminance must not exceed 300 cd/m². In Malta, the brightness level is not to exceed 300 cd/m² during the day and 100 cd/m² during the night. In Finland and Norway self-illuminating adverts may not be placed along roads without illumination.

Dimensions

Size and shape criteria (covered in 13 countries) can also partly be derived from the commonly found general regulation that RsA may not resemble or be confused with official road signs. Sometimes specific reference is made to the fact that RsA may not look like road signs in terms of shape (e.g. the Netherlands, Hungary, Luxemburg, Estonia) and that the

size or shape (or unusual design) may also not dazzle road users (e.g. Northern Ireland, Norway). Quantitative restrictions regarding the size are covered in several RsA guidance documents, but the scope and precision varies a lot. In Flanders, the guidelines precise a max. size for a specific type of billboard and road network: max. 5m² for a digital billboard on regional roads and motorways (primary network). In Italy, the max. size of 6m² is only for roads outside built-up areas. In Finland, billboards should never exceed 50m². In Cyprus, the legislation is more complex as it specifies max. size, height and width in function of road type, environment and lateral distance. In Norway, they define the max. size in function of the speed regime and the visibility distance.

3.2.2. In-depth overview of RsA procedures (CEDR-PEB)

3.2.2.1. Belgium - Flanders

Based on input from the Agency for Roads and Traffic (Agentschap Wegen en Verkeer, AWV), Belgium. AWV administers ca. 7.000 km regional roads and motorways in the Flemish part of Belgium.

Documents:

AWV gives an overview of the current legislation and guidelines for allowing devices along the regional road network and motorways: <http://wegenenverkeer.be/vragen/wetgeving-rond-publiciteit-langs-gewest-en-snelwegen>

The regulations differ for different types of devices. A signboard is a device installed to display the name or the logo of a business in order to make it visible (not considered to be publicity). It has to be located on the place of the business and its size has to be reasonable. Advertising devices include all other devices made for advertising.

The **RD of Dec. 14th 1959 on advertising** is the main legal base for allowing RsA. RsA which is recognizable from protected touristic roads (like motorways), from protected non-touristic roads and in protected landscapes is only allowed under very strict conditions (depending on the status of the road) which can be found in the RD. To know if a regional road has such a statute, the competent district of AWV should be contacted.

Specific regulations with regard to the design of advertising devices (not causing glare, no resemblance/confusion with road signs, on regional roads: no illuminated RsA with red or green colors within a distance of 75m from a traffic light and less than 7m above the ground) are included in the **Highway Code of Dec. 1st 1975**.

The **Vlaem II of June 1st 1995** states that the illuminated publicity may not exceed the normal intensity from the public lighting.

For the regional road network, the **Decree on “building lines” (Rooilijndecreet) of May 8th 2009** and **internal guidelines** based on the former RD’s of 1934 on “reverse construction strips along national roads” (achteruitbouwstroken langs rijkswegen) define specific regulations according to the road zone.

For the motorways, the **Law of July 12th 1956** and the **RD of June 4th 1958** state that publicity devices are prohibited within the building-free zone of 30m along motorways.

Furthermore, **AWV** developed specific road safety related criteria for LED-devices. These are internal **guidelines** which are strictly followed by the AWV advisors. These were developed a few years ago within a working group of AWV experts, based on convention rather than on research.

Procedure:

Most of RsA on private/public ground, along regional roads and motorways needs permission granted by the local authorities. Only certain signboards do not need a permission (e.g.: signboards not exceeding 4m² not producing light and placed on a building)

- Regional road network: (Rooilijndecreet May 8th 2009 and internal guidelines based on the former RD's of 1934)
 - o Within the “red line” (= public ground next to the carriageway), no RsA is allowed without permission from the Agency for Roads and Traffic (AWV). Billboards are not permitted and exceptionally permission are given for signboards (≤5m², not illuminated and not exceeding 4m height).
 - o Within the “buffer zone” (private ground between the “red line” and the “building line”), no advertising is allowed without permission from the Flemish road administration (AWV).). Billboards are not permitted and permission are exceptionally given for signboards (≤5m², not illuminated and not exceeding 4m height).
 - o Behind the building line, permission is given by the local authority.
- Motorways:
 - o RsA is not allowed in the “building-free zone”, i.e. within 30m from the carriageway. (Law of July 12th 1956 and RD of June 4th 1958)

For local roads, the municipalities provide permissions for RsA. They use own criteria, which can be more or less strict than the AWV criteria. The AWV internal guidelines are made public to support municipalities.

AWV advises for placing/allowing advertising devices are based on legal grounds and their ‘duty of care’. Municipalities are obliged to ask advice from AWV for publicity along regional roads. For public regional areas, also permission from AWV is required. For private domains, requests arrive at AWV via the municipality or directly. The AWV advice is not binding, except in case of legal grounds.

Enforcement on unpermitted RsA on public zones is done by the regional road administrators (AWV). For devices on private domain, the enforcement should be done by the municipality. The specific regulations based on the Highway Code are also enforced by the police.

Current developments on legislation/guidelines:

New, more strict, legislation is in progress. It will take all Flemish roads into account, so also municipal roads. The background for this initiative was a political urge for actualizing the old regulation (1959) on RsA, including also criteria on LED advertisement. The new regulation is based on input from a governmental working group on Publicity, involving experts from AWV, and takes the results from 2 studies – ordered by AWV – into account (literature study on effects of LED advertising signs: Brijs et al., 2014; simulator study on effects of LED billboards on driving: Mollu et al., 2016). In the end, the new regulation will be a political decision, balancing needs for road safety (AWV) and needs from the publicity industry. Some objections from the industry on a draft version of the new regulations related to display time (they prefer 6 seconds instead of 15 seconds) and they questioned in general the link between RsA with accidents.

A main idea behind the new regulations is that the criteria have to be enforceable. The AWV experts expect the new regulation to be in force within this year (2018).

Opinions on current practices and future trends:

The current position from the AWW advisors is sometimes weak. They may give a negative advice after which the advertiser appeals against this decision, and then it is up to the provinces to follow the AWW advice or not – sometimes they do, sometimes they don't.

There are still many advertising devices along the roads which are not permitted.

In the experts' opinion, the publicity industry agrees with regulations for RsA, as long as the rules fit to them. The industry is one of the main sectors buying floating car data to decide where to place their devices: spots with a lot of stationary traffic. A dangerous upcoming phenomenon is the use of interactive devices (this is already dealt with in the current internal AWW guidelines).

Opinion on RsA legislation vs. guidelines

The AWW experts look forward to the upcoming, more strict and uniform, Flemish regulations. On the other hand, the new regulations will also be more complex, as they will take into account interests from the provinces and municipalities (more different road types).

For the AWW experts, RsA regulations are ideally made with as little as possible space for own interpretation, but at the same time they should allow enough flexibility for the advisor, to take the specific road situation into account.

3.2.2.2. Ireland

Based on input from Transport Infrastructure Ireland (TII). TII is the national roads authority for Ireland. They are the operation and planning authority for the national (strategic) roads network. TII's primary function is to provide an integrated approach to the future development and operation of the national roads network and light rail infrastructure throughout Ireland. TII's mission is to provide high quality transport infrastructure and services, delivering a better quality of life and supporting economic growth.

Documents:

The primary legislation in Ireland with regard to using/permitting RsA is from the **Planning and Development Act 2001**: <http://www.irishstatutebook.ie/eli/2001/si/600/made/en/print#>

While there are many references to advertising within the text, the substantive issue is that advertising is seen as 'development' and as such requires planning permission from the relevant planning authority. There is no mention of road safety in this Act.

There are currently 31 local authorities within the Republic of Ireland. Each having both a role as planning and road authority. For decisions effecting the strategic national road, local authorities must consult TII. Local authorities cannot grant a licence without agreement with TII for all decisions effecting this network (approx. 5.300km in length).

This legislation is cross referenced in other relevant guidelines, for example, "**Spatial Planning and National Roads**" and "**Guidelines for Planning Authorities January 2012**" (<http://www.tii.ie/tii-library/land-use-planning/Spatial%20Planning%20and%20National%20Roads.pdf>). This does reference the need to 'consider' road safety issues and to not create visual clutter or distraction or reduce visibility:

- National road network: RsA needs to be tightly regulated for road safety reasons.
- Random parking of advertising truck trailers visible from the road should be regarded as a form of unauthorized advertising.

The guidelines do not include details or apparent road safety related criteria, so the planning authority makes case-by-case subjective judgements. TII can raise a concern if they identify an RsA that may be impacting road safety, and the planning authority may then ask for it to be removed if they concur. In terms of enforcement, it is necessary to go back to the Planning Act to take any official action. The Act does not have any detail and is very easily challenged.

The TII (2000) guidelines for "**The use of Variable Message Signs on national Roads**" make specific reference to the total restriction of any advertisement or promotion unrelated to road safety being displayed on a roadside VMS (although these refer to VMS on the road, rather than visible from the road).

Procedure:

Getting permission for RsA is down to the local planning authority, i.e. the local council. Local authorities are also the road authorities for the non-strategic network. TII covers the strategic network although there are some legacy roads that go through other planning areas.

All forms of unauthorized RsA along the national (strategic) road network should be removed by the local planning authority, if needed on the instruction of TII. Local authorities will usually involve TII in judging planning applications, and are obliged to inform them.

Each local authority produces their own development plan (5 year cycle) and these will address or make reference to the acceptable use of advertising in a public space, although this rarely has any defined criteria. For example, an extract from the Dublin City Council Development plan is reproduced below:

(<https://www.dublincity.ie/sites/default/files/content/Planning/DublinCityDevelopmentPlan/Documents/AdoptedAppendix27OutdoorAdvertisingStrategy.pdf>)

*... " In order to manage an effective programme of outdoor advertising the city council has developed a policy based on geographical zones. These zones cover all parts of the city, ranging from areas of architectural, historical and cultural sensitivity, to residential areas, to areas of little architectural or historic significance. Based on these zones a range of controls and policies have been developed for **each zone ranging from the prohibition of outdoor advertising in the most sensitive areas to more general controls in less sensitive areas where certain types of advertising will be considered**. Consideration will be also be given to the need for sensitive treatment and an appropriate transition at the interface between zones. These zones have been organised into development management categories, which can be classified as follows:*

- *Zone 1: This zone encompasses those areas that are most vulnerable and sensitive and primarily relates to the Georgian area of Dublin city. There is a strong presumption against outdoor advertising in this zone.*
- *Zone 2: Zone of significant urban quality that comprises retail and commercial uses. In this zone outdoor advertisement may be permitted subject to special development management measures.*
- *Zone 3: The radial routes leading into and out of the city are areas where opportunity exists for the managed provision of outdoor advertising. Subject to compliance with the development management standards, as set out in Section*

6, the development of outdoor advertising in this zone, will be open for consideration.

- Zone 4: Zone of existing and potential high amenity related to the waterways and the coast inappropriate for advertising. This zone includes the river Liffey Corridor, the canal corridors and along the campshires in the Docklands. There is a strong presumption against outdoor advertising in this zone*
- Zone 5: Zone of significant urban development where advertising could form an integral part of newly created streetscapes. This zone relates to key developing areas (KDAs) where advertising may form part of new streetscapes, having regard to the need to protect residential amenities. Subject to compliance with development management standards the development of outdoor advertising in this zone will be open for consideration.*
- Zone 6: This zone consists of areas predominantly residential in character where outdoor advertising would be visually inappropriate. Within this zone, there are also large-scale tracts of commercial land-use which have a separate robust character and may have the potential to accommodate outdoor advertising. ... “*

An example of a planning application to Dublin City Council for replacing an existing advertising board with a new digital (LED) advertising board can be found here:

<http://www.dublincity.ie/swiftlg/apas/run/WPHAPPDETAIL.DisplayUri?theApnID=2512/18&Se archID=2>

Current developments on legislation/guidelines:

There are no plans for new legislation or guidelines.

However the 2013 Road Safety Strategy is shortly coming to an end – with the next one being in 2021 – and there will be a push by TII to get stronger guidelines for billboard issues into this strategy; having a targeted action in the government’s road safety strategy results in more attention being paid to an issue.

As part of TII road safety inspection (RSI) programme, teams who will be conducting driver through surveys (starting at the end of May 2018, finishing by end of September 2018) have been specifically asked to note RSA adjacent to the motorway network (approx. 1.000 km). Potentially by the end of September 2018 TII will have a reasonable estimate of the number of advertising signage directed towards motorway users. This can then be double checked with the number of consultations TII had with the local authorities on the subject of granting permission for these structures adjacent to the motorway. Example of a record when a possibly illegal (unpermitted) sign is picked up during the RSI drive through:

Extended TAG details - x

Tag editing form for TAG-ID 47513:

Test Only - Tag added on 2018-03-08T13:58:59.434Z

Extended Tagging Fields

System Inputs+

User Inputs

ELEMENT:

M ▼

LOCATION:

eastbound on approach to toll plaza

ISSUE:

Not_Selected ▼ | Not_Selected ▼

DESCRIPTION:

Roadside advertising on LHS of motorway with field

PROBLEM:

Advertising may distract from normal driving function. Driver may drift out of lane if distracted by the billboard resulting in a 'side swipe' type collision.

COLLISION TYPE:

Side Swipe ▼

SEVERITY (System):

9

LIKELIHOOD (System):

2

RISK (System):

Level 3

SEVERITY (User):

9

LIKELIHOOD (User):

2

RISK (USER):

Level 3

RECOMMENDATION:

Bring to the attention of the local authority the possibility of illegal advertising beside the motorway.

BROAD SOLUTION:

Local Issue for Local Authority - e.g., Boulders/Advertisement Signage ▼

Document Repository+

Review/Resolve Inputs+

Opinions on current practices and future trends:

RsA is a 'hot topic' in TII as the advertising industry definitely feel that digital billboards are the future. 'Augmented' adverts are starting to be seen at bus stops in particular (e.g. in London), and also there are 'intelligent' adverts starting to be installed (e.g. adverts that change according to the person or car passing). Augmented adverts include Augmented Reality, allowing everyday marketing materials (print, digital, multimedia, and even GPS locations) to be infused with highly interactive multimedia experiences like videos, 3D models of products and characters, and even to be infused with extremely detailed analytics and content targeting. There are examples where such technology was used to promote products using the "glass" on the side of the bus shelter. In reality the glass is a large digital screen, which is projecting what the people would see if it was just glass. This is done by installing a camera and displaying live images of the streetscape. To any person using the bus stop the street view would seem normal. The augmented part comes in when the advertisers display something else over the live image. (Example: <http://augmentedpixels.com/pepsi-and-coca-cola-embrace-new-technology/>)

The expert has no knowledge of specific incidents, although there are 2 locations with billboards on busy (non-national) roads where the incidence of incidents could be looked at. (There was an incident in Birmingham (England) at Christmas 2017 where there was a very bright billboard that may or may not have been a factor.)

The biggest structure owner is the railway industry. Their argument is that they can remove signs from heritage buildings in the city centre (which aligns with Council aims to protect such buildings) and replace with fewer – but digital – billboards. Dublin City Council has zones where billboards are allowed and those where they're not, in order to protect old buildings.

The industry are aware of the planning permissions process that they have to go through, although it is not very clear if they are aware of the safety issues. Besides that, there is definitely an awareness that they need to use their space to a maximum for their own revenue, e.g. multiple adverts on the same screen.

The current concern is the lack of understanding of the issues/risk combined with the rate of technological change.

Opinion on RsA legislation vs. guidelines:

Legislation for allowing RsA can be a bit too binary, while guidelines can be subtle and more flexible on a case-by-case basis. Therefore guidelines are more useable than legislation, and in any case, should definitely come first.

3.2.2.3. Netherlands

Based on input from the Dutch national road authority (Rijkswaterstaat, RWS), the Netherlands. RWS is responsible for state roads only. These are mainly the motorways. RWS is not responsible for advertisements that are placed outside the ground that belongs to the state roads. The ground that belongs to the state roads is only the ground that is just next to the actual road. RsAs placed along other roads and advertisements placed outside the ground of the state roads belongs to the responsibility of municipalities. This is only the ground just next to the state roads.

Documents:

There are 3 main references:

- **Guidelines** prepared by the **RWS** in 2011 on the use of RsA alongside state roads (mostly motorways).
<https://www.rijksoverheid.nl/documenten/richtlijnen/2011/10/12/beoordeling-van-objecten-langs-autowegen-en-autosnelwegen>
- **Guidelines** prepared by **NSVV** (Nederlandse Stichting Voor Verlichtingskunde) "Richtlijn Lichthinder", last update in 2014, on luminance criteria for outside light sources. <https://www.nsvv.nl/publicaties/richtlijn-lichthinder-pdf/>
- **Guidelines** prepared by **CROW** in 2017 "Reclame langs wegen" on roadside advertising in different road environments inside and outside urban areas. These include many of the RWS criteria for motorways.
<https://www.crow.nl/publicaties/reclame-langs-wegen>

All of these publications are guidelines and have an advisory character; none is legally binding. Not complying with the most essential criteria can be (will be in case of RWS permits) a reason not to grant permission for roadside advertising. Some of the larger municipalities, e.g. Amsterdam and Rotterdam, have their own permit policies.

The RWS guideline focuses on billboards (and pieces of art) along 'their' roads, i.e. state roads, (mainly) motorways. The CROW guidelines relate to different road types (categories) inside and outside built-up areas. The RWS guideline distinguishes between essential criteria ('slagboomcriteria') and criteria for consideration. The CROW guidelines distinguish between

3 types of criteria: essential criteria ('slagboomcriteria'), very important criteria, and criteria for consideration.

The guidelines provide criteria regarding where to put advertisements and how to do it e.g. night-time luminance criteria and criteria regarding content, e.g. not similar to road signage. Rather than a ban, they contain certain requirements, e.g. no moving images, a minimum display time of 6 seconds (preferably 10 seconds) per image, etc.

The RWS and CROW guidelines have been developed from a road safety perspective, i.e. minimizing the (presumed) negative effects. A total ban on RSA has not been an option, given the substantial financial benefits for (local) governments and inconsistent research outcomes regarding the impact of ordinary advertisement signs. Moreover, plenty of billboards were placed along roads when RWS and CROW published their guidelines. The NSVV luminance criteria also have an environmental aspect.

The guidelines are based on literature research in combination with expert consultation to prioritize the initially very large set of potential criteria resulting from the literature. The advertising industry and the Association of Dutch Municipalities (Vereniging van Nederlandse Gemeenten, VNG) have been involved in the development process as well.

Publicity industry were involved in the guidelines' development process.

RWS ordered a literature review from TNO (Dutch research institute for applied knowledge) to inform the development of the guideline around 2009/2010 (internal document). Besides this literature review, RWS did not commission empirical studies.

Procedure:

In general, digital billboards alongside roads are placed on land under the authority of a municipality and not on land of the road authority. Billboards on land and buildings that are private property are also under the authority of municipalities. It is up to the municipality to give the required formal permission for placement of a billboard. They develop their own policies for granting permits. The various guidelines are meant to provide them with information to decide on this permission. Regularly but not always, municipalities ask RWS for advice regarding potential road side advertisements along state roads. This advice is free of obligation.

Up till now, in practice, the Dutch national government does not allow digital billboards on 'their' land alongside roads (which generally is some 15 meters immediately adjacent to their road up to a maintenance ditch, mainly motorways). They do allow billboards at petrol stations and the adjacent rest areas on motorways requiring to meet the criteria in the RWS guideline for rest areas (Richtlijn Verzorgingsplaatsen). For instance, advertisements are not directed towards the main carriageway except a 2m by 8m sign showing the name or sign of the petrol station firm.

Current developments on legislation/guidelines:

No updates are foreseen at the moment.

Opinions on current practices and future trends:

RsA is a fairly hot topic, both politically and in society. RSA seems to be a fast growing phenomenon and it is likely to grow further now that LED-technology is becoming cheaper and cheaper. This results in more digital advertising, not just on poles alongside roads, but also on the fronts of buildings (i.e. in an angle of 90° to the road user). The experts are not

aware of any incidents or accidents that were directly related to roadside advertising, although an indication of more crashes was found for 2 recently placed new digital billboards that gained media attention (A1 Terschuur and A12 Zoetermeer). Obviously, that is difficult to assess anyway.

Some municipalities accept and apply the guidelines and follow advice; other don't or only partially. The main reason for not applying guidelines is that they are not aware of them, or that according to local government, the financial benefits outweigh the potential safety effects (sometimes explained by denying or putting in doubt potential impacts on safety).

Given that the guidelines are not legally binding, formal enforcement of compliance is not an issue. Sometimes, not very regular, action is undertaken by RWS to a presumed undesirable situation based on coverage in the media, complaints by citizens, or an observation by a regional employee of RWS. It is up to the municipalities to check if existing RsA has been granted permission and if the RsA fulfils the criteria set in the permit. Enforcement policies regarding exiting permits differ between municipalities. The general feeling is that controlling and fining is limited.

To the experts' opinion, publicity industry do not have problems with guidelines as long as they are allowed to apply RsA and as long as there is a level playing field. There is no regular contact with industry although there are contacts with the branch organization.

An important evolution is that technology becomes cheaper, so the use of RsA can be expected to increase. It may become attractive for companies along main roads to put a large billboard on their office and rent it for commercials of other firms. Billboards aiming at people to take action (calling, texting, QR-codes, reference to websites) do not fulfil the current guidelines. Potential hacking of billboards is an issue that has not yet been considered in the Netherlands.

Opinion on RsA legislation vs. guidelines:

Ideally, at least the most relevant criteria become regulations, but in practice this is not feasible (enforcement) and politically it does not fit the Dutch tendency of deregulating. On the other hand, although media and political attention focuses on smartphone and cell phone distraction, distraction by digital billboards seems to gain more attention as well. Belgium recently started introducing new legislation.

The main arguments against regulation are that this would require formal enforcement and it is not clear whether that will be cost-effective. Moreover, Netherlands is in a process of deregulating and decentralizing decision-making rather than regulating and centralizing.

A pro of legislation would be the possibility to safeguard that road safety is somehow addressed in permits. General legislation may be sufficient to prevent smaller municipalities from overlooking this aspect completely.

Research needs:

Further research could address the question of which level of detail in legislation would be required. Where to place and how to design advertisements safely is context dependent. Detailed criteria may encourage municipalities to restrict to those criteria instead of accounting for the context and details of a specific request.

Legislation in the Dutch context could include criteria similar to the 'Beleidsregel Windturbines' (Policy Rule Wind turbines) which requires 'additional research' related to road safety and distraction for permit requests near interchanges. A Policy Rule related to digital

billboards of a minimum size of X m² along roads with a maximum speed over Y km/h for which an Environmental Permit is required (related to the Omgevingswet) could require 'additional research' related to luminance, image transitions, and position related to the road. How to specify criteria could be left over CROW guidelines and policy documents of local authorities in order to avoid detailed regulations.

Road authorities and organizations such as CROW like to keep updated about research to see whether guidelines need to be updated. More particular questions would be how to design transitions between images, e.g. shortly switching to black between transitions or switching directly. Experimental research may help to find out how to minimize the conspicuity of the transition.

3.2.2.4. UK (Northern Ireland)

Based on input from the Department for Infrastructure, Northern Ireland. The Department for Infrastructure's responsibilities include roads and public transport, regional planning and transport strategy. The Department is the sole road authority for all roads in Northern Ireland and is responsible for managing, developing and maintaining over 25.500 km of roads. Northern Ireland has fully devolved powers from the rest of the UK for all roads related legislation and guidelines although they tend to follow closely with what England does.

Documents:

The Department's main policy guidance on all types of RsA is contained in **RSPPG S035 - "Advertisements placed within road boundaries and overlooking Motorways"** (2005) (<https://www.infrastructure-ni.gov.uk/sites/default/files/publications/drd/advertisements-placed-within-road-boundaries-and-overlooking-motorways-rsppg-s035.pdf>). This document contains a reasonable amount of detailed criteria for allowing RsA but it is not clear what the criteria are exactly based on.

Relevant planning legislation and Planning Policy Statement 17 (PPS 17)

(https://www.planningni.gov.uk/index/policy/planning_statements/pps17.htm) and sections of the **Roads (Northern Ireland) Order 1993** – e.g. Articles 21 and 87, provide powers to control outdoor advertisements (<http://www.legislation.gov.uk/nisi/1993/3160/contents/made>).

The PPS 17 "control of outdoor advertisements" set out the policy of the Department of Infrastructure in Northern Ireland. Advertisement is defined as: "any word, letter, model, sign, placard, board, notice, awning, blind, device, or representation, whether illuminated or not, in the nature of, and employed wholly or partly for the purposes of, advertisement, announcement or direction, and ... includes any hoarding or similar structure used, or designed or adapted for use, and anything else principally used, or designed or adapted principally for use, for the display of advertisements, and references to the display of advertisements shall be constructed accordingly." Exceptions are: "Deemed consents" (specified categories of adverts that are deemed to be granted) and "unregulated adverts" (these do not need any permission, e.g. ads inside shops, election posters, ...). The PPS 17 defines the standard conditions for RsA, whether requiring a permission or not:

1. Site and advertisements have to be maintained in clean and tidy conditions
2. Any structure or hoarding for the purpose of displaying ads shall be maintained in safe conditions
3. If required by the Department, the removal shall be carried out to the reasonable satisfaction of the Department.

4. No adverts may be displayed without the permission of the owner of the site or any other person with an interest in the site entitled to grant permission

5. No advertisement may be displayed on or so as to obscure, or hinder the ready interpretation of, any road traffic sign, railway signal or aid to navigation by water or air, or so as otherwise to render hazardous the use of any road, railway, waterway (including coastal waters) or aerodrome (civil or military)

The Department of the Environment (meanwhile merged into the Department for Infrastructure) is responsible for the control of RSA. Planning applications are now handled at local council level, but policy and legislation are retained by the Department.

The (Northern Ireland) Roads Order stipulates:

- Article 21: No advertisements sited or designed primarily to be visible from a special road or which is likely to prejudice the safety of special road's users. There are some exceptions.
- Article 87: No sign, advert on/in the road or on any structure/tree in/on the road.

The current policy and legislation coverage for advertising pays little attention to the development and roll out of large scale electronic advertising signs. There is no specific guidance relating to digital advertising in Northern Ireland, but there are best practice **guidelines in England (SPAN 10/16)** and particularly through **Transport for London (TfL)**. It seems that many other parts of the UK have also adopted the broad thrust of this available guidance (TfL digital toolkit: <https://tfl.gov.uk/info-for/suppliers-and-contractors/digital-toolkit>).

The Institution of Lighting Professionals have produced a **Professional Lighting Guide (PLG 05)**, "The Brightness of Illuminated Advertisements" (<https://www.theilp.org.uk/news/ilp-launches-guide-to-illuminated-advertisements/>).

The situation in England is extremely similar to Northern Ireland, as the local planning authorities again have responsibility for the control of advertisements. The relevant piece of governing legislation is **The Town and Country Planning (Control of Advertisements) (England) Regulations 2007**, which states that the local authority has a duty to consult (with the Highways Authority) where they consider the advertisement "may affect the safety of persons using any trunk road". There are no other references to road safety or to the control of advertisements on roads in general.

The legislation does specify that advertisements on highway structures should be permitted where the structure in question has been designed for displaying the smallest size of poster panel. The advertisement must not be illuminated, larger than 2,16m² in area, or more than 4,6m above ground level. However these criteria are aimed at advertisements on bus shelters and information kiosks and are not applicable to billboards.

Guidance has been provided by the Department for Communities and Local Government in "**Outdoor advertisements and signs: a guide for advertisers, June 2007**". This explains the above legislation, and the process that advertisers must go through. An application for a RSA will be considered by the Planning Committee, who must take into account both "amenity" and "public safety". The former is a judgement as to whether proposed advertisement would align with the character of the neighbourhood, or whether it would be too prominent, either visually or aurally; the latter considers whether the advertisement will prevent or impact safe use of any form of traffic or transport. It is acknowledged that an

advert is designed to be distracting – the judgement that must be made is whether it is so distracting or confusing that it creates a hazard. In many circumstances the Planning Committee will consult the highway authority for this element. Many individual authorities will have policy statements which detail the considerations they deem relevant but there is little guidance available as to the criteria that should be used to make this judgement. The most recent policy document in this area - **National Planning Policy Framework, Department of Communities and Local Government, March 2012** – covers a much broader remit, and refers only to the consideration of amenity and public safety in passing. The draft text for the revised National Planning Policy Framework (to be published in 2018) is currently available for consultation, but is unchanged with relation to outdoor advertisements.

Procedure:

Current practice is, or should be, broadly in line with RSPPG S035. However, given the rapid development of digital advertising technology in recent years, there is undoubtedly growing pressure on the Department and Council Planners to allow more widespread and different types of RsA. The legislation bans such advertising on special roads.

Planning authorities have the final say, the Department for Infrastructure can object on road safety grounds or on traffic management / capacity grounds and usually their view would be taken on board and form part of that planning permission decision process.

Current developments on legislation/guidelines:

There is no knowledge of any plans to change legislation per se, with the exception of a memorandum to allow a time-bound trial of a number of large digital advertising signs (7) alongside urban motorways and special roads. If erected, they will be monitored for a 3 year period to determine whether they have any impact on collisions, particularly rear end shunts. This requires development of policy to facilitate this trial, and to this end a Director of Engineering Memorandum (DEM 173/18 LED Advertising on special roads and A2 Sydenham by-pass; Pilot project; www.infrastructure-ni.gov.uk/publications/led-advertising-special-roads-and-a8-sydenham-by-pass-pilot-project-dem-17318) (temporary policy guidelines) has been published and has caused some consternation amongst the road safety community. The final decision now rests with Belfast City Council. The proposing company for this trial is offering, as an added incentive, 3 years of free advertising of road safety messages. The Department would obviously welcome any guidelines that the CEDR project group comes up with. There is a lot of pressure on road authorities to support such advertising due to the revenue generated.

No other developments are planned, and since all of the existing documents were written before digital billboards were common, this is a real problem.

Opinions on current practices and future trends:

RsA is viewed as an urgent area and there is a lot of concern. The expert from the Department of Infrastructure is not aware of specific incidents and does not have any concrete evidence that RsA is a problem; the concern is because of the massive increase in the number of RsA. Like other road administrations, Northern Ireland is becoming increasingly concerned about the introduction of large animated LED advertising signs and the potential levels of distraction that they pose to drivers and riders. They have discussed this issue already in their CRASH Alliance (UK and Irish road authorities) meetings and the CEDR project is welcomed to address this issue. Their own policy guidelines date back to

2005 so they are in need of updating to reflect technological advances in advertising and their impact on road users.

In the expert's opinion there should be criteria for minimum time length, luminance, brightness and a ban on animation.

Current practice for allowing RsA is, or should be, broadly in line with RSPPG S035. However, given the rapid development of digital advertising technology in recent years, there is undoubtedly growing pressure on the Department and Council Planners to allow more widespread and different types of RsA.

A main concern are suppliers not complying with the agreed refresh rates and levels of animation as there are reports of them gradually increasing these over time. It is also claimed that the digital boards have automatic luminance control to respond to different natural lighting conditions. In dark winter nights, the light levels given off by these units can be especially disconcerting and distracting whilst driving.

In terms of enforcement, it is not always easy to find out who actually owns the billboards, so it tends to target the businesses that are advertising instead. There is a problem with enforcing adverts on mobile trailers. It is hard to permanently get rid of them as they can only be banned from one place at a time. They can literally move a few metres down the road and start again.

A local taxi firm is intending to have rolling news displayed on their vehicles, which is also causing a concern. A large van appeared in Belfast with large LED screens mounted on 3 of its sides with animated advertisements but the Department, with the help of the police, managed to get it removed on the grounds of road safety and road user distraction.

In the expert's opinion, industry promises to take into account road safety but often do not deliver. They are very innovative in technology development, e.g. proliferation of targeted ads. Note the offer to have road safety ads as part of the trial as another example of innovative sales.

Media link:

<http://www.bbc.co.uk/news/uk-northern-ireland-43059942>

Opinion on RsA legislation vs. guidelines:

There needs to be both guidelines and legislation. Legislation is needed in order to back up the guidance.

3.2.2.5. Slovenia

Based on input from the Slovenian Infrastructure Agency (SIA). SIA, a body within the Ministry of Infrastructure, is the national road authority in Slovenia.

Documents:

The **Roads Act (2010)** - Article 78 "Information and advertising on the State Road" specifies special conditions for setting up information and advertising facilities in- and outside urban areas (<http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO5788>).

Some reference to road safety is made in Article 107: "The police or municipal administration / inspector may order the removal of objects, devices or obstacles from the road if they:

- blind people in traffic,

- reduce the visibility of the road,
- reduce the visibility of traffic signals or traffic equipment on the road,
- mislead traffic participants,
- hinder traffic participants or reduce traffic flow,
- distract drivers."

In the **"Rules on traffic signs and road equipment"** - Article 7 "Placing traffic signs and equipment" it is stated that SIA does not allow setting up advertisements in the area reserved for traffic signs (<http://www.pisrs.si/Pis.web/pregledPredpisa?id=PRAV11505>)

Advertisement is also considered in the **"Rules on road design"**, Article 56:
<http://www.pisrs.si/Pis.web/pregledPredpisa?id=PRAV5811>

Applicants for RsA can be informed and ask permission via the SIA link: <https://e-uprava.gov.si/si/podrocja/nepremicnine-in-okolje/infrastruktura/obvescanje-in-ogljasevanje-ob-drzavnih-cestah->

Procedure:

Outside urban areas, within the buffer zone along the state Road, no RsA is allowed by SIA (Article 78 – Roads Act). Article 66 of the Roads Act defines the buffer zones, the protected areas of the road: 40 meters for motorways, 35 meters for highways, 25 meters for main roads...

Although the Roads Act sums up safety related reasons for removing RsA (Article 107), in practice it is uncertain that the police or municipal inspectors would remove an advertising object, because of distraction. The problem is how to prove that it is unsafe in a valid way in court.

Outside the buffer zone it is usually the "Ordinance on the Municipal Spatial Plan" which specifies RsA issues. The municipalities mostly allow advertising.

Inside urban areas the Roads Act allows advertising, so SIA can just request a study if there are doubts about safety (Article 2 – Roads' Act). Such a technical study includes information on location, display, installation and visibility. If the study proves that the RsA does not obstruct the sight distance and it is not against the Municipality Spatial Plan, SIA has no further options for rejecting the RsA.

Advertising displays are not allowed in areas reserved for traffic signs (Article 7 – Rules on traffic signs and road equipment), may not obstruct sight distance and have to be conform to the municipality spatial plan.

Current developments on legislation/guidelines:

No plans.

Opinions on current practices and future trends:

In the last decade, there has been a wild grow of (illegal) RsA along Slovenian roads. RsA is a hot topic within SIA and it is also increasingly criticized in the media. The biggest problem are the 30m² billboards, there are not so many digital billboards. LED displays are mostly found in bigger cities where they are placed on buildings along the roads, which are private property and SIA road inspectors have no country for that. It is problematic that they are often extremely bright, especially at night.

Because the legislation is loose, defenders of advertisement (mostly advertising agencies) find a way to set up billboards outside the protected area of roads.

Outside cities advertisers often place their billboards just a few cm outside the buffer zone along the state roads (contract with the land owner), where SIA has no jurisdiction or road inspectors. Outside that buffer zone, the municipalities mostly do not prohibit advertising and SIA has no jurisdiction there. There is a conflict of interest between safety and profit.

As the distance to the roads (outside the buffer zone) is quite big, advertisers place giant billboards (up to 90 m²). Usually billboards are also illuminated, though a building permit is needed for illumination.

There are concerns about degradation of nature and environment (as these billboards are often set in rural areas), light pollution and road safety. The state and its inspectors (traffic, environmental, building...) could intervene, but there is little interest. The Slovenian Strategic Plan describes how the cultural, natural etc. amenities of Slovenia should be protected and emphasizes the obligation of their care, but this is not well enough taken into account

(http://www.nc-piarc.si/dokumenti/gradivo_clanov/Brumec_clanek1_Road%20environment.pdf ; 2010).

RsA is not thus mostly not seen as a priority or problem by the Agriculture & Environment inspectors.

Often billboards are set up on private land and buildings, where there is not control.

Reference is made to the Slovenian motorway A1, which became over a period of time overloaded with commercial advertisement billboards ("jumboposters"). Close to the Trojane tunnels' entrances there are several billboards, in front left and right and above, also illuminated at night, which attract drivers. There were 8 road traffic accidents in 1,5 year time, which may or may not have been related to the RsA (http://www.nc-piarc.si/dokumenti/gradivo_clanov/Brumec_clanek1_Road%20environment.pdf ; 2010).

Slovenian media links:

<https://www.bb.si/blog/jumbo-plakati-reklama-ali-motnja> (October 2017: Jumbo poster – advertising or disorder?):

http://temnonebo.com/images/pdf/brosura%20osvetljevanje%20objektov%20za%20oghlasevanje_splet.pdf (Light pollution)

http://www.24ur.com/bin/video.php?media_id=61916801 (April 2017: Slovenia as a cover for poster chaos)

Opinion on RsA legislation vs. guidelines:

It is a problem that there are no legally based road safety criteria, so the position of road inspectors is weak. European guidelines would be very welcome.

Road safety criteria are best embedded in legislation. There should be a legal base for them in order to be applied. But a first step are probably guidelines and making the stakeholders and public aware of them.

3.2.2.6. Sweden

Based on input from the Swedish Transport Administration (STA). STA is the Swedish national road authority.

Documents:

There are three main legislative references relative to RsA:

- **Roads Act (1971:948)**
<http://www.notisum.se/pub/Doc.aspx?url=/rnp/sls/lag/19710948.htm>
- **Planning and Building Act (PBL) (2010:900)**
<http://www.notisum.se/pub/Doc.aspx?url=/rnp/sls/lag/20100900.htm>
- **Act on Special Provisions for Street Cleaning and Signposting, LGS (1998:814)**
<http://www.notisum.se/rnp/sls/lag/19980814.htm>

Advertising is otherwise governed within the Ordinance on Street Cleaning and Signposting (1998:929), which the county administrative board can apply with the aim of protecting the natural environment from advertised messages. The storage of inadmissible advertising within the road reserve, which is removed by the STA, is governed in the Act on Lost Property (1938:121). The Charge Ordinance (1992:191), the Roads Ordinance (1971:954) and the Road Marking Ordinance, VMF (2007:90) are also applicable in advertising matters.

STA has developed own internal roadside advertising **guidelines**. On the STA website they is some info on the general guidelines: <https://www.trafikverket.se/resa-och-trafik/vag/Reklam-intill-allman-vag/Mer-information-om-reklam-intill-allman-vag/>

Procedure:

Advertising is defined as message-bearing objects that are not dealt with in the road marking ordinance or other devices, and the purpose of which is to convey a message to the road user.

According to the current sections of the Roads Act, permission is needed:

- for "measures that may have a significant influence on road safety or be of inconvenience to the operation or use of the road" (Clause 43),
- for "lighting devices that impair the lighting conditions on the road" (Clause 45) and
- for "signs or comparable devices for advertising, propaganda or similar purposes" (Clause 46).

The sections state that the regulations are justified for road safety reasons. The Roads Act stipulates that permission is needed for setting up advertising matter within the road reserve or up to 50 meters outside the road reserve.

- Within the road reserve, the Swedish Transport Administration (STA) is responsible. Applications for RsA are always refused (Clause 43). The road reserve is the zone reserved for road signs, lighting posts and other devices necessary for guiding the road users and for the road in general. Within the road reserve, signposting (to locate local commerce and industry) ought to be acceptable.
- Up to 50m outside the road reserve, the County Administrative Board assesses applications in accordance with Clause 46 of the Roads Act. The County always follows the advice from the STA. No RsA is allowed.
- >50m outside the road reserve, the County Administrative Board or Municipality is responsible. Municipalities assess applications for advertising within areas with local plan.

In its capacity of road maintenance authority, the STA responds to submissions for comments concerning RsA outside the road reserve, which come from county administrative boards or municipalities (Clause 54 of the Roads Ordinance).

County administrative boards assess applications for advertising outside the road reserve, with the exception of matters that are assessed by the municipality. If the distance from the road reserve is greater than 50 m, county administrative boards have the right to grant permission, but they can also transfer the right to a municipality (Clause 6 of the Ordinance on Street Cleaning and Signposting).

Municipalities do not have to hear the STA advice, but often they do ask the advice of the STA. Mostly the advice is followed but not always – in that case the municipalities are mostly less strict in their assessment of RsA. The STA may appeal against permissions granted by municipalities.

STA is in general restrictive on RsA. They work with own road safety related guidelines for place and design of RsA. The municipalities do not have the STA guidelines.

If advertising is set up in the road area without permission, the STA is authorized to remove it. The STA keeps the billboard for at least 3 months, and the owner can retrieve it.

Current developments on legislation/guidelines:

STA is going to update the road safety guidelines. The new guidelines will be more strict and will mainly add criteria on digital RsA, based on results from an ordered study on effects of billboards on traffic safety (Dukic et al., 2011). A collaboration between different agencies to overlook RsA has started in 2017.

Opinions on current practices and future trends:

In the last years there has been an increase of RsA along Swedish roads, mainly along big roads and mostly big billboards. The area outside the road reserve is mainly problematic, which is not easy to address from a legal point of view.

RsA also shows up on trailer trucks and parked cars – there is no need for permission to park a car for example on own private ground or on rural ground with a farmer's agreement.

Advertising in the road area is generally very rare, except for signposting. There is a huge amount of illegal signposting (info on the direction of shops, restaurants, parks etc.), with little to do against.

According to the STA experts, the advertising industry say they want their RsA to be safe but their goal is to attract attention. They agree with aspects which are clearly too dangerous, so they want to know when it is too bright or when there are too many pictures in a short time... but they often minimize the risk.

Opinion on RsA legislation vs. guidelines:

A smart balance is needed: a lot of guidelines and not so much regulations. With legislation you need to be more strict, while with guidelines you can indicate what you aim at and different interpretations are possible in function of the situation. It is important though to be really strict on the clearly very dangerous issues.

A problem is that so many different authorities are involved and the governments do not always know who is responsible and who is going to do what. It would be easy if one government would be responsible. National guidelines would be helpful.

Research needs:

It is difficult to know what RsA aspects are really dangerous, there is a lack of real facts (knowledge and research). One of the most important issues according to the expert is that

road users cannot hurt themselves on RsA (dangerously located, solid structure, not crashworthy).

It would be helpful to learn more about the distinction between distraction and stimulation by RsA, e.g. on long, monotonous roads which do not pose a lot of cognitive demands on the driver a RsA can also shortly stimulate a fatigued driver.

What RsA aspects do we need to be really severe on and what aspects are less important (e.g. aesthetic issues).

3.2.3. Short overview of RsA procedures (CEDR)

3.2.3.1. Austria

Based on input from the Department Road Safety and Infrastructure Safety Management, Austrian Road Safety Fund (VSF), Ministry for Transport, Innovation and Technology, Austria.

Documents:

- **Federal Roads Act (Bundesstraßengesetz 1971):** Sect. 25 of the Federal Roads Act (Bundesstraßengesetz 1971) basically rules, that any kind of notice and advertisement (acoustic and visual) may not be installed within 100m on each side of the Federal Road (either a motorway or an expressway). Exceptions may be granted by the Federal Roads Administration (that is the Autobahnen- und Schnellstraßen-Finanzierungs- Aktiengesellschaft - "ASFINAG") if notices and advertisements are of a general interest to the road user. All relevant legislation, especially Road Police Regulations, must be obeyed.
(<http://ris.bka.intra.gv.at/Dokumente/Bundesnormen/NOR40117109/NOR40117109.pdf>)
- **Service Instruction of the Federal Ministry for Transport, Innovation and Technology (bmvit) to ASFINAG:** "In protection zones according to Sect. 21 of the Federal Roads Act, illuminated notices and advertisements in line with Sect. 25 of the Federal Roads Act require a lighting expertise to be submitted to the Federal Ministry for Transport, Innovation and Technology by the applicant taking into consideration the relevant technical guidelines"
- **Austrian Road Traffic Act (Straßenverkehrsordnung):** According to paragraph 84, advertisements and announcements are forbidden within a distance of 100 m from the edge of the carriageway. However, authorities have the possibility to grant an exemption if:
 - o it is important for road users or
 - o at least of considerable interest for them or
 - o if drawn up in an area designated for building

and road traffic or road traffic safety is not likely to be endangered.

If the criteria mentioned above are met, has to be decided by the competent authority on a case-to-case basis. There are no guidelines on this subject.

The "Forschungsgesellschaft Straße-Schiene Verkehr (FSV; Austrian Research Association for Roads, Railways and Transport) did publish the following **guidelines** (Richtlinien und Vorschriften für den Straßenverkehr – RVS):

- RVS 05.06.11 Visuelle Störwirkungen – Kriterien zu Standorten von Informationsträgern (28p) (Dezember 2011) (**Visual Disturbances – Criteria for Signage Locations**)

<http://www.fsv.at/shop/produktdetail.aspx?IDProdukt=e5585780-720b-40cc-90f2-ac6ffd892b69>

- RVS 05.06.12 Visuelle Informationsträger für verkehrsfremde Zwecke (10p) (November 2003) (**Anti-Glare Boards and Noise Protection, Negative Impact on Road Safety, Visual Signage for Non Traffic Related purposes**)
<http://www.fsv.at/shop/produktdetail.aspx?IDProdukt=e5dab6e2-846a-40d9-9463-156a466c11a7>

These guidelines can be obtained from the FSV website at a cost: www.fsv.at

3.2.3.2. Cyprus

Based on input from the Department of Public Works, Ministry of Transport, Communications and Works, Cyprus. PWD is responsible for the main road network including all motorways and major roads and aims to ensure the management and operation of modern quality infrastructure for efficient service and safe movement of every Cypriot and foreign citizens as well as the provision of related services by utilizing all available resources and means in the most efficient and effective manner.

Documents:

Regulations are included in the **Road Safety Law for the Road Network:**

http://www.cylaw.org/nomoi/enop/non-ind/1986_1_174/full.html

The regulations apply to all roads and they are categorized in motorways, secondary roads and municipal or residential roads. References and rules are included for RsA.

A “promotional construct” is defined as: any form of sign and any form of construction, stationary mounted on the ground or a trailer or self-propelled vehicle on which or in which any advertisement or information is or is being affixed.

There are also **other laws governing local roads** that also include references and rules for adverts and commercial signs/billboard signs.

Procedure:

Currently only the local authorities and community councils can issue licenses to install adverts near the road network. They are the only ones who regulate this matter collecting the license and annual fees.

The procedure depends on the place of the advert:

- Advert (e.g. billboard) near the motorway network or a major city road under the jurisdiction of the Public Works Department (PWD): the local authority that issues the permit (not in all cases) sends the relevant application to the police and to PWD for comments.
- For all other adverts, each local authority or council sets their rules and fees and issues permits without obtaining the views of PWD, the police or others.

Adverts are mostly installed on private plots/land, meaning that if an advert is illegally installed it is not easy for Agencies or Governmental Departments to intervene and remove them.

Due to the uncontrolled installation and licensing of adverts on the road network by the local councils and municipalities, the national government attempts to combine all of the existing legislation on the matter and to regulate it via Town Planning Laws in order to allow stricter control and less anarchy on the installation of adverts along public roads, whether on the highway network or local road. This refers to the current development of new legislation.

Current developments:

New legislation is under way to incorporate RsA in the Town Planning and Ministry of Interior Laws but it needs to go to the Cyprus Parliament for voting and approval first. The documents cannot be circulated yet as they are processed by the Ministry of Interior and not the Ministry of Transport, Communications and Works.

Research needs:

Any further information, research or literature with regard to effects from Roadside Technology-based Signage, such as LED commercial signs for example, are very welcome. Their usage and negative effects are gradually increasing in Cyprus due to the lack of strict regulations and controlling measures.

3.2.3.3. Germany

Based on input from the Federal Highway Research Institute (Bundesanstalt für Straßenwesen, BASt), Germany.

Documents:

Legislation in Germany concerning light advertisements along roads is first to be found in German **Road Traffic Regulations** ("Strassenverkehrsordnung"). It says in Section 33 that "it is prohibited to display advertisements and publicity of any kind by means of pictures, script, light or sound outside built-up areas, if this is likely to distract or annoy road users, thereby endangering or impeding traffic. Nor must advertising and publicity within built-up areas cause traffic disruption."

Further, the **Law concerning federal roads** ("Bundesfernstrassengesetz") says in Section 9 that no facilities/structures may be brought up within 40m aside from federal motorways, as well as 20m aside from other federal roads outside built-up areas.

Procedure:

Based on this legislation, in general that there may not be any kind of advertisements within the given distances alongside motorways and federal roads. For other roads, there is no general guidance for the assessment. The reason is that Germany consists of 16 federal states. Outside built-up areas, if not on federal roads or motorways, it is up to the law of each federal state on its own. Inside built-up areas, it is even up to the cities' administration. So, "it may not distract or annoy road users" but assessment is up to local administrations without any further general guidelines. It is up to local administrations, so there are no general guidelines to be used.

3.2.3.4. Italy

Based on input from Anas S.p.A., Operation and Territorial Coordination Directorate - Transport Planning, Network Updating and Classification, Traffic and safety" office, with the contribution of:

- Operation and Territorial Coordination Directorate – Network Management - Licensing and Concessions Office: responsible for defining technical guidelines and relative assessments in support of the activities carried out by the other Directorates and territorial offices regarding licenses, concessions and advertising. The office is also responsible for ensuring the examination and technical investigation of paperwork relating to fuel plants (excluding motorways), crossings of state roads, construction of grafts and/or intersection.

- Commercial Directorate - Commercial Services - Licensing, Concessions and Advertising Office: responsible for ensuring the definition of administrative guidelines for licenses, concessions, advertising authorizations, accesses and subservices, the issue of authorizations for advertising campaigns throughout the country, the implementation of new commercial opportunities and the signing of agreements with big customers.

Anas is a joint-stock company that operates on a national and international level with Ferrovie dello Stato Italiane as its sole shareholder. Anas is also subject to the auditing and technical-operative supervision of the Ministry of Infrastructure and Transport.

The company manages over 26.000 km of Italy's national road and motorway network, with projects aiming to expand and develop this network and infrastructural investment plans of approximately 3 billion Euro per year.

Through a network of 20 Regional Monitoring Centres, a National Monitoring Centre and a fleet of over 1.000 vehicles equipped with cameras and GPS, Anas also continuously monitors its roadway infrastructure to ensure safety and the smooth flow of traffic, while coordinating the activities of its operating personnel.

Documents:

The relevant regulations are included in:

- Art. 23 of the **Highway Code** ("Road and vehicle advertising"):
<http://www.altalex.com/documents/codici-altalex/2014/10/22/codice-della-strada>

Article 23 "Advertising on roads and vehicles" states ... that it is forbidden to place advertising along roads or in view of roads when they are visible from the passing vehicles on the road... This refers to devices which in terms of size, shape, colours, design and location can lead to confusion with road signs, or can make it difficult to understand or reduce the visibility or effectiveness of road signs, or cause visual disturbance to road users or distract their attention with consequent danger to the safety of traffic... The affixing of luminous inscriptions or advertising signs on vehicles is also prohibited. Reflecting advertising slogans or signs on vehicles are permitted within the limits and under the conditions laid down in the Regulation, provided that there is no risk of glare or distraction for drivers of other vehicles.

- Art. 47 to art. 59 of the relevant **Execution and Implementation Regulation**:
<http://www.altalex.com/documents/codici-altalex/2013/08/30/regolamento-di-esecuzione-e-di-attuazione-del-codice-della-strada>

The Regulation lays down the rules for size, characteristics and location of RSA along roads and in specific zones.

Procedure

In Italy, the basic rule is that placing signs and other means of advertising on the edge of the road or in the view of roads is subject to authorization by the local, regional or national authority that manages the road, in compliance with the standards laid down in the Highway Code and the implementing regulation.

Outside the built-up area, Anas, the region or the province is responsible depending on who is the body owning the road. Within the built-up areas, responsibility lies with the municipalities, except for the technical approval of the owner if the road is state, regional or provincial. Within built-up areas, the municipalities have the power to grant exemptions to the rules regarding minimum distances for the positioning of RSA, in compliance with road traffic safety requirements.

In practice, the company that exercises the activity of operator in the field of RsA sends the application for authorization to install the advertising medium to the authority owner or manager of the road. This application must be accompanied by a design and a stability check with particular reference to wind tipping.

For roads managed by Anas S.p.A., the authorization application forms can be downloaded from the company's website (<http://www.stradeanas.it/it/modulistica-0>).

After obtaining the relevant authorization the applicant may install the advertising medium in compliance with any prescriptions provided and is obliged to pay an annual fee.

For fixed advertising systems the authorization is valid for 3 years and, before expiry, a new authorization must be requested, the validity of the authorization for temporary advertising equipment varies from 1 to 365 days

Any form of advertising along and in view of the international routes, the motorways and main suburban roads is forbidden. On such roads advertising may be installed on parking or service areas, provided that they are not visible from the road.

Finally, one of the peculiarities of Italian legislation is that even the simple signage of a shop, restaurant or production plant is considered "advertising"

3.2.3.5. Lithuania

Based on input from the Lithuanian Road Administration, Ministry of Transport and Communication (Lietuvos automobilių kelių direkcija; LAKD).

Documents:

RsA is regulated by the Law on Advertising and Law on the Roads of the Republic of Lithuania.

- **Law on Advertising** : <https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/dd69e1e2a58711e59010bea026bdb259?jfwid=q86m1vre1>
- **Law on the Roads of the Republic of Lithuania** : <https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.220950?jfwid=-n126u3scv>

Procedure:

The Law on Advertising – Article 12. Requirements for mounting outdoor advertising – stipulates that: “Outdoor advertising shall be prohibited ... on motorways, above motorways, in traffic lanes and in protection areas, except for stands informing traffic participants about the condition of the road. Outdoor advertising shall be prohibited in and alongside streets if it might obstruct technical traffic regulation means, reduce visibility, blind traffic participants and pose danger to traffic participants. It shall also be prohibited to use advertising that imitates road signs and/or uses road sign symbols. Advertising mounted in breach of such requirements must be removed, demolished or dismantled without compensating for losses to the owner thereof or at the expense of the persons that have mounted such advertising.”

The Law on the Roads – Article 12. Road protection area – stipulates that: “In order to provide safe traffic conditions, the road protection area shall be established on both sides of the road edges. According to the category of the road, its width shall be as follows:

- main roads – 70 metres;
- national roads – 50 metres;
- regional roads – 20 metres;
- roads of local significance, categories I-III – 10 metres
- roads of local significance, category IVI – 3 metres.”

There is no permission procedure. Advertising in the road protection area is forbidden, without exemptions.

3.2.3.6. Luxembourg

Based on input from the National Road Administration (Administration des ponts et chaussées, Ministère du Développement durable et des Infrastructures, Gouvernement du Grand-Duché de Luxembourg). The Administration manages 165km of highways and 20 tunnels.

Documents:

Advertisements for events (short time) and for publicity are distinguished. For each type there are different rules to be applied and these are based on a law. So each request for advertisement is assessed by these regulation.

All the relevant documents for authorization of RsA can be found on the link:

<http://www.pch.public.lu/fr/organisation/attributions-competences/permissions-voirie/index.html>

- The **Law on road permissions** December 21st 2009 :
<http://legilux.public.lu/eli/etat/leg/loi/2009/12/21/n1/jo>
And guidance for application: <http://www.pch.public.lu/fr/organisation/attributions-competences/permissions-voirie/index.html>
- **Road Code** Article 113: ... “no signs or panels resembling the form, colours or dimensions of road signs and close to road signs no illuminated devices which can harm their visibility and efficacy”...
- **Specific safety related regulations** for certain types of RsA are described in guidance documents for applying the Law:
 - o variable message signs for public authorities, for cultural, social, sports events and city circulation info: <http://www.pch.public.lu/fr/organisation/attributions-competences/permissions-voirie/permissions-ministerielles/tome-1/tome-1-avenant-1-panneaux-messages-variables.pdf> ,
 - o publicity signs along the roads for ‘balls and parties’; private publicity signs for restaurants and shops (Ministry of Public Works - Bridges and Roads Administration - Direct road permits (1998):
<http://www.pch.public.lu/fr/organisation/attributions-competences/permissions-voirie/permissions-directes/1ere-partie/VIII-enseignes-publicitaires.pdf>)
The section on events (balls, parties, manifestations) refers to the risk of distraction and defines several safety related criteria.

Procedure:

To execute works/constructions along a road, an authorization is needed. These authorizations (“permissions de voirie” or Road permissions) are given by the Ministry of Sustainable Development and Infrastructures, Department of Public Works, National Road Administration:

- "Division de l'exploitation de la grande voirie et de la gestion du trafic" for motorways and expressways (DGT)
- Division de la Voirie Luxembourg » (DVL) or « Division de la voirie Diekirch » (DVD) for other the state owned roads

RsA is a part of all "Road Permissions".

Depending on the road-type, the State does or does not allow the posting of advertisement within a certain distance of the road. And these advertisements underlie a certain number of rules, which are to be respected.

- Motorway: RsA no allowed
- National Road: Permission needed for device within 25m from roadside
- Other Road: permission needed for device within 10m from the roadside

Research needs:

They are very interested in questions related to luminance and LED.

3.2.4. Short overview of RsA procedures (CEDR) – not validated

3.2.4.1. Estonia

Based on input from the Traffic Safety Department, Estonian Road Administration, Republic of Estonia.

Documents:

Advertisements and non-traffic information signs are regulated by 2 laws:

1. **Roads Act** §5³: <https://www.riigiteataja.ee/en/eli/513092017001/consolide>
2. **Building Code** § 70, 71 & 72: <https://www.riigiteataja.ee/en/eli/520062017015/consolide>

These regulate what and to what extent can be done in road protection zones.

Procedure:

In the protection zone of a road, it is prohibited to install any lighting equipment, information or advertising device that disturbs traffic on the road.

The width of the protection zone is as follows:

- European road network: up to 50m from the outer edge of the outermost lane on both sides of the road.
- Other roads: up to 30m from the outer edge of the outermost lane on both sides of the road. The owner of the road may reduce the width of the protection zone where this is warranted by the circumstances.
- Street: up to 10m from the outer edge of the outermost lane on both sides of the street. This may be extended to up to 50m where this is stipulated in the spatial plan.

Concerning LED advertisement displays, Estonia is in an early stage; on national roads there are not many but on rare cases they have used the Tallinn city conditions/criteria for approval:

- The device should comply with ETS-EN 12464-2: 2007 environmental standard E3: "... In the dark, the light intensity must be brought to a reasonable minimum. The Transport Board reserves the right to request additional reduction of luminous intensity in order to ensure road safety in the area. It is sensible to use an auto adjustment device that changes the brightness of the screen according to outdoor lighting.
- Moving image or video is not allowed.
- A smooth (slow) movement of individual image elements is allowed (a change).
- Changing the entire screen width is not more often than every 10 seconds.
- Flashing effects (or alike) are not allowed."

In addition, there have been discussions that on higher speed roads the minimum time of changing the images should be multiplied by 2, but that is still just an idea. At the moment, Estonia does not have any special regulations about LED advertisement displays.

Current developments:

The Road Traffic Management Department of the Estonian Road Administration is also putting together advertisement **guidelines** which are not yet officially adopted. These include road safety related criteria. The draft version includes placement criteria like:

- If there is a curve with a radius <700m, RsA devices may not be located within 50m from the start and at less than 50m from the end of the curve;
- RsA may not be located within 50m from an intersection and may not be placed within the visibility triangle;
- The distance between advertising devices in the road protection zone is minimum 50m;
- RsA may not be installed <50m in front of a road sign (except certain signs);
- RsA may not mislead the road user and may not hide a traffic control device;
- The distance between advertising device and road edge is at least 12m;
- LED screens may not be installed in the road protection zone;
- RsA along a motorway may not be parallel to the axis of the road.
- RsA may be installed on a national road/street when certain conditions are met (maximum speed limit ≤50km/h...)

3.2.4.2. Finland

Based on input from the Finnish Transport Agency. The Finnish Transport Agency is responsible for the state-owned road network.

Documents:

In Finland, there is a guideline (or order) to follow when it comes to advertising along the roads. It was updated last year, and contains to some extent also digital advertisement matters.

Regulation RsA (2016): The Finnish Transport Agency has issued the Roads Act of 23 June 2005 (503/2005) pursuing to Section 52b, as it reads in Law 566/2016:

https://julkaisut.liikennevirasto.fi/pdf8/lm_2016_tienvarsimainos_web.pdf

It gives information for the road authority on the procedures and road safety related criteria concerning the position of RsA and technical requirements: placement, minimum distances, layout, size, illuminated ads, self-reflecting ads, variable content ads.

3.2.4.3. Hungary

Based on input from the Department for road infrastructure development, Ministry of National Development, Hungary. The Ministry is responsible for 30.000 km of state roads (including 1.300 km motorways).

Documents:

The main legislative links are:

- 12 § of **Act I of 1988 on Road transport**:
http://njt.hu/cgi_bin/njt_doc.cgi?docid=9588.330170
- 224/2011 (X. 21.) **Government Decree on the detailed rules for the placement of advertising boards, advertising media and other advertising equipment on public roads**: http://njt.hu/cgi_bin/njt_doc.cgi?docid=140008.316693

There are main differences in the legislation on rural roads vs. inside built-up areas.

Procedure:

The road management company gives contribution (with special conditions) on rural roads and local municipality in built-up areas according to the legislation.

3.2.4.4. Iceland

Based on input from the Icelandic Road and Coastal Administration (IRCA), the responsible authority for the State road system.

Documents:

Article 43 in the **Icelandic Law of the Conservation of the Nature** (No. 44/1999)
<https://www.althingi.is/lagas/144b/1999044.html>:

It is not allowed to put up advertising signs adjacent to roads or elsewhere in rural areas. However it is allowed (certain rules have to be fulfilled) to put up simple signs that give information on certain services available along the road, such as :



Article 32 in the **Icelandic Roads Act** (No. 80/2007):
<https://www.althingi.is/lagas/nuna/2007080.html>

It is not allowed to put structures (includes advertising signs/billboards other than the simple signs mentioned above) of any kind closer to the centreline of main roads than 30m, and closer than 15m for other roads, without a permission from the road owner. The road owner can decide that this distance is greater than 30m and he can also decide that the distance is shorter than 30m at certain sections of the road.

In practice this means that if someone wants to put up an advertising sign along the road the road owner will refuse the request on the basis of the Icelandic Law of the Conservation of the Nature.

For intersections: It is not allowed, without the permission of the road owner, to put structures of any kind within an area which is delimited by straight lines between points on the

centreline of the roads, in question, 40m from their point of intersection. The road owner can under certain conditions decide that this distance is as long as 150m.

Procedure:

The design of RsA has to fulfil conditions in regulations on planning and structures which are under the jurisdiction of different municipalities.

The IRCA is concerned about the increased use of LED advertisement because of negative effects on road safety. Even though the signs themselves are not located too close to roads, (see the conditions in the Icelandic Roads Act above), their brightness may very likely distract drivers and decrease road safety. The IRCA has referred to a recent Danish report (Herrstedt et al., 2017) in this context.

This is the reason why the IRCA, recently, has sent a letter to different municipalities and informed them of these concerns. The IRCA is totally against LED RsA which is directed towards drivers on state roads.

3.2.4.5. Malta

Based on input from Transport Government Malta (TM).

Documents:

The relevant legislation behind RsA is:

- **Subsidiary Legislation (SL) 499.32:** Placing of billboards and advertising on the road regulations
- **Legal Notice (LN) 103/2016:** Environment And Development Planning Act – “Billboards and advertisements regulations, 2016”

The SL 499.32 “Placing of billboards and advertising on the road regulations” has been replaced by (LN) 103/2016 “Billboards and Advertisements Regulations, 2016”.

The scope of replacing SL 499.32 was to abolish any mention of temporary billboards and timeframes (approvals limited in time), since it was being noted that this system was being abused and billboards were being placed on the road legally without any checks and balances and no effective enforcement could be made. A license fee of €1.500 was introduced to further reduce illegalities.

Since 2018, a new Legal Notice is in place:

- **Legal Notice (LN) 36 of 2018** (Development Planning Act, CAP. 552, Billboards and Advertisements Regulations, 2018):
<https://www.gov.mt/en/Government/Government%20Gazette/PA%20Legal%20Notice%20Documents/2018/LN%2036%202018.pdf>

This LN includes guidelines (parameters and criteria) for assessing RsA permit applications, to ensure that outdoor advertising is of a high design standard that will not have a visual impact or affect road safety conditions. They are more strict than the old guidelines taken up in the SL 499.32 and include in addition a set of criteria for electronic advertising billboards.

In the guidance, a differentiation is made between general RsA (no billboards), billboards and electronic billboards. The LN states that in assessing whether any particular site is suitable for the display of billboards, the general considerations should be traffic safety, land

use of the area, the scale and massing of existing buildings and whether there are any features of environmental, architectural or historic interest in the vicinity.

Together with the general principles for the location of advertisements, advertisements must conform to the road safety criteria set out by Transport Malta. The appendix of the LN includes: "Transport Malta technical conditions for the placing of non-electronic Billboards" (20 criteria) and "Transport Malta conditions for the placing of electronic advertising billboards" (24 criteria).

Coupled with the criteria in the LN, proposals for electronic billboards are only considered following the clearance from Transport Malta which includes:

- Techniques of message display.
- The transition time required.
- Number of picture changes per minute.
- Maximum luminance at various times of the day/night.

Procedure:

Application for a permission is needed for RsA (also advertising vehicles) at any place which is visible from the road.

Billboard on Government / private land:

- The applicant decides where the billboard is to be placed, and applies with the Lands Department.
- The Lands Department gives its no objection to proceed with the application (only applicable for billboards on Government land).
- The applicant's Architect submits relevant documentation and fees to the Malta Environment and Planning Authority.
- The Planning Authority carries out a consultation with all relevant authorities (including TM) for the application to be reviewed in accordance to current policies.
- If application is accepted, an encroachment fee is paid to the Lands Department (which fee depends on the area of land being used) – only applicable for billboards on Government land, and a yearly license fee of €1.500 is paid to TM.

TM issues a license which is to be affixed to the billboard structure in order to facilitate enforcement action should this be required.

RsA on the road or visible from the road without a permission are removed by the Planning Authority without the need to issue an enforcement notice.

3.2.4.6. Norway

Based on input from the Norwegian Public Roads Administration (NPRA).

Documents:

The **Roads Act** (1963) includes general provisions on RsA:

(https://lovdata.no/dokument/NL/lov/1963-06-21-23?q=vegloven#KAPITTEL_9)

Section 33 "Advertising Section" contains the main provision on advertisement along public roads. It indicates that it is necessary to apply for a permission (licence) to put up advertisements directed towards public roads/visible to road users. Permission to set up advertisement may be granted if such advertisement is not considered to be hazardous to

traffic. Advertisement that is considered hazardous to traffic means advertisement that may distract road users, block visibility or be confused with road signs/traffic lights/road markings.

There are separate “**Regulations on the prohibition of (technology-based) variable advertising along public roads**” (1990). These regulations say that advertisement where contents and message vary more than once per 24 hours is forbidden along roads outside built-up areas. In built-up areas, where the speed-limit is 50 km/h or lower, such advertisement is only forbidden at roundabouts and signal-controlled intersections. ([https://lovdata.no/dokument/SF/forskrift/1990-05-23-380?q=variabel reklame](https://lovdata.no/dokument/SF/forskrift/1990-05-23-380?q=variabel%20reklame))

There are also provisions in other acts and regulations that are relevant with regard to RsA along public roads, such as in the **Road Traffic Act, the Traffic Signs Regulations and the Planning and Building Act**. Also, local police rules might apply.

In the **NPRA (2014) Manual V323 “Advertisement and Traffic Hazard”**, the legislation is explained in detail and the manual contains detailed road safety related **guidelines** for how NPRA case officers are to process RsA, pursuing to section 33 of the Roads Act. The relevant parts apply to “public roads” (chapter 4), i.e. they apply to all public roads whether they are municipal, county or national roads. The rules are the same regardless of road category, but the assessment of whether an advertisement is hazardous to traffic depends on factors such as speed limits, traffic patterns, traffic density and accident history at the site where the RsA is intended to be placed. (<https://www.vegvesen.no/attachment/61470/>)

Procedure:

Every RsA needs a specific permission. The regulations for RsA apply to all devices that can be seen by road users (drivers, cyclists, pedestrians). The advertising distance to the road does not matter.

Whether a sign can be placed is up to the local road administration.

NPRA has developed a very comprehensive set of safety related guidelines to help deciding on this. The rules for RsA are enforced by the relevant road authorities.

3.3. Outside Europe: Australia and New Zealand

Well documented legislation and guidelines are available for Australia and New Zealand which was the main reason to include both countries in the current review. The information for Australia and New Zealand was directly retrieved from a review by Austroads (Austroads, 2013). Austroads comprises road authorities in both Australia and New Zealand. Both countries are discussed together. A complete overview of the safety related criteria in both countries according to our framework can be found in Annex D.

Documents:

- Austroads (2013). Impact of Roadside Advertising on Road Safety (AP-R420-13). Sydney, Retrieved from: <http://scenic.org/storage/PDFs/austroads%20research%20report%20on%20impact%20of%20roadside%20advertising%20on%20road%20safety.pdf>
- NZ Transport Agency (2011). Traffic control devices manual. Part 3 Advertising signs. Wellington, Retrieved from: <https://www.nzta.govt.nz/assets/resources/traffic-control-devices-manual/docs/part-3-advertising-signs.pdf>

Procedure:

The development of outdoor advertising in Australia and New Zealand is regulated by state road authorities, state planning departments and local governments.

The approval process depends on where the structure is envisaged to be placed. Road controlling Authorities (RCA) are responsible for approving road side advertising (design and location) and removing non-complying roadside advertising located within the road reserve under their control.

Territorial Authorities (TA) (e.g. states, cities, regional councils) are responsible for approving advertising that may be located beyond the road reserve but which can still be seen by passing road users.

4. Future trends

Information and communication technologies evolve rapidly and offer increasing possibilities, also for outdoor advertisement. Widespread availability of sensor and display technology at decreasing costs makes it more likely to be used for outdoor advertisement in the near future. The present section describes evolutions over time in the outdoor advertising market that might be of importance when considering the development of (updated) guidelines.

4.1. Approach

Identifying future trends in terms of RsA through a web-search is not straightforward as reliable information is not easily available. The necessity of an alternative source of information has reoriented our methodology from a literature review to semi-structured interviews of the main market players in the advertising industry and other advertising/marketing specialists.

The following companies/associations were identified or recommended within the consortium:

- Clear Channel: 760.000 billboards around the world, active in 16 European countries
- JCDecaux: Leader in billboards and street furniture across the world
- Daktronics: International company, active in 6 European countries
- RCA group: Communication/marketing company active in Belgium for over 40 years.
- AEA (Association d'Entreprises d'Affichage): Association of advertising companies

It was decided to conduct semi-structured interviews with contact persons within these organizations. An overview of the interview structure can be found in Annex E. The main topics covered in the interview were:

- Main evolution in outdoor advertising last 50 years:
 - o Evolution in RsA
 - o Opinions about road safety criteria in guidelines/legislation
- Future innovations that can be expected on medium term
- Specific challenges linked to these future developments
-

4.2. Main outcomes

Mobilizing the market players and advertising specialists for ADVERTS was not very successful as most of our contacts did not respond after multiple requests (e-mails and phone calls). Only one interview could be organized, with the Development Director at Clear Channel Belgium. The interview was conducted face-to-face at the Clear Channel's office in Belgium, and lasted about one hour. The results of this interview are described underneath.

It is a limitation that the input for future trends comes from one industry source, one advertising company, in one country. Therefore some trends and practices that are effective in other countries or other advertising companies may not appear in the main outcomes below. Nevertheless, Clear Channel can be considered a world leader in RsA.

The interview results were validated.

4.2.1. *From uncontrolled advertising to partnership with road authorities and cities.*

The outdoor advertising industry has faced a lot of changes in the last decades, but we can identify three major evolutions:

1. The use of wooden panels of 20m² as official advertisement poster support. As these panels were more convenient than the former painted walls, their number increased very fast after the second world war.
2. In the 1960's outdoor advertising was divided into 2 "segments":
 - Appearance of first 'higher quality' billboards: disappearance of the wooden panels and replacement by illuminated billboards.
 - Appearance of advertising on street furniture with a changing business model: the advertising company invest in the furniture and the maintenance in exchange of advertising.
3. Recently, outdoor advertising companies become more aware of the digital transformation in media and feel the need to digitize some of their assets. The purpose is to offer a flexible and relevant way to communicate with citizens and customers.

These three major steps show how the relation between road authorities and outdoor advertising companies has changed. Before the end of the 50's, there was no contact between them because there was no regulation of outdoor advertising.

Slowly the first permission procedures were implemented. Road authorities and cities set up specific procedures to authorize the installation of advertising billboards and street furniture.

In the near future, relations will become more complex as outdoor advertising companies are becoming more and more a partner in city development. Cities want to invest in "smart city" infrastructure, and outdoor advertising companies see this as an opportunity to broaden their scope. "Smart city" is a very popular concept with no general definition, but some common characteristics. One of these is sometimes used as criterion to distinguish smart cities from other cities: the use of ICT to enhance the sustainable management of the city's resources and improve their services and activities.

Outdoor advertising companies are therefore a good partner for the development of smart cities:

- They can integrate different sensors (for example: pollution sensor, traffic monitoring devices,...) in their "smart" billboards or street furniture that collects useful data for the city development, the improvement of services and the development of new services.
- Billboards can deliver services (interactive billboards, free wi-fi, ...) or useful information (traffic congestion, air pollution, ...) to citizens.

4.2.2. *Legislations and guidelines: lack of uniformity and not up to date*

There are big differences in regulation between countries or even within countries. This is also reflected in differences between permission procedures and their actual application. While the advertising industry observes the introduction of digital billboards since 2010 in some countries (e.g. the UK), other countries are still very restrictive on that point.

According to the interviewee, the different legislations are too restrictive towards digital billboards:

- Road authorities should distinguish between high quality and low quality digital billboards. Thanks to specific sensors, the brightness of screens can be influenced in accordance with the environment. The major advertising companies always use such high quality billboards (with sensors) and apply effective maintenance procedures whereas small industry players are more willing to use low cost material and do not have the resources for good maintenance.
- Road authorities do not always make the difference between a small 2m² digital screen, intended for pedestrians and which can give other information, and bigger digital screens intended for drivers. Authorities should make a difference between the digital formats, the asset type and the location (pedestrian or roadside digital).

As low quality digital billboards are cheaper, their number might increase in the coming years and this may lead to road safety problems (we observe already some of them mounted on trailers or vehicles along the roads). According to our interviewee, road authorities should make a categorisation between types of digital advertisement and develop clear quality criteria for digital billboards (including maintenance criteria).

4.2.3. *Digital billboards & roadside advertising*

The number of big roadside billboards is decreasing and this evolution will continue. Outdoor advertising companies want to use digital advertising, but digital billboards are costly and will never replace every traditional billboard. Therefore, companies are more willing to develop digital displays integrated in street furniture (for pedestrians) and invest in a few digital “roadside” billboards (for drivers). The bigger digital billboards have to be located on the right place. Criteria used for the location of digital billboards are:

1. Retail locations = pedestrians in a shopping context
2. Traffic criteria= high traffic intensity & low speeds

4.2.4. *Towards Digital Out Of Home (DOOH) & multifunctionality*

Even if traditional advertising will continue to exist along roads, outdoor advertising companies will invest more and more in Digital Out Of Home (DOOH). The principle of DOOH is flexibility: bring the right message on the appropriate location, at the most adequate moment. Billboards used for DOOH are digital billboards and a central computer unit determines what, when and where adverts should be visible.

DOOH does not mean one-to-one communication but appropriate flexible mass communication, for example:

- Having adverts for coffee in the morning, adverts for soft drinks in the afternoon and adverts for an aperitif late in the afternoon.
- Having adverts for toys near schools between 8-9 am and 15-17 pm.
- Having an advert for ice-creams when it is warm weather, an advert for umbrellas when it is raining and an advert for hot chocolate when it is cold.

Besides the DOOH, billboards will become more and more multifunctional. Outdoor advertising companies can integrate different ICT-modules (sensors, tools,...) in their billboards and in digital street furniture. Becoming multifunctional, DOOH will deliver other services to the authorities or the inhabitants. Some examples of those services are: integration of interactive screens, with wayfinding applications; integration of e-chargers, integration of free wi-fi, etc.

According to the interviewee, outdoor advertising will remain a mass-communication media, as one-to-one communication is only possible through the passerby's smartphone or other connected device.

4.2.5. How can public authorities anticipate future challenges?

Outdoor advertising companies are supporting the development of guidelines at a European level with specific attention points in function of the technology used.

Permission procedures should take these attention points into account in order to have only high quality digital billboards and maintenance guarantees from the outdoor advertising companies (continue monitoring & short intervention delays in case of problems).

In some cases, digital or other displays might have an impact on road safety. The real impact however should be measured and a difference should be made between high traffic roads, local streets and pedestrian areas. The legislation should be based on different scenarios, based on the location, the impact and the type of digital display.

Too restrictive legislation might impede the development of smart cities applications. Outdoor advertising companies indicate to be willing to invest in smart cities applications by means of smart billboards and smart street furniture. The future challenges of cities are extremely big and a workable regulation will help all the stakeholders to develop innovative tools to enhance City life.

5. Conclusions

The overview of the current practices demonstrates a large variety regarding legislations, permission procedures and guidelines in different countries.

5.1. *Permission procedure*

Mostly, permissions can be given by the road administration or by another authority or department depending on the location of the advertising device. The most common permission framework is the following:

- Advertising device along the main road network:
 - o Permission delivered by the road authority if the device is located within a certain area along the road (called the road protection area, road reserve,...) and on public land.
 - o Outside this area or on private land, permission is not delivered by the road authority.
- Advertising along the underlying road network = permission is not delivered by the road authority.

Permissions of advertising along road networks are consequently usually not totally under control of the road authorities.

In some cases, the road safety authorities can advise the other authority/department but most of the time their advice remains non-binding.

Sometimes the road safety authorities do not grant permits at all, for example:

- In Cyprus, only local authorities and community councils grant permissions for RsA. The public work department and the police are sometimes asked for (non-binding) advice when the device is located along the main road network.
- In Lithuania there is no permission procedure, RsA is prohibited along motorways and within the road reserve of other roads.

The permission procedure is typically written in laws; the criteria to grant permits or not are generally defined in guidelines and legislation or sometimes only in legislation. A few countries only have guidelines to assess whether or not a permit is granted.

Relatively little harmonization exist for procedures and criteria between countries but also inside countries.

Conflicts of interest might appear when authorities at the same time are responsible for granting permissions and can earn money with RsA.

Furthermore, the criteria used to give permission are not always transparent and appeal procedures do not exist or are not always efficient.

5.2. *Legislation*

Legislations defines the permission procedure for RsA: who gives permission, how, when and where. Sometimes other criteria for the placement or the design of RsA can be

mentioned in the legislation. Most common safety related characteristics covered by the legislation are:

- Placement criteria: Lateral distance, longitudinal placement and road environment
- Design criteria: Colour, content, luminance and dimension

Placement criteria are mostly covered by legislation. This is quite logic as the permission procedure and mechanism is mostly linked to lateral distances to the road and the road environment. Within the design criteria, the legislation typically focuses on the fact that advertising should not look like official road signs (mainly colour, content and shape) and should avoid to cause glare.

Even if the overall idea is very similar, the level of detail can vary from one country to another:

- The content of the text can be very vague leaving a lot of space for interpretation. For example: “may not cause glare” or “may not look like road signs” are commonly found in those texts. Involved parties might try to interpret these descriptions in different ways.
- Sometimes texts can be very detailed when it comes to luminance levels or dimension criteria for example. However, texts might become outdated or incompatible with new technologies or advertising techniques.

5.3. Guidelines

Most of the European countries have specific guidelines linked to RsA or (dangerous) objects along the roads. Guidelines only discuss the criteria to assess if a RsA can have road safety consequences or not. They do not give any recommendation on the procedure. They are almost always complementary to legislation, sometimes specific to a type of road or advertising device.

Common subjects covered by the guidelines are slightly the same as those covered by legislation. Guidelines can be vague on certain points but they are rather meant to be detailed and more nuanced than legislation. A good example of detailed and nuanced guidelines are the ones from CROW in the Netherlands. Every criterion is discussed and adapted in function of the type of road. Also, the importance of the different criteria changes in function of the type of road, making differences between essential criteria, important criteria and criteria to consider.

The main advantages of guidelines as compared to legislation are:

- Possibility to be more detailed and nuanced than legislation
- Easier to adapt and to keep up to date
- Transparent document

The main disadvantage of guidelines as compared to legislation is that they provide a less solid framework and the same guidelines still might lead to different interpretations of similar situations.

5.4. Future trends

We are now in a new era of outdoor advertising, marked by strong competition with personalized advertising solutions offered on internet and the restrained open space. These

2 elements are leading outdoor advertising companies to invest in Digital Out Of Home (DOOH). DOOH opens the door to flexible outdoor advertising possibilities: advertise the right product on the right moment and on the right place. The content of digital billboards is managed by a central computer unit and is (can be) adapted minute to minute.

Consequences of DOOH on RsA billboards are:

- A multiplication of 2m² digital billboards: these billboards can be interactive but they are mainly addressed to pedestrians.
- Increase of roadside digital billboards, only on a selected number of locations.
- The number of traditional roadside billboards might decrease, but it is not likely that these conventional roadside billboards will disappear soon.
- Billboards can contribute to the development of smart cities by integrating sensors that collect useful data (traffic date, air pollution, ...).
- The number of cheaper low-quality digital advertising billboards might increase in the coming years and this may lead to road safety issues. These cheaper billboards are not equipped with sensors that adapt the brightness of the screen to the environment, and the companies that are installing them might not have an efficient maintenance program for these billboards.

Although DOOH remains mainly a mass communication media, there are already examples of one-to-one communication with passersby's without passing through their smartphone. Sensors can make digital billboards able to recognize individual people and display individually targeted content. Also, the content display may take some spectacular appearance as some advertising billboards integrate augmented or virtual reality – interacting with its environment and the pedestrians passing by the billboard. It is uncertain to what extent one-to-one communication and interaction will be applied to roadside advertisement in future.

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Annexes

A. Current practices: e-mail survey

Dear CEDR partner/colleague,

I would like to ask your input for the CEDR project ADVERTS – Assessing Distraction of Vehicle drivers in Europe from Roadside Technology-based Signage – which was granted in the scope of the CEDR Transnational Road Research Programme 2016, and is funded by Belgium-Flanders, Ireland, Netherlands, Slovenia, Sweden and United Kingdom. I am chairing this Project's Executive Board.

The aim of the CEDR Transnational Road Research Programme is to improve the knowledge and experience of National Road Administrations in the field of road safety in such a way that the NRA's are able to improve their Guidelines, Standards and Network Strategy. ADVERTS specifically aims at developing Europe-wide evidence-based recommendations for the safe use of Road Side Advertisement (to minimize distraction), with a special focus on digital advertisement. The research team includes SWOV (Netherlands), TRL (United Kingdom) and Vias institute (former BRSI, Belgium).

In order to optimally align the ADVERTS recommendations with existing practices, an inventory of current practices and existing guidelines in the different CEDR countries is needed.

You are our contact person for safety issues, so I kindly ask your input on the following questions:

Do you have legislation or recommendations with regard to using/permitting Road Side Advertisement in your country?

- **If yes**, can you please send us the relevant documents and/or links, preferably in English, but if not available, in your own language. We are particularly interested in overview documents (scope and content of legislation/recommendations).
- **If there are current developments** or plans related to legislation in this area, can you please (also) send us documentation (or write a few lines) on this?
- **If not**, can you please say in a few lines what the current practices for road side advertisement are?

Please send back your responses to me, also with the other ADVERTS project members in cc.

If you think somebody else is better suited for these questions or can provide additional input, please forward this e-mail to this or these person(s), with me and the other ADVERTS project members in cc.

Preferably we get your answer within the next 2 weeks, **by 4th December**.

We hope to gather information from all the CEDR Members. Each contact person will be personally acknowledged in the final project report (unless anonymity is preferred) and will be invited for oncoming events.

If you have any question or remark, do not hesitate to contact us.

Looking forward to your answers.

Kind regards,

Herman Moning

B. Current practices: in-depth interview

ADVERTS: INTERVIEWS CEDR PEB MEMBERS

- Aim: to go into more detail (step 2) with the 6 CEDR PEB members
- Method: Semi-structured interview: face-to-face or telephone, max. 1 hr
- Aim = full overview of: current guidelines/regulations, content, scope, procedures, organisational frameworks – specifically on safety related criteria.
- Opinions and information needs

Interview base structure (v22/01/2018):

<<starting from the reply to the email survey question 1 (Do you have legislation or recommendations with regard to using/permitting Road Side Advertisement in your country?) >>

- **You sent us several documents/links with regard to guidelines and/or regulations for permitting RsA. Can you please summarize in a few words each of these documents/links that you sent (source, content)?**
- **Can you explain what the general procedure is for getting/giving a permission for RsA? Including:**
 - o **Different scopes: road/area types** (which are not included)
 - o **Different devices:** different procedure? Do they all need a permission?
 - o **Different stakeholders involved:** Stakeholders behind the guidelines/regulations? Who delivers permissions? Advices? Audits? Obligation to follow advice?
 - o **Check table:** permissions and general laws. Corrections / feedback / additions?
- **Focusing on the RsA related guidelines/regulations (content): we are specifically interested in statements/criteria with relevance for road safety.**
 - o **Check table overview** of safety related criteria: “we inserted the e-mail survey input into a basic grid on safety relevant RsA placement and design criteria – input from guidelines and legislation ” Corrections / feedback / additions?
 - o **Scope?** To which roads and areas around roads do they refer? Which areas are not covered by guidelines/regulations? Different criteria based on different types of RsA and different devices?
 - o **Where these developed in scope of road safety consideration** or are they indirectly RS related?
 - o **What was the basis for these criteria?** E.g. research or observation/analysis of accidents? Expert consultation? Benchmarking - taken over from other countries? Other sources?
 - o **Have you done/ordered any investigation or study concerning RsA?** Could we gain access to the results?
 - o **Do you have (additional) (maybe more detailed) reference criteria for advising/auditing purposes?**
- **To what extent are the current guidelines used?**
 - o Usage and general acceptance ... by different (road) administrations?
 - o What are main problems/reasons for not considering the guidelines? E.g. income from RsA vs. safety...
 - o What about enforcement of unpermitted RsA – who enforces?
- **When were the safety related guidelines/regulations developed / last updated?**
 - o Are further updates foreseen in the near future?

- If yes: what is the reason behind
- Will they be more/less strict?
- Is there any investigation related to the renewal/update?
- **In case of “guidelines”: do you think these (or some) criteria should become regulations? Why yes/no? How?**
- **What were/are the force(s) behind developing guidelines and/or regulations for safely using/permitting RsA?**
 - Is this a hot topic politically / in society / in your road administration?
 - Evolutions in industry?
 - Do you know about incidences or accidents that were related to (digital) RsA (in your country)?
- **Do you have any other relevant experiences with digital RsA?**
- **To what extent do you think the industry is aware and willing to take safety related guidelines/regulations into consideration?**
 - Did they contribute to the current guidelines/regulations? Where they involved?
 - General acceptance?
 - Do they risk being controlled, fined... ?
 - Are you aware of evolutions in the RsA industry that (will) pose (additional) safety risks on the roads?

<<only when there was a reply to the email survey question 2 (If there are current developments or plans related to legislation in this area, can you please (also) send us documentation (or write a few lines) on this?) >>

- **You indicated that there are current developments or plans related to legislation in this area:**
 - **Is this already finalised/published meanwhile?** Can we get the doc/link? When is the publication foreseen?
 - **What was the reason behind?**
 - **Will they be more/less strict?**
 - *Related to which specific **GRID** criterion?*
 - **Is/was there any investigation related to this update?** What is the decision procedure for the new guidelines/regulations?
 - **Which stakeholders are involved in this procedure?**

<< we finalise with some general questions - for all >>

- **Can you say something about the prevailing opinions (pros and cons) about having recommendations/guidelines vs. regulation for RsA and what are the arguments?**
- **Is there (regular) (formal) discussion/consultation with industry about this topic? Or between different road authorities (if relevant)?**
- **Do you have particular information needs related to RsA?**
- **Is there anything you want to add, any comment?**

C. Road safety criteria for RsA in Europe

	Content covers the criterion
	No content found related to the criterion
	Information existing but not available (Austrian guidelines are to be purchased)
	Not validated / google translate content

Table C1: Overview of safety related placement criteria for RsA in Europe

Table 01: Overview of safety-related placement criteria for RSA in Europe							
Country	Documents	Placement Criteria					
		Longitudinal placement	Lateral distance	Vertical placement	Orientation viewing angle	Road environment	Other & general road safety statement
PEB countries							
Flanders	Guidelines: AWW	<ul style="list-style-type: none">• No digital billboard at complex locations• No digital billboard on a road stretch with high quantity of information	<ul style="list-style-type: none">• Digital billboards only allowed on the right side of the road	<ul style="list-style-type: none">• Digital billboards placed on eye level are not allowed. The bottom of the screen must be minimum 2m above the ground.	<ul style="list-style-type: none">• Digital billboards cannot be placed parallel to the road, the angle with the carriageway should be between 60° and 90°.	(see "longitudinal placement")	<ul style="list-style-type: none">• Quality control of the digital billboard every 5 years, by the owner.
	Legislation	<ul style="list-style-type: none">• Highway Code: Digital adverts with green or red colours placed less than 7m high, are forbidden within 75m from traffic lights.	<ul style="list-style-type: none">• Rooiljndecreet May 8th 2009; internal guidelines based on the former RD's of 1934: <u>Regional road network</u>:<ul style="list-style-type: none">- Within the "red line" (= public ground next to the carriageway), no advertising without permission from the road administration (AWV). No permission for billboards, permission are exceptionally given for signboards (<5m² not illuminated and not exceeding 4m height).- Within the "buffer zone" (private ground between the "red line" and the "building line"), no advertising without permission from the road administration (AWV). No permission for billboards, permission are exceptionally given for signboards (<5m² not illuminated and not exceeding 4m height).- Behind the building line, permission is given by the local authority.• Law of July 12th 1956; RD of June 4th 1958: <u>Motorways</u>:	<ul style="list-style-type: none">• Highway Code: Green or red coloured adverts, placed at less than 7m height, are forbidden within 75m from traffic lights.		(see "lateral position"): Distinction motorway/regional road	Advertising law: Advertising devices recognizable from protected tourist traffic routes and in protected landscapes are only allowed under very strict conditions (depending on the status of the road) that can be read in the advertising legislation. Signboards do not belong to the advertising law.

			- No advertising device in the "building-free zone" = within 30m from the carriageway				
Country	Documents	Placement Criteria					
		Longitudinal placement	Lateral distance	Vertical placement	Orientation viewing angle	Road environment	Other & general road safety statement
Ireland	Guidelines: Guidelines for Planning Authorities	<ul style="list-style-type: none"> Random parking of advertising truck trailers visible from the road should be regarded as a form of unauthorised advertising. 	<ul style="list-style-type: none"> Random parking of advertising truck trailers visible from the road should be regarded as a form of unauthorised advertising. 			<ul style="list-style-type: none"> Random parking of advertising truck trailers visible from the road should be regarded as a form of unauthorised advertising. 	<ul style="list-style-type: none"> GENERAL: National road network: RsA needs to be tightly regulated for road safety reasons. No VMS-devices for advertising on national roads.
	Legislation						
Netherlands	Guidelines	<p>RWS:</p> <ul style="list-style-type: none"> Devices may not mislead the driver (may not affect the forward view on the road course,...). Devices may not be placed within a certain distance from a complex traffic situation (this distance varies in function of the speed limit/road environment) <p>CROW :</p> <ul style="list-style-type: none"> No more than one billboards with rotating adverts in eyesight Devices may not be placed within a certain distance from a complex traffic situation (this distance varies in function of the speed limit/road environment) May not mislead the driver (may not affect the forward view on the road course,...) Has to be logic/fit in the road environment 	<p>RWS:</p> <ul style="list-style-type: none"> No advertising in the obstacle free-zone along the motorway (mostly 13m from the edge) <p>CROW:</p> <ul style="list-style-type: none"> No advertising in the obstacle free zone. The lateral distances varies in function of the type of road & speed limit (6 types of roads/areas distinguished). 	<p>RWS:</p> <ul style="list-style-type: none"> No overhead placement except on buildings and traverses that are min. 8m above the road <p>CROW: along road</p> <ul style="list-style-type: none"> not between 1,2m and 4m If bike path or sidewalk: >2,3m 	RWS & CROW: Seen from the travel directions, billboards should face the driver as much as possible: between 60° and 90°	<p>(see "longitudinal placement")</p> <ul style="list-style-type: none"> CROW: criteria are prioritized and adapted in function of the road environment (6 road/area types) 	RWS & NSVV: urbanistic/landscape environment
	Legislation						
Northern-Ireland	Guidelines						
	Legislation	<p>PPS 17:</p> <ul style="list-style-type: none"> May not obstruct or impair sight lines at corners, bends or at a junction or at any point of access to a road; May not reduce the clarity or effectiveness of a traffic sign or traffic signal; May not be placed when the footpath is narrow at the point where the public stop to look at them; 	<p>PPS 17 / Roads Act (RSPPG): May not reduce the clarity or effectiveness of a traffic sign or traffic signal.</p> <p>PPS 17: Signs have to leave sufficient lateral clearance for vehicles.</p> <p>Roads Order (RSPPG):</p> <ul style="list-style-type: none"> No advertisement primarily intended to be visible from a 	<p>PPS 17 / Roads Act (RSPPG): May not reduce the clarity or effectiveness of a traffic sign or traffic signal.</p> <p>PPS 17: Billboards have to leave sufficient clearance on or above any part of the</p>		<p>(see "longitudinal placement"):</p> <ul style="list-style-type: none"> May not obstruct or impair sight lines at corners, bends or at a junction or at any point of access to a road. <p>Roads Order (RSPPG):</p> <ul style="list-style-type: none"> May not interfere with navigational lights or an 	<p>Non-safety related criteria: Amenities criteria, Public safety & conservation areas of townscape characters and listed buildings;</p> <ul style="list-style-type: none"> RSPPG: Decision on (il)legality of mobile advertisement is up to the court of law.

		<ul style="list-style-type: none"> May not be located so as to impair road safety of any person looking at them because there is no protection from moving vehicles. <p>Roads</p> <p>Order (RSPPG):</p> <ul style="list-style-type: none"> No sign, advert on/in the road or on any structure/tree in/on the road 	motorway or other special road	road or footpath.		aerial beacon.	
Country	Documents	Placement Criteria					
		Longitudinal placement	Lateral distance	Vertical placement	Orientation viewing angle	Road environment	Other & general road safety statement
Slovenia	Guidelines						
	Legislation	<ul style="list-style-type: none"> Roads Act: Devices may be removed if they: ... reduce the visibility of the road, reduce the visibility of traffic signals or traffic equipment on the road, hinder traffic participants or reduce traffic flow. 	<ul style="list-style-type: none"> Roads Act: RsA (including electronic) not allowed in the buffer zone along state roads outside cities: e.g. 40m for motorways, 35m for highways, 25m for main roads (SIA) Roads Act / Rules on traffic signs and road equipment: In cities, RsA is not allowed in the area reserved for traffic signs. 			(see "lateral distance"): Distinctions by road type and outside/inside urban area	<ul style="list-style-type: none"> GENERAL: Roads Act: Devices may be removed if they... mislead traffic participants ... distract drivers. Has to be conform to the municipality spatial plan and environmental factors (no priority)
Sweden	Guidelines: STA	<p>In less complicated traffic environments, advertising may be permissible:</p> <ul style="list-style-type: none"> on long straight stretches of road without road signs or other elements which require time to observe; may not disturb the visual guidance of the road; may not obstruct visibility. 	<ul style="list-style-type: none"> Advertising device may not break or risk to end up on the driveway (not on guard rails, fences, etc...) VGU: Rules for safety distances or protection with guard rails 	<ul style="list-style-type: none"> No overhead placement allowed 	<ul style="list-style-type: none"> Road user should never lose the visual contact with the road (e.g.: no signs parallel to the road) 	<p>Advertising possible on stretches of motorways between junctions in a fairly long straight section:</p> <ul style="list-style-type: none"> Not in complicated traffic environments (e.g. intersections, junctions, tunnels, bus stops...) Display time in function of the speed limit and road environment. 	Two aspects are of interest in the assessment of advertising matter along roads, i.e. the place and the design of the advertisement. This applies both within and outside the road reserve.
	Legislation		<p>Roads Act: (permissions)</p> <ul style="list-style-type: none"> Permission for display within the road reserve given by STA Up to 50m outside road reserve: permission given by the county administrative board advised by STA. Beyond 50m outside the road reserve: county administrative board can transfer the decision to the municipality. 				

Other European countries (validated)							
Austria	Guidelines: to be purchased: http://www.fsv.at						
	Legislation		<ul style="list-style-type: none"> • Federal Road Act sect. 25: Any kind of notice/advertisement (acoustic and visual) may not be installed within 100m on each side of the federal road (motorway or expressway). Exceptions may be granted if the notices/advertisements are of general interest to the road user. • Road Traffic Act paragraph 84 : Advertisements and announcements are forbidden within a distance of 100m from the edge of the carriageway. Authorities have the possibility to grant an exemption if: <ul style="list-style-type: none"> • it is important for road users or • at least of considerable interest for them • if drawn up in an area designated for building 			(see "lateral distance"): Distinction by road type	For illuminated RSA - in line with sect. 25 of the Federal Roads Act: a lighting expertise is required taking into consideration the relevant technical guidelines.
Country	Documents	Placement Criteria					
		Longitudinal placement	Lateral distance	Vertical placement	Orientation viewing angle	Road environment	Other & general road safety statement
Cyprus	Guidelines						
	Legislation: Road Safety Law for the Road Network	<ul style="list-style-type: none"> • Motorway/fast road: Not allowed <40m from the edge line of the motorway Distance between 2 ads > 3km • Other road outside urban area: Not allowed <30m from a traffic junction Distance between 2 ads > 500m • Within urban area: Not allowed <20m from a junction, intersection or traffic lights Not allowed <20m from any road sign or pedestrian crossing Distance between 2 ads > 30m 	<ul style="list-style-type: none"> • Motorway/fast road: Not allowed <40m from the closest constraint of the road • Other road outside urban area: Not allowed <30m from the edge of the road • Within urban area: Not allowed at less than 3m from the edge of the road Not allowed at less than 15m from the edge of the road if frame is between 12 and 24m² 	<ul style="list-style-type: none"> • Motorway/fast road: Height <10m • Within urban area: Height <6m if frame does not exceed 12m² Height <8m if frame is between 12 and 24m² 		(See "longitudinal placement"; "lateral distance" and "vertical placement"): Distinction between 3 types of roads: motorways and fast roads, roads outside urban areas and roads in urban areas.	
Germany	Guidelines						
	Legislation	Road traffic regulations: • RSA by means of pictures, script, light or sound is prohibited outside built-up areas, if this is likely to distract or	Law concerning federal roads: • Federal Motorway: any structural engineering may not be placed within 40m from the edge			(see "longitudinal placement" and "lateral distance"): Distinctions motorways/federal roads	GENERAL: • RSA by means of pictures, script, light or sound is prohibited outside built-up areas, if this is likely to

		<p>annoy road users, thereby endangering or impeding traffic.</p> <ul style="list-style-type: none"> • RSA within built-up areas must not cause traffic disruption. 	<p>of the motorway.</p> <ul style="list-style-type: none"> • Federal road (not motorway), outside urban area: may not be placed within 20m from the road. 			outside built-up areas	distract or annoy road users, thereby endangering or impeding traffic. • RSA within built-up areas must not cause traffic disruption.
	Guidelines: ANAS	<ul style="list-style-type: none"> • Indications on placement of advertising in relation to road elements not provided for by the regulations, e.g. driveways. 					ANAS gives additional indications on how to authorise advertising located in a built-up area but visible from a suburban road
Italy	Legislation	<p>Highway Code:</p> <ul style="list-style-type: none"> • RSA must not constitute an obstacle or impediment to the movement of disabled persons. • The legislation absolutely prohibits any advertising visible from motorways or main roads • RSA forbidden on traffic islands of intersections <p>Implementation regulation: Min. distances:</p> <ul style="list-style-type: none"> • Outside built-up area and where speed limit is more than 50km/h RSA can be placed at: 100m from other billboards and advertising media; 250m before danger/prescription road signs; 150m after danger/prescription road signs; 150m before indicating signs; 100m after indication signals; 100m from the point of tangency of curves; 250m before intersections; 100m after intersections; 200m from tunnel entrances • Other roads outside urban areas: prohibited at specific locations (e.g. intersections) - see overview in (2) Art. 51, c. 3 • In built-up areas and on suburban roads where speed limit is below 50 km/h: RSA can be placed: along urban slip roads and urban streets 50m before danger/prescription road signs, traffic lights and intersections; along local roads min 30m before danger/prescription road signs, traffic lights and intersections; min. 25m from other billboards and advertising media, from indication signs and after danger/prescription road signs, traffic lights and intersections; min. 100m 	<p>Implementation regulation:</p> <ul style="list-style-type: none"> • RSA can be placed at min. 3m from the carriageway limit. If, at the side of the roadway, there are already fixed structures (walls, trees) at a distance of less than 3m from the carriageway, the RSA may be positioned in line with the fixed structure. • Advertising on curb side and road edges is prohibited • Highway Code: The legislation absolutely prohibits any advertising visible from motorways or main roads 	<p>Implementation regulation:</p> <ul style="list-style-type: none"> • The lower border of RSA (except advertising service installations located outside the built-up areas) must be, at any point, at a level of not less than 1,5m from that of the verge measured in the corresponding road section. • The lower edge of posters and banners, if positioned above the carriageway, both on urban roads and on extra-urban roads, must be on every point, at a height of not less than 5,1m from the road surface. 	<ul style="list-style-type: none"> • Implementation regulation: Distances (see "longitudinal placement") apply if the RSA is perpendicular or inclined with respect to the road axis; they do not apply if the medium is parallel with respect to the road axis. 	<p>(see "longitudinal placement"): Distinction outside/inside built-up area.</p> <ul style="list-style-type: none"> • Implementation regulation: If the suburban road has, for non-temporary reasons, a speed limit of up to 50 km/h, the rules on minimum distances change and become similar to those in built-up areas. • Cultural Heritage and Landscape Code: more complex authorisation procedures for advertising along roads in parks, landscape or protected areas, etc. 	<p>GENERAL: Highway Code: RSA may not distract road users.</p> <p>Highway Code: Structural parts should be made of non-perishable and weather-resistant materials</p>

		from tunnel entrances.					
Country	Documents	Placement Criteria					
		Longitudinal placement	Lateral distance	Vertical placement	Orientation viewing angle	Road environment	Other & general road safety statement
Lithuania	Guidelines	<p>Highway Code:</p> <ul style="list-style-type: none"> • RSA must not constitute an obstacle or impediment to the movement of disabled persons. • The legislation absolutely prohibits any advertising visible from motorways or main roads • RSA forbidden on traffic islands of intersections <p>Implementation regulation: Min. distances:</p> <ul style="list-style-type: none"> • Outside built-up area and where speed limit is more than 50km/h RSA can be placed at: 100m from other billboards and advertising media; 250m before danger/prescription road signs; 150m after danger/prescription road signs; 150m before indicating signs; 100m after indication signals; 100m from the point of tangency of curves; 250m before intersections; 100m after intersections; 200m from tunnel entrances • Other roads outside urban areas: prohibited at specific locations (e.g. intersections) - see overview in (2) Art. 51, c. 3 • In built-up areas and on suburban roads where speed limit is below 50 km/h): RSA can be placed: along urban slip roads and urban streets 50m before danger/prescription road signs, traffic lights and intersections; along local roads min 30m before danger/prescription road signs, traffic lights and intersections; min. 25m from other billboards and advertising media, from indication signs and after danger/prescription road signs, traffic lights and intersections; min. 100m from tunnel entrances. 					

	Legislation	<ul style="list-style-type: none"> • Law on Advertising: Outdoor advertising is prohibited ... in and alongside streets if it might obstruct technical traffic regulation means, reduce visibility, blind traffic participants and pose danger to traffic participants. 	Law on the Roads: Road protection area according to the road category: <ul style="list-style-type: none"> • main roads: 70 metres; • national roads: 50 metres; • regional roads: 20 metres; • roads of local significance (categories I-III): 10 metres • roads of local significance (category IVI): 3 metres. 	<ul style="list-style-type: none"> • Law on Advertising: Outdoor advertising shall be prohibited ... above motorways 		(see "longitudinal placement" and "lateral position") <ul style="list-style-type: none"> • Law on Advertising: Outdoor advertising shall be prohibited ... on motorways, above motorways, in traffic lanes and in protection areas 	GENERAL: Law on Advertising: Outdoor advertising is prohibited ... in and alongside streets if it poses danger to traffic participants.
Country	Documents	Placement Criteria					
		Longitudinal placement	Lateral distance	Vertical placement	Orientation viewing angle	Road environment	Other & general road safety statement
Luxemburg	Guidelines						
	Legislation	Law on road permissions: <ul style="list-style-type: none"> • Urban and rural roads: RsA not allowed within 50m from traffic junctions/roundabouts or pedestrian crossings. • Visibility has to be guaranteed at all time • Not allowed on the central island of roundabouts • Direct road permits - for event publicity: placement should not hide the view on road/direction signs 	Law on road permissions: <ul style="list-style-type: none"> • Motorways: not allowed within the fenced area and min. 37m from the road • National road: permission needed for device within 25m from roadside; • Other road: permission needed for device within 10m from roadside • Direct road permits - for event publicity: <ul style="list-style-type: none"> • Outside urban area: panels 1,50m from the road surface • Inside urban area: panels can be on the ground (max 0,8m height and min. 1m free passage pedestrians) or mounted (min. 2,5m free space under panel) 	Law on road permissions: <ul style="list-style-type: none"> • Over the road min. 6m from street level. • On sidewalks, very specific rules exist and depend on the dimensions of the advert and the placement of it. • Direct road permits - for event publicity: Inside urban area: panels can be mounted (min. 2,5m free space under panel) 		(see "longitudinal placement" and "lateral distance")	Law on road permissions: It is forbidden to fix the panels on trees along roads and on road equipment

Other European countries (not validated)							
Country	Documents	Placement Criteria					
		Longitudinal placement	Lateral distance	Vertical placement	Orientation viewing angle	Road environment	Other & general road safety statement
Estonia	Guidelines						LED screens: ETS-EN 12464-2: 2007 environmental standard E3.
	Legislation	Roads Act: <ul style="list-style-type: none"> May not mislead road users or obstruct their view of a traffic control device; May not make it difficult to distinguish a traffic control device; May not restrict visibility at a junction. 	Roads Act: Not allowed at less than 12m from the edge of the carriageway <ul style="list-style-type: none"> Building Code: protection zone from the outer edge of the outermost lane on both sides of the road by road type: (no RSA) <ul style="list-style-type: none"> European road network: up to 50m Other roads: up to 30m Street: up to 10m (extensions possible) 		Roads Act: "A non-traffic means of information may be installed on a road of the European road network and in the protection zone of such roads only if the means of information is parallel to the axis of the road."	(see "longitudinal placement" and "lateral distance")	Roads Act: May not distract road users
Finland	Guidelines (Finnish Transport Agency)	RSA may not be placed: <ul style="list-style-type: none"> 200m ahead or after a bridge or tunnel Where it covers road signs, traffic signals or markings On junctions/connections, including the access lanes to highways Where special attention is required (e.g. crossing point for pedestrian/cyclists, hilly or curved road sections,....) Minimum distances: <ul style="list-style-type: none"> Motorway/highway/E-Roads: 1500m from an exit or junction and 200m from a traffic control device and other ad Power and access road: 500m from a junction/exit and 100m from a traffic control device or other ad Other roads: 300m from a junction/exit and 100m from a traffic control device or other ad. 	<ul style="list-style-type: none"> Must be placed at least at 10m from the edge of the road area 			(see "longitudinal placement") <ul style="list-style-type: none"> self-illuminating adverts may not be placed along roads without illumination. 	EN 12464-2 (environmental standards for LED signs)
	Legislation						
Hungary	Guidelines						
	Legislation	Road transport Act: <ul style="list-style-type: none"> No RSA in a populated area: <ul style="list-style-type: none"> - in the road area with the exception of the paved area outside the road 	Road transport Act: <ul style="list-style-type: none"> No RSA in a populated area: <ul style="list-style-type: none"> - in the road area with the exception of the paved area outside the road RSA may be placed on the public 	Road transport Act: <ul style="list-style-type: none"> No RSA in a populated area: <ul style="list-style-type: none"> - above the road to be used for the carriage of vehicles, 		(see "longitudinal" placement and "lateral distance")	

			infrastructure (lighting, telephone...)	with its artefacts, accessories, sidewalks, footpaths and cycling paths.			
Iceland	Guidelines						
	Legislation	<ul style="list-style-type: none"> Roads Act: Not allowed 40m from intersections (road owner can decide this to go up to 150m) 	<ul style="list-style-type: none"> Roads Act: May not be placed closer than 30m to the centreline of main roads, and 15m to the centreline of other roads, unless permitted by the road owner. 			(see "longitudinal placement") <ul style="list-style-type: none"> Law of the Conservation of the Nature: Not allowed adjacent to roads or elsewhere in rural areas 	
Malta	Guidelines LN 36/2018 / TM	No RSA at any location where, by reason of ... position, it interferes with or obstructs the view of pedestrians and vehicular traffic Billboards: <ul style="list-style-type: none"> Should not be placed: <ul style="list-style-type: none"> within 50m of approaching junctions or pedestrian crossings so as not to pose any hazard; not on any part of the carriageway; Longitudinal distance of 50m between successive billboards in the same direction; Electronic billboards: <ul style="list-style-type: none"> Only one (1) electronic screen is to be allowed at a single location Not placed within 150m of junctions or pedestrian crossings so as not to pose any hazards; Clear distance of 150m between successive billboards; Only one electronic screen allowed at a single location; Clear distance of 75m between electronic billboards/signs and other non-electronic billboards Both: should not impair the sightlines of any sign (direction, warning) or traffic lights 	No RSA at any location where, by reason of ... position, it interferes with or obstructs the view of pedestrians and vehicular traffic Billboards: <ul style="list-style-type: none"> Should be placed on the nearside of the road and only placed on the far side in a one-way street or dual carriageway with a centre strip; Minimum clear width of 1,2m is to be allowed on the footpath for the free passage of pedestrians; Width and height clearance of tunnels and bridges not to be compromised; Electronic billboards: <ul style="list-style-type: none"> Should be placed on the nearside of the road and only placed on the offside where it is a one-way street or dual carriageway with a centre strip, wide enough to include a billboard. Width and height clearance of tunnels and bridges is not to be compromised; Both: <ul style="list-style-type: none"> Not on any part of the carriageway (also for electronic billboards) 	Billboards: <ul style="list-style-type: none"> Min. clear distance of 0,5m between the overhang and outer kerb or carriageway increased to 1,2m on high speed roads (80km/h); Both: <ul style="list-style-type: none"> Min. clear height of 2,1m if no cyclist paths and 0,9-1,5m if there is no footway and no pedestrian movement or cyclists 		(see "longitudinal" placement and "lateral distance") No RSA on traffic islands and central strips.	<ul style="list-style-type: none"> Application of any billboard should be accompanied with an architect's report ensuring stability within all weather conditions, as well as an insurance policy covering third party rights; Support must be stable in all weather conditions
	Legislation						
Norway	Guidelines: NPRA	<ul style="list-style-type: none"> The entire RSA must be visible RSA should not be placed at certain locations: <ul style="list-style-type: none"> - in conjunction with roundabouts, light-controlled crossings or walking areas; 			<ul style="list-style-type: none"> Text and/or image surfaces on the advertisement should not be placed at a tip angle less 	(see "longitudinal placement": locations) <ul style="list-style-type: none"> RSA should not be placed at accident points; 	Advertisement must be securely affixed and anchored

		<ul style="list-style-type: none"> - where the road leads to heavy breaking (hillside) or is sharply curved; - just before or just after tunnel openings; - in places where other special gaze or sights are likely to attract the attention; • The advertising density should be limited. 			<ul style="list-style-type: none"> • than 60 degrees (60° to 90°) • Position within an angle of 20° to each side for a straight line forward on the road can be accepted. 	<ul style="list-style-type: none"> • Assessment of the guidelines depends on factors such as speed limits, traffic patterns, traffic density and accident history at the site 	
	Legislation	<ul style="list-style-type: none"> • Roads Act: RsA may not be hazardous to traffic: ... block visibility 				(see "longitudinal placement")	GENERAL: Roads Act: RsA may not be hazardous to traffic: ... distract road users

Table C2: Overview of safety related design criteria for RsA in Europe

Country	Documents (criteria)	Design Criteria									
		Movement	Flashing lights	Exposure & transition time	Message sequencing	Quantity of information	Information presentation	Colour	Content	Luminance	Dimensions
PEB countries											
Flanders	Guidelines: AWW	<ul style="list-style-type: none">• Moving images/text are not allowed• No special effects for the transition between 2 adverts, only black screen allowed.	<ul style="list-style-type: none">• Blinking or flashing lights/images are not allowed	<ul style="list-style-type: none">• Display time is min. 30 sec for a digital billboard.• Transition time: immediately, if not: max. 2 sec for a digital billboard (black screen between)	<ul style="list-style-type: none">• Message sequencing with digital billboard is not allowed	<ul style="list-style-type: none">• Quantity of information has to be reasonable, the message has to be quickly understood.	<ul style="list-style-type: none">• Only one screen allowed, this screen cannot be artificially divided in different screens.(*) Digital billboards may not mislead the road user or be a source of confusion - cannot be confused with official road signs	<ul style="list-style-type: none">(*) Digital billboards may not mislead the road user or be a source of confusion - cannot be confused with official road signs	<ul style="list-style-type: none">(*) Digital billboards may not mislead the road user or be a source of confusion; cannot be confused with official road signs<ul style="list-style-type: none">• Messages in contradiction with the public order or that can be experienced as offensive are forbidden.• No real-time interaction with the road user.	<ul style="list-style-type: none">• The luminance level of the digital billboard may not exceed the environment's luminance level. The brightness of the screen has to be automatically adapted in function of the ambient light.• Digital billboard has to be switched off between 10 p.m. and 6 a.m.	<ul style="list-style-type: none">• Max 5m² for a digital billboard(*) Digital billboards may not mislead the road user or be a source of confusion - cannot be confused with official road signs
	Legislation						<ul style="list-style-type: none">• Highway Code: Advertising may not be confused with official road signs.	<ul style="list-style-type: none">Highway Code:<ul style="list-style-type: none">• Advertising may not be confused with official road signs.• Green or red coloured adverts, placed less than 7m	<ul style="list-style-type: none">• Highway Code: Advertising may not be confused with official road signs.	<ul style="list-style-type: none">• VLAREM: Light advertising may not exceed the normal intensity of public lighting intensity.• Highway Code: Advertising device may not dazzle the road user.	<ul style="list-style-type: none">• Highway Code: Advertising may not be confused with official road signs.

								height, are forbidden within 75m from traffic lights.			
Ireland	Guidelines: Guidelines for Planning Authorities										
	Legislation										
Netherlands	Guidelines	RWS (motorways): • No moving images on digital billboards along motorways. CROW (all types of roads): • No special effect for transition between adverts. • No moving images except if it's proven to have no effect on road safety. Never on motorways and express roads.	• RWS: No flashing lights on digital billboards along motorways.	RWS (motorways): • Exposure time min 6 seconds. CROW (all type of roads): • Exposure time min. 6 seconds & preferably 10 seconds (for every type of roads). • Minimum 10 sec. exposure time if several billboards with moving images in eyesight • Transition time = max. 0,1 sec. without special effects	• RWS: Not allowed • CROW: not allowed	• RWS & CROW: Message must be quickly understood and may not surprise the road user	• RWS & CROW: Message must be quickly understood and may not surprise the road user	• RWS & CROW: Billboards may not look like road signs in terms of colours.	RWS (motorways): • Message may not be experienced as offensive (no violence, no nudity, no racism,) CROW (all types of roads): • NRC criteria • May not engender high mental load (no strong or negative emotions, no inciting to an action that distract the driver from his driving task, no new-items, no complex content	NSVV : • Depends on size of billboard and location of road. Roads in nature reserves, rural roads, urban roads, roads in city centre and industrial zones (rural: max 500cd/ m ² ; urban: max 750 cd/ m ² ; town centre: max 1000 cd/ m ²)	RWS & CROW: • Billboards may not look like road signs in terms of shape. • No limitations of size.
	Legislation								NRC: Rules for all types of advertisement: • No hurting content • No threat to mental and/or physical health • May not lead to anxiety or superstitiousness • May not contravene the public interest, public order or morality		

Country	Documents (criteria)	Design Criteria									
		Movement	Flashing lights	Exposure & transition time	Message sequencing	Quantity of information	Information presentation	Colour	Content	Luminance	Dimensions
Northern-Ireland	Guidelines										
	Legislation	<ul style="list-style-type: none"> • PPS 17: Moving or apparently moving elements in display must be avoided, especially when the whole message is not displayed at one time and therefore increasing the time taken to read the whole message. 					<ul style="list-style-type: none"> • PPS 17: May not be confused with traffic lights or any other traffic signs. 	<ul style="list-style-type: none"> • PPS 17: May not be confused with traffic lights or any other traffic signs. 	<ul style="list-style-type: none"> • PPS 17: May not be confused with traffic lights or any other traffic signs. 	<ul style="list-style-type: none"> • PPS 17: Illuminated signs may not, because of their size or brightness, glare, dazzle or distract road users especially in wet or misty weather. • May not reduce the clarity or effectiveness of a traffic sign or signal. 	PPS 17: <ul style="list-style-type: none"> • May not distract the road user because of its unusual design. • May not, because of their size, dazzle or distract road users especially in wet or misty weather.
Slovenia	Guidelines										
	Legislation									<ul style="list-style-type: none"> • Roads Act: Devices may be removed if they... blind people in traffic 	
Country	Documents (criteria)	Design Criteria									
		Movement	Flashing lights	Exposure & transition time	Message sequencing	Quantity of information	Information presentation	Colour	Content	Luminance	Dimensions
Sweden	Guidelines: STA	<ul style="list-style-type: none"> • No dynamic ads 		<ul style="list-style-type: none"> • Time during which every picture is visible should be longer than the time it takes for the road user to pass at the specific speed limit, the section from which the sign is visible (display time in function of speed limit and road environment) 	<ul style="list-style-type: none"> • Sequencing not possible 	Message must be quickly understood: <ul style="list-style-type: none"> • Short • Simple • clear Text as short as possible	Message must be quickly understood: <ul style="list-style-type: none"> • Short • Simple • clear 		<ul style="list-style-type: none"> • No phone number • No web addresses 		

	Legislation						• VMF: Devices that can be confused with or have the same meaning as a device occurring in the Road Marking Ordinance must not be set up adjacent to the road.	• VMF: Devices that can be confused with or have the same meaning as a device occurring in the Road Marking Ordinance must not be set up adjacent to the road.	• VMF: Devices that can be confused with or have the same meaning as a device occurring in the Road Marking Ordinance must not be set up adjacent to the road.		• VMF: Devices that can be confused with or have the same meaning as a device occurring in the Road Marking Ordinance must not be set up adjacent to the road.
Other European countries (validated)											
Austria	Guidelines: to be purchased: http://www.fsv.at										
	Legislation										
	Guidelines										
Cyprus	Legislation: Road Safety Law for the Road Network									<ul style="list-style-type: none"> • <u>Motorway/fast road:</u> May be illuminated by artificial lightning: directly or by reflection • <u>Within urban area</u> May never exceed 24m² May not exceed 12m² if placed <15m from the edge of the road Height and width may never exceed 8m Height and width may not exceed 6m if placed <15m from the edge of the road 	
Country	Documents (criteria)	Design Criteria									
		Movement	Flashing lights	Exposure & transition time	Message sequencing	Quantity of information	Information presentation	Colour	Content	Luminance	Dimensions
Germany	Guidelines										
	Legislation										
Italy	Guidelines: ANAS										

	Legislation	<ul style="list-style-type: none"> Highway Code: Advertising may never involve visual disturbances The use of special effects would violate this rule. 	<ul style="list-style-type: none"> Implementation Regulation: Intermittent lights are expressly forbidden by the regulations 	<ul style="list-style-type: none"> Implementation Regulation: Outside built-up areas it is forbidden to place advertising devices with variable message, having a period of variability of less than 5 minutes, in a position transverse to the direction of travel of the vehicles. Within the built-up areas the permissible period of variability is established by municipal regulations 			<ul style="list-style-type: none"> Highway Code: Advertising signs may not lead to confusion with road signs or reduce their understanding, visibility or effectiveness. 	<ul style="list-style-type: none"> Highway Code: Advertising signs may not lead to confusion with road signs or reduce their understanding, visibility or effectiveness; Implementation regulation: Caution is necessary with the use of colours, especially red, and their combination, in order not to generate confusion with road signs, especially in correspondence and near intersections 	<ul style="list-style-type: none"> Highway Code: Advertising signs may not lead to confusion with road signs or reduce their understanding, visibility or effectiveness. Advertising content, meaning or purpose contrary to the rules of conduct set forth in this code is also prohibited it must not lead to confusion with road signs or make them difficult to perceive or distract road users' attention. 	<ul style="list-style-type: none"> Highway Code: Advertising may never involve visual disturbances or glare. Reflective advertising media are prohibited, as well as light sources and advertisements that can produce glare. Implementation regulation: Light advertisement cannot have intensity of more than 150 candles per m² (no glare) 	<ul style="list-style-type: none"> Implementation regulation: •RsA must have a regular shape and in any case not be confused with road signs. Size outside built-up areas must not exceed 6m² Operating signs placed parallel to the direction of travel of the vehicles or in adherence to buildings may reach a surface of 20m² In urban area the size limitations are established by the municipality
	Guidelines										
Lithuania	Legislation						<ul style="list-style-type: none"> Law on Advertising: Prohibited to use advertising that imitates road signs and/or uses road sign symbols. 	<ul style="list-style-type: none"> Law on Advertising: Prohibited to use advertising that imitates road signs and/or uses road sign symbols. 	<ul style="list-style-type: none"> Law on Advertising: Prohibited to use advertising that imitates road signs and/or uses road sign symbols. Republic of Lithuania Law on Advertising: https://e-seimas.lrs.lt/portal/legAct/lt/TAD/dd69e1e2a58711e59010bea026bdb259?fwid=q86m1vre1 (not specific to RsA) 		<ul style="list-style-type: none"> Law on Advertising: Prohibited to use advertising that imitates road signs and/or uses road sign symbols.
	Guidelines										
Luxembourg	Legislation	<ul style="list-style-type: none"> Law on road permissions: No video allowed, transition possible (depends on speed of the transition) 	<ul style="list-style-type: none"> Law on road permissions: Not allowed 	<ul style="list-style-type: none"> Law on road permissions: Min. 6 sec 			<ul style="list-style-type: none"> Road Code: May not (due to its shape, colour or design) be confused with a traffic/road sign. Direct road permits - for event publicity: 	<ul style="list-style-type: none"> Road Code: May not (due to its shape, colour or design) be confused with a traffic/road signs. 	<ul style="list-style-type: none"> Road Code: May not (due to its shape, colour or design) be confused with a traffic/road signs. Direct road permits - for event publicity: messages must be clear, precise and 	<ul style="list-style-type: none"> Retro-reflectivity not allowed (luminance is not yet defined) 	<ul style="list-style-type: none"> Road Code: May not (due to its shape, colour or design) be confused with a traffic/road signs.

							size and type of letters must be readable (no handwritten inscriptions) at the given speed limit: min. heights: 50 km / h: 90 mm 70 km / h: 130 mm 90 km / h: 180 mm		directly understandable		
Other European countries (not validated)											
Country	Documents (criteria)	Design Criteria									
		Movement	Flashing lights	Exposure & transition time	Message sequencing	Quantity of information	Information presentation	Colour	Content	Luminance	Dimensions
Estonia	Guidelines	• Tallinn city criteria: Moving images and videos are not allowed. Smooth and slow movement of individual elements is allowed.	• Tallinn city criteria: Flashing lights not allowed	• Tallinn city criteria: display time = min. 10 sec						Retro-reflectivity is not allowed. • Tallinn city criteria: LED screens shall comply with the requirements of the ETS-EN 12464-2: 2007 environmental standard E3. In the dark, the light intensity must be brought to a reasonable minimum.	
	Legislation		• Roads Act: May not dazzle road users				• Roads Act: May not (due to its shape, colour or design) be confused with a traffic control device.	• Roads Act: May not (due to its shape, colour or design) be confused with a traffic control device.	• Roads Act: May not (due to its shape, colour or design) be confused with a traffic control device.	• Roads Act: May not dazzle road users	• Roads Act: May not (due to its shape, colour or design) be confused with a traffic control device.
Finland	Guidelines (Finnish Transport Agency)	• No moving images allowed • Transition between 2 ads may not occur by flashing directly to the next ad. • Transition must be progressive: the ad must shut	• No flashing lights allowed	• Transition time must be approximately 2 sec. • Exposure time of an ad = at least 30 sec. • Transition must be progressive: the ad must shut				May not contain the same colours as road signs.	May not contain signs or symbols used for traffic signs	• No glare causing elements or reflective materials allowed • self-illuminating adverts may not be placed along roads without illumination. Illuminated RSA • Should be evenly illuminated	Max. size = 50m²

		down slowly by sliding. Alternatively, the transition between the previous and the next ad can be done overlapping from top to bottom or from left to right for about 2 seconds.		down slowly by sliding. <ul style="list-style-type: none">• Transition between 2 ads may not occur by flashing directly to the next ad						<ul style="list-style-type: none">• Light may not be extinguished and ignited periodically• Luminance of the RsA surface should be less than the reflectivity of road signs• Light must be timed to be illuminated and turned off at the same rate as the road lightningSelf-illuminated RsA• Must not be extinguished and ignited periodically.• The luminous intensity must be such that the ambient light thresholds for the road and rail lighting planning (16/2015) are not exceeded. The limit values are in accordance with the standard SFS EN 12464-2.• At dark time, the average luminance must not exceed 300 Cd/m².• During the twilight period, the luminance must not exceed 5 times the ambient luminance.• Must automatically adjust its brightness according to ambient light• Timed to shut down at the same moment when the road operator possibly shuts down the road lighting at night.	
Legislation											

Country	Documents (criteria)	Design Criteria									
		Movement	Flashing lights	Exposure & transition time	Message sequencing	Quantity of information	Information presentation	Colour	Content	Luminance	Dimensions
Hungary	Guidelines										
	Legislation	<ul style="list-style-type: none"> Government Decree 224/2011: No moving figures 	Government Decree 224/2011: <ul style="list-style-type: none"> No flashing lights allowed. May not contain lights that can be confused with road safety displays. 				<ul style="list-style-type: none"> Government Decree 224/2011: May not contain, resemble or be confused with road signs. 	<ul style="list-style-type: none"> Government Decree 224/2011: May not contain colours that are similar to road signs. 	<ul style="list-style-type: none"> Government Decree 224/2011 : May not contain elements that can be confused with road signs 	Government Decree 224/2011: <ul style="list-style-type: none"> No glare-causing lights May not be illuminated with flashing/dazzling external light. Use of retroreflecting material is not allowed. 	<ul style="list-style-type: none"> Government Decree 224/2011: May not be confused with road signs by its shape.
Country	Documents (criteria)	Design Criteria									
		Movement	Flashing lights	Exposure & transition time	Message sequencing	Quantity of information	Information presentation	Colour	Content	Luminance	Dimensions
Iceland	Guidelines										
	Legislation										

Malta	Guidelines LN 36/2018 / TM	<ul style="list-style-type: none"> No movement such as animation, flashing, scrolling, intermittent or motion videos Electronic screens shall have default design to freeze the display if a malfunction occurs 	<ul style="list-style-type: none"> No movement such as animation, flashing, scrolling, intermittent or motion videos 	<ul style="list-style-type: none"> Recommended display time at least 8 sec (formula: Minimum Display Time (s) = Sight Distance to Electronic Billboard (m) / Speed Limit (m/s)); Transition time between messages is not to be more than 1 sec. (instantaneous change) For electronic signs the complete screen display should change instantaneously 	<ul style="list-style-type: none"> No message sequencing on electronic billboards 		<ul style="list-style-type: none"> RSA may not be confused with any authorized traffic sign, signal or device The size of the letters on (electronic) billboards and signs is to be such that it is easily legible and be very concise 	<ul style="list-style-type: none"> No RSA at any location where, by reason of ... colour, it interferes with traffic RSA may not be confused with any authorized traffic sign, signal or device 	<ul style="list-style-type: none"> RSA may not be confused with any authorized traffic sign, signal or device Material displayed on the (electronic) billboard may not be offensive or contrary to public decency or otherwise against the public interest Electronic billboards: may not prejudice third party rights 	<ul style="list-style-type: none"> RSA may not cause glare ; Illumination is permitted only if it does not lead to unsafe driving conditions, or does not have a detrimental effect on the surrounding area and where it is not specifically prohibited Brightness is to be adjusted in response to changes in light levels so that the signs are not unreasonably bright for the safety of the motoring public. The brightness level is not to exceed 300 candela/m² during the day and 100 candela/m² during the night; Electronic billboards or signs or any of their attachments or supports are not to cause glare 	<ul style="list-style-type: none"> No RSA at any location where, by reason of... shape, it interferes with traffic RSA may not be confused with any authorized traffic sign, signal or device Large scale adverts (>18m²) may be possible in certain areas (commercial, business hubs...) The size of any (electronic) billboard shall not be less than 6m² and is not to exceed 3m by 6m, placed transversely except for adverts on bridges and tunnels
	Legislation										
Norway	Guidelines: NPRA				<ul style="list-style-type: none"> Text or content should not draw attention to the next or following commercials 	<ul style="list-style-type: none"> No website or phone numbers above 50km/h roads The RSA is to be seen as a whole so not more than 8 words, symbols, images and numbers combinations. 	<ul style="list-style-type: none"> No confusion with public signs; Fonts should be simple and easy to read; Good contrast between the text and the background 	<ul style="list-style-type: none"> No confusion with public signs; Good contrast between the text and the background No fluorescent - "luminous" colours 	<ul style="list-style-type: none"> Content must not encourage to make abrupt driving stops or directly draw attention away from traffic (stop, brake, arrows...); RSA is to be seen as a whole so not more than 8 words, symbols, images and numbers combinations together; No ambiguous images, optical deception or special optical effects; No difficult words and number combinations; No website or 	<ul style="list-style-type: none"> No fluorescent - "luminous" colours; No reflective materials; Mirrors or entire glass fronts should also be avoided; No illumination when there is no road lighting; No higher light level than the general light level in the surroundings; Do not turn the light on or off while it is dark. 	<ul style="list-style-type: none"> 50-60 km/h: min. visibility distance at least 10x the largest dimension of the RSA; 70-90km/h: at least 15x; RSA should not have such large dimensions that the size itself may be sensational

									phone numbers above 50km/h roads		
									<ul style="list-style-type: none"> No confusion with public signs; No vivid figures or situations that can lead to immediate fear or unusual attention 		
	Legislation			Regulations on the prohibition of variable advertising along public roads: Changeable advertising: Content and message may not vary more than once per 24 hours outside built-up areas; in built-up areas (50 km/h or lower) this is only forbidden at roundabouts and signal-controlled intersections.			Roads Act: RSA may not be confused with road signs/traffic lights/road markings	Roads Act: RSA may not be confused with road signs/traffic lights/road markings	Roads Act: RSA may not be confused with road signs/traffic lights/road markings		Roads Act: RSA may not be confused with road signs/traffic lights/road markings

Table C3: Luminance of billboards in the Netherlands

Surface of billboard	Nature Reserves	Rural Area	Urban area	Town centres/Industrial Areas
< 0,4 m ²	50 cd/m ²	500 cd/m ²	750 cd/m ²	1000 cd/m ²
0,4 - < 2 m ²	30 cd/m ²	300 cd/m ²	500 cd/m ²	750 cd/m ²
2 - < 5 m ²	20 cd/m ²	200 cd/m ²	300 cd/m ²	500 cd/m ²
5 - < 10 m ²	15 cd/m ²	150 cd/m ²	200 cd/m ²	300 cd/m ²
10 - < 20 m ²	0 cd/m ²	100 cd/m ²	150 cd/m ²	200 cd/m ²
20 - < 50 m ²	0 cd/m ²	75 cd/m ²	100 cd/m ²	150 cd/m ²
50 - < 100 m ²	0 cd/m ²	50 cd/m ²	75 cd/m ²	100 cd/m ²
≥ 100 m ²	0 cd/m ²	5 cd/m ²	10 cd/m ²	25 cd/m ²

*cd/m² is 'Candela per square meter'

D. Road safety criteria for RsA in Australia and New Zealand

Table D1: Overview of safety related placement criteria for RsA in Australia and New Zealand

Country	Documents	Placement Criteria					
		Longitudinal placement	Lateral distance	Vertical placement	Orientation viewing angle	Road environment	Other & general road safety statement
		Restriction distances in relation to traffic control devices and driver decision and action points, as well as advertising device density constrains	Covers location relative to the edge of carriageway and off-set back from kerb etc	Maximum and minimum height and overhead placement	Rotation relative to the carriageway geometry and/or passing vehicle	Covers restriction placement relative to the road environment (speed limit, speed environment, roadside environment, etc.)	
Australia	Austroads (2013). Impact of Roadside Advertising on Road Safety (AP-R420-13). Sydney, Retrieved from: http://scenic.org/storage/PDFs/austroads%20research%20report%20on%20impact%20of%20roadside%20advertising%20on%20road%20safety.pdf	All jurisdictions provide qualitative guidelines in relation to this criterion. A number of jurisdictions also specify minimum restriction distances from other features of the road environment, including other advertising devices, official traffic signs or intersections. Minimum restriction distances vary from 50 m to 160 m across jurisdictions, and depending on device type and speed limit or speed environment. Some jurisdictions cite lower values for smaller devices such as local community and business signs. Most jurisdictions also restrict the density of advertising devices by limiting the number of devices permitted at a single location	All jurisdictions make some reference to lateral placement or associated issues within their guidance. Commonly, jurisdictions require that advertising is not erected within the clear zone (unless on bus shelters). Many jurisdictions provide quantitative guidance, with values ranging from a minimum of approx. 1 m from the carriageway edge to up to 15 m, depending on the device type and speed environment. Generally, the lateral clearance requirements are smaller for smaller devices, such as business signs, and greater for large freestanding billboards. Many jurisdictions also emphasise that advertising should not obstruct road users, including pedestrians/cyclists, nor be located in medians or traffic islands	Most jurisdictions make at least some reference to maximum heights and minimum clearances for advertising devices. The values provided for height restrictions vary considerably depending on the type of device. A number of jurisdictions do not provide height restrictions for large free-standing devices, including digital billboards. A number of jurisdictions quote values of 2.1 to 2.5 m for clearance under freestanding structures, with the higher value particularly used when referring to structures over pedestrian footpaths. Signs and banners suspended or attached to infrastructure across carriageways are generally required to have a clearance of between 5 and 6 m	The majority of jurisdictions have some coverage of this criterion within their guidance. Where provided, in general there is consistency across jurisdictions with most requiring that the sign is erected at right angles to the carriageway with a 5° deflection	Most jurisdictions require that advertising devices do not obscure the view of drivers and in some cases also the view of cyclists and pedestrians, to traffic control devices, official traffic signs, intersections or other road users. Three jurisdictions provide more detailed guidance, covering aspects such as sightline assessment procedures and safe stopping sight distances for road hazards	A number of jurisdictions do not permit advertising devices to be attached to posts for official traffic signs or other purposes (e.g. guide signs) Other restrictions on the placement of advertising devices relate to: <ul style="list-style-type: none">land useroad geometryspecific roads Many jurisdictions have introduced restrictions on the erection of advertising devices on higher-speed roads. A few jurisdictions have strict controls on all types of advertisement; for example, Tasmania does not permit advertising devices on state roads with a speed limit above 60 km/h. Jurisdictions also provide specific guidance in relation to other types of advertising device, such as: <ul style="list-style-type: none">portable devicesaerial devicesdouble-sided signs Five jurisdictions have banned the use of variable or changeable devices on roads with a speed limit above 70 or 80 km/h (including motorways/freeways). In some cases, this applies to advertising located either within the boundaries of or

							visible from state-controlled roads..
New Zealand	<p>Austrorads (2013). Impact of Roadside Advertising on Road Safety (AP-R420-13). Sydney, Retrieved from: http://scenic.org/storage/PDFs/austrorads%20research%20report%20on%20impact%20of%20roadside%20advertising%20on%20road%20safety.pdf</p> <p>NTZA (2011). Traffic control devices manual. Part 3 Advertising signs. New Zealand Transport Agency, Wellington, New Zealand.: Retrieved from: https://www.nzta.govt.nz/assets/resources/traffic-control-devices-manual/docs/part-3-advertising-signs.pdf</p>	<p>Advertising signs should not, in the case of a sign inviting motorists to turn, be located so close to the turning point that motorists have insufficient time to read the sign, signal and turn safely. Advertising signs should not be located within 100 m and 200 m in urban and rural areas respectively of:</p> <ul style="list-style-type: none"> • intersections • permanent regulatory or warning signs • curves (with chevron signing) • pedestrian crossings. <p>The effectiveness of roadside advertising and also traffic safety will be compromised if there are too many advertising displays on the roadside. In situations where they are permitted, off-site advertising signs visible from roadways should be erected at the maximum spacings possible to ensure that passing motorists have a chance to assimilate such signs if they so desire. Recommended minimum distances are provided between successive traffic warning signs with different messages - desirable minima are based on recommended distances between signs requiring decisions. Recommended minimum spacing ranges from 50 m on roads with operating speed of 50 km/h to 80 m on roads with an operating speed of 100 km/h. Desirable spacing ranges from 80 m on roads with an operating speed of 50 km/h to 250 m on roads with an operating speed of 100 km/h.</p>	<p>Lateral clearance distances are controlled by a number of different factors:</p> <ul style="list-style-type: none"> • whether the sign is allowed within the road reserve • whether appropriate clear zone requirements are met (refer to Traffic Control Devices Manual Part 1) • whether the sign can be seen within the driver's field of vision. <p>Advertising signs and markings should not be permitted on the vehicle carriageway, on any traffic island or extended kerb line within the vehicle carriageway. Minimum lateral clearance distance between an advertising sign and the edge of the carriageway for roads with a speed limit of 60 km/h or less should be 1.5 m. This minimum distance increases to 3 m for roads with a speed limit greater than 60 km/h. For state highways, the NTZA requires signs to not be located closer than 5 m from the edge of the carriageway. No advertising sign or device, whether temporary or permanent, should be located on or above a footpath or berm closer than 0.5 m to the kerb face or the edge of the vehicle carriageway. Where footpath-mounted advertising is allowed by local authorities the recommended conditions applicable to their use include the sign should not reduce the width of any footpath or other pedestrian way useable by pedestrians to less than 2 m.</p>	<p>In locations where the signs are installed above an area used by pedestrians such as footpaths, the recommended minimum vertical clearance is 2.5 m with an absolute minimum of 2.1 m. Signs or banners over the roadway should have a minimum vertical clearance of 5.5 m (this does not apply to signs mounted on bridges where the absolute minimum clearance is 4.9 m) (NZTA, 2011).</p> <p>In general, visibility problems will not be caused by signs or devices which are (NZTA, 2011):</p> <ul style="list-style-type: none"> • less than 1 m in height, except where they are likely to obscure children • the bottom of the sign is more than 3 m above the level of the roadway. 	<p>The sign must be at right angles to the state highway and positioned to avoid vehicle headlight reflection. The location, orientation and design of advertising signs in relation to the road should be assessed to ensure advertising signs can be read without a motorist having to slow down or stop their vehicle.</p>	<p>Roadside advertising may create restrictions to sight visibility and create a safety hazard if it obstructs or interferes with:</p> <ul style="list-style-type: none"> • road users' view of a road hazard, person or oncoming vehicle on the roadway • road users' view of a person or vehicle about to enter the roadway. <p>The sign must not obscure driver visibility at accesses or intersections. Signs should be placed as close as possible to drivers' lines of sight while maintaining the lateral clearances from the roadway. Minimum sight distances are defined, ranging from 80 m for 50 km/h roads to 250 m for 100 km/h roads. For 70 km/h roads, the recommended minimum distance is 130 m. The distances relate to the absolute and desirable sight distances along the major road from 5 m (3m minimum) back from the major road. Corrections should be made where the gradient is greater than 2%. Billboards must not be placed on or over motorways.</p>	<p>It is recommended that road authorities discourage the use of aerial display devices in all forms.</p> <p>To avoid excessive clutter of roadside advertising signs, it is recommended that territorial authorities and road controlling authorities restrict the erection of off-site advertising. Such an approach is a practical method of controlling the proliferation of roadside advertising. It is noted, however, that provided controls are adequate to ensure orderly and legible displays, there is no reason why an off-site advertising sign should have more of an adverse effect than a similar on-site sign. Indeed, in some situations in rural areas, off-site advertising in advance of or in close proximity to a site may serve its purpose more safely and effectively than on-site advertising. Consenting authorities should provide for such situations in areas with speed limits of 70 km/h or more and/or develop policies in relation to provision of official signing for tourist and service activities.</p>

Table D2: Overview of safety related design criteria for RSA in Australia and New Zealand

Country	Documents (criteria)	Design Criteria									
		Movement	Flashing lights	Exposure & transition time	Message sequencing	Quantity of information	Information presentation	Colour	Content	Luminance	Dimensions
		Covers presence of motion in the advertisement (video, special effects, transition, movement or rotation between successive displays)	Use of flashing, blinking, revolving, pulsating or intermittent lights	Message display duration, exposure time,...	Use of a sequence of displays/messages as part of a single advertisement	Message length, quantity of text, number of elements	Layout, font, size, spacing, etc.	Covers use of colour in general or relative to a specific area of the sign	Content, meaning of the ad including graphical and textual elements	Use of luminance or retro-reflectivity	Size and shape of the advertising device
Australia	Austroroads (2013). Impact of Roadside Advertising on Road Safety (AP-R420-13). Sydney, Retrieved from: http://scenic.org/storage/PDFs/austroroads%20research%20report%20on%20impact%20of%20roadside%20advertising%20on%20road%20safety.pdf	There is considerable variation in the policies of agency towards the approval of advertising devices which contain movement. Some jurisdictions have a complete ban on electronic billboards and VMS that are located within (or visible from) state-controlled roads. Some jurisdictions allow the latter devices but require that there is no animation or dynamic images (i.e. the message remains static until display of the next message). Queensland and Western Australia do not permit VMS or changeable signs within the boundaries of state-controlled	All but 2 jurisdictions will not approve the use of flashing lights on advertising devices on or within visibility of state-controlled roads. In Queensland and Western Australia, flashing lights may be approved provided they meet specific criteria. This may include the colour of the lamps, the rate of flashing, the location of the sign relative to road speed and land use or the type of sign. The proposed acceptable rate of flashing is identical for both jurisdictions – 2 flashes per second in environments with high to moderate off-street ambient lighting levels, and	The dwell time is not always covered in the guidance, presumably because some jurisdictions do not generally approve advertising devices that contain movement or changeable messages. Three jurisdictions indicate required or advisory minimum dwell times, ranging from 2.5 to 30 secs (also depending on sign type). Two other jurisdictions require that the driver does not see more than one message in the period of exposure, under normal driving conditions (Austroroads, 2013). Also the transition	This criterion is not always covered in the guidance, presumably because some jurisdictions do not generally approve advertising devices that contain movement or changeable messages. Where referenced, the general approach is that sequential messaging is not recommended or prohibited. Queensland and Western Australia provide more detailed guidance, with Queensland specifying that a maximum number of 3 sequential messages are permitted on VMS, or 2 in higher trafficked locations	The majority of jurisdictions do not refer to this criterion explicitly. New South Wales provides quantitative restrictions on the number of information elements or words/symbols	Legibility is recognised by over half of the jurisdictions as being significant for road safety. Four jurisdictions provide specific guidance on requirements for the presentation and format of information within the message. This mainly focuses on the minimum letter heights, which ranges from 80 mm to 200 m (also depending on sign type)	The large majority of jurisdictions will not approve advertising devices with a message that is coloured in such a way that they may be confused with an official traffic sign or signal. Queensland also provides guidance on requirements for background colouring of text-only VMS	Nearly all jurisdictions will not allow advertising devices with a message that imitates a traffic control device, traffic sign or any other advisory or regulatory sign permitted by the road authority. For example, many jurisdictions require that the message does not provide instruction to drivers	All jurisdictions refer to luminance/illumination in their guidance. A few jurisdictions have a ban on illuminated messages for specific types of advertising device. Some jurisdictions will not approve non-static illuminated devices within the boundaries of state roads. Four jurisdictions have provided quantitative guidance on permitted maximum luminance levels for zones with different ambient light conditions; the most stringent of these are in Queensland and Western Australia, where the maximum permitted luminance ranges	Many jurisdictions require that advertising areas and device dimensions are aligned with industry standards. It is also required that devices do not imitate the shape of a traffic control device or sign. The majority of jurisdictions provide specific guidance on acceptable dimensions and areas across different types of advertising device

Country	Documents (criteria)	Design Criteria									
		Movement	Flashing lights	Exposure & transition time	Message sequencing	Quantity of information	Information presentation	Colour	Content	Luminance	Dimensions
		roads, and only allow them to be visible from such roads where the speed limit is below 80 or 70 km/h respectively. These states do permit rotating devices within the boundaries of state-controlled roads provided they meet certain criteria	zero flashes per second for environments with low off-street ambient lighting levels	time is not always covered in the guidance, probably also because some jurisdictions do not generally approve advertising devices that contain movement or changeable messages. Four jurisdictions provided quantitative guidance on maximum transition times. Required times range from 0.1 to 4 seconds. Times are sometimes dependent on whether the device has an electronic display or is mechanically changed. Queensland advises that for electronic devices, the screen should change instantaneously						from 300 to 500 cd/m ² depending on the surrounding land use. Some jurisdictions also provide additional guidance on other relevant aspects such as veiling luminance and glare	

New Zealand	<p>Austrroads (2013). Impact of Roadside Advertising on Road Safety (AP-R420-13). Sydney, Retrieved from: http://scenic.org/storage/PDFs/austrroads%20research%20report%20on%20impact%20of%20roadside%20advertising%20on%20road%20safety.pdf</p> <p>NZTA (2011). Traffic control devices manual. Part 3 Advertising signs. New Zealand Transport Agency, Wellington, New Zealand.: Retrieved from: https://www.nzta.govt.nz/assets/resources/traffic-control-devices-manual/docs/part-3-advertising-signs.pdf</p>	<p>Animated or flashing signs should not be used as roadside advertising if they (NTZA, 2011):</p> <ul style="list-style-type: none"> • incorporate a revolving light of any colour • rotate as a whole about any axis other than a vertical one. <p>Advertising signs which move or give the appearance of motion (e.g. by use of sequentially flashing lights) or that include lights or light sources which flash, revolve, move or vary in intensity are unlikely to be considered acceptable (NTZA, 2011)</p>	<p>Animated or flashing signs should not be used as roadside advertising if they incorporate a revolving light of any colour (NTZA, 2011).</p> <p>Animated or flashing signs should not be used for roadside advertising if the operating speed of passing traffic is 70 km/h or greater (NTZA, 2011).</p> <p>Flashing lights cannot be used on vehicles to promote vehicle-mounted advertising as stated in clause 8.5 of the Road User Rule 2004 (NTZA, 2011).</p>			<p>Animated or flashing signs should not be used as roadside advertising if the message is more complex than a single word, logo or symbol displayed in any direction at one time (NTZA, 2011).</p>	<p>The size of the lettering for any words on an advertising sign should be increased as the speed of passing traffic increases (NTZA, 2011). Minimum recommended letter sizes varying according to the posted speed limit are provided. Guidance is also provided on the use of fonts i.e. Helvetica and Transport Medium considered good examples. NTZA (2011) also discusses letter hierarchy, sign background and message contrast. The message on a sign should take up no more than 40% of the total sign area in commercial or industrial areas where there other competing signs, and 60% in rural / residential areas with few other signs.</p>	<p>An advertising sign or device should not be displayed or constructed where visible from a roadway if it (NTZA, 2011):</p> <ul style="list-style-type: none"> • is coloured red, green, orange, white or yellow in combinations of colours and/or shapes which may be mistaken for a traffic control device • has red, green, orange, white or yellow in isolation or in combinations of colours and in a location where it is likely to form the foreground or background to or appear alongside a traffic control device of similar colour when viewed by approaching motorists • contains large areas of red, green or orange display on illuminated signs which at night are likely to cause confusion with traffic control signals or stop or tail lights of vehicles. 	<p>Advertising signs should not (NTZA, 2011):</p> <ul style="list-style-type: none"> • imitate traffic signs • give instructions to motorists that conflict with any traffic sign or traffic control device • compete with existing direction signs • in the case of a sign inviting motorists to turn, be located so close to the turning point that motorists have insufficient time to read the sign, signal and turn safely. 	<p>Any advertising signs or devices which are internally or externally illuminated should (NTZA, 2011):</p> <ul style="list-style-type: none"> • comply with the maximum luminance as provided in detail • have all floodlights or concealed lighting directed solely on to the advertisement and its surrounds • have any light source shielded so that glare does not extend beyond the advertisement • with the exception of neon signs, have no light source visible to passing motorists with a light output greater than that of a 65W incandescent bulb. 	
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E. Future trends: semi-structured interview

Outdoor advertising has been through a lot of evolution since the beginning of the 20th century.

Can you summarize us the major changes that the outdoor advertising sector has faced ?

- ⇒ Changes in legislations/regulations?
- ⇒ Changes in marketing techniques, and content of the ad
- ⇒ Evolution of billboards/technology used
- ⇒ Evolution in the relation marketer ↔ advertiser
- ⇒ Evolution in the relation advertiser ↔ road administration

There is no European regulation for the placement of roadside advertising, national or local authorities are free to define their own criteria and procedure for roadside outdoor advertising. A first survey gave us a glimpse of the differences between European countries' regulations and the effective application of these.

In which countries is your company active?

Do you have an overview of the legislations and guidelines for these countries?

- ⇒ What can you say about the effective application of these legislations and guidelines?
- ⇒ Which countries apply the most restrictive regulation towards road side advertising?

According to you, what are the main arguments/motivations behind these restrictions?

- ⇒ Is road safety regularly used as argument/motivation to forbid road side advertising?
- ⇒ According to you, should road safety be an important criterion?
 - Why (not)?

According to different sources, including advertising companies, the use of digital out-of-home (DOOH) advertising is increasing while traditional out-of-home (OOH) remains stable.

Has roadside advertising been growing in the past 10 Years?

- ⇒ To what extent?
- ⇒ Do you expect it to grow further in the next decade?

Can you give us more details about DOOH?

- ⇒ What is included in DOOH?
- ⇒ What is the share of digital roadside billboards ?

Does the growth of DOOH means a growth in digital billboards?

- ⇒ To what extent?
- ⇒ Do you expect to grow further in the next decade?
 - Slower/ Faster?

- ⇒ *Do you think Digital billboards will completely overwhelm classic billboards for road side advertising?*
 - *Why (not)?*
 - *When: Medium term? (<10 Years)/Long terms ?(>10 years)*

New technologies open the door to new advertising techniques. What are the main innovations in terms of roadside advertising that we will see on medium term (<10 years)?

While doing our literature study, we noticed that digital billboards are becoming “smarter”, some of them are now able to collect information and to react with their environment (eg: [Interaction with road user](#) , [Google doubleclick ad](#) , Radar, adapt messages to different users)

Can you tell us more about smart billboards?

- ⇒ *What are the different technologies already used and their application?*
 - *Which are used for roadside advertising?*
 - *Which are used by your company?*
- ⇒ *What will be the future developments for roadside advertising?*
 - *How soon do you expect them to be in use?*
 - *How likely will your company apply each of these techniques?*

What will be the future challenges linked to these new/future outdoor advertising techniques?

- ⇒ *For the industry?*
- ⇒ *For the public authorities?*
- ⇒ *For the road administration?*
- ⇒ *For the safety world?*
 - [Hacking](#): a new problem?
 - Privacy issues?

How can the road safety world anticipate the future challenges?

- ⇒ *New regulations?*

Do you think that the relation between the road administration and the outdoor advertising companies is changing? (eg: Urban facilities being paid by advertising companies)

- ⇒ *How?*