

## ANNEX 2. DRIVERS' EVALUATION SURVEY

Based on the outcomes of Tasks 1.1 and 1.2, a survey was created to evaluate the comprehensibility of existing UVAR signage, and some road signs proposed by the UVAR Exchange project considering the guidelines drafted on its main reports.

The survey was drafted by the consortium members benefiting from the Road Signs Expert at the United Nation's Group of Experts on Road Signs and Signals, Stefan Egger. This was an iterative process conducted in November 2022.

The survey was made available through EUSurvey and kept open from the end of November until the 31<sup>st</sup> of December 2022. The dissemination was made via the project communication channels (social media, website, and CLARS public authority and stakeholder newsletters), the consortium's contacts list, and through several networks such as Polis, ICLEI, the International Road Union (IRU), the German automobile club ACE and the UNECE working group on road signs. The only requirement for taking part in the survey was having a driving license.

The survey was made available in English, Dutch, German, Greek, Slovenian, Italian, French, and Portuguese. Please note that only the text was adapted while the signage was kept in the original language such as presented in the figures below.

A total of 306 respondents answered the survey. An overview of the nationalities and other attributes of respondents is given at the end of this report.

This Annex presents the driver's evaluation survey results and it is organized in x sections.

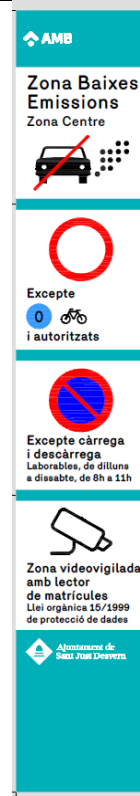
The sections present the questions of survey, their interpretation and the correct answers.

For each signage interpretation question, a percentage of respondents that correctly understood the road sign (number of selected correct answers divided by the total number of correct answers) and incorrect, those who misunderstood the road sign (same calculation but with the incorrect options) answers was calculated and used as a reference. The variables were named %Correct and %Incorrect, respectively.

Section 1 focused on existing UVAR signage interpretation (examples from Barcelona, Lisbon, The Hague, France). Section 2 addressed the UVAR interpretation of Limited Traffic Zone (LTZ), Low Emission Zone (LEZ), Zero Emission Zone (ZEZ) and Pedestrian Zone (PED). Section 3 presented the consortium proposed UVAR signage interpretation (examples for Italy, The Netherlands, Spain, France), and Section 4 provides an overview of the drivers and their background. Comments and suggestions provided by the respondents through an open question are summarized in Section 5, while Section 6 provides a conclusion with an overview of the survey results and recommendations.

## Section 1 – Existing UVAR signage interpretation (Barcelona, Lisbon, The Hague, France)

### 1.1 Barcelona (Spain)



#### Explanation:

The signals are placed at the entry gate of a Limited Traffic and Low/Zero Emission Zone in Sant Just Desvern, a town in the metropolitan area of Barcelona (Spain).

The signal on the left is not in line with the UN Vienna Convention and uses a one sole informative panel with more signs in vertical sequence.

The red roundel (C,2 sign) means “no entry” and prescribes that all vehicular traffic is prohibited in both directions. Those excepted by the rule are:

- owners of a “0” Spanish emission sticker meaning that battery electric vehicles (BEVs), extended range electric vehicles (REEVs), plug-in hybrid electric vehicles (PHEVs) with a range of 40 km or fuel cell vehicles are allowed to enter the zone;
- bicycles;
- authorised vehicles.

The C,18 sign (red roundel and diagonal bar on a blue background) means “no parking” except for loading and unloading operations on working days, Monday to Saturday, 8 to 11 am only.

A CCTV symbol and text indicates that an automatic number plate recognition (ANPR) enforcement system is in place.

The blue metal sign on the left (mounted on the camera pole) indicates the beginning of a residential/pedestrian priority area where:

- Pedestrians may make use of the road over its entire width. Games are allowed.
- Drivers shall proceed at very low speed, as specified by national legislation and which in no case should exceed 20 km (12 miles) per hour.
- Drivers shall not put pedestrians at risks nor behave in an obstructive manner. If necessary, they shall stop.
- Pedestrian shall not impede vehicular traffic unnecessarily.
- Parking is forbidden except where allowed by parking signs;
- At intersection, road users emerging from a residential area shall give way to other road users, except when otherwise provided in domestic legislation.

**Correct answers:**

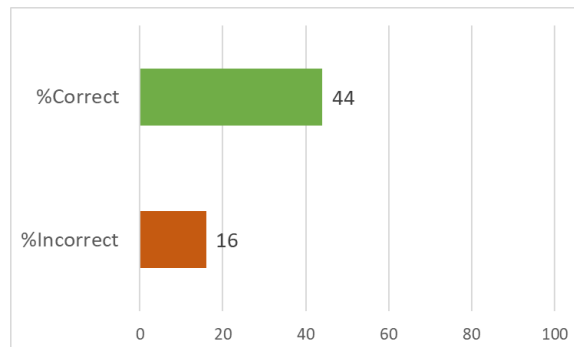
	%Selected correctly	%Selected incorrectly
<input checked="" type="checkbox"/> 1) This is a Limited Traffic Zone (no access unless permitted).	47	
<input checked="" type="checkbox"/> 2) This is a Low Emission Zone (no access for polluting vehicles only).	69	
<input checked="" type="checkbox"/> 3) I need to have a specific sticker or permit to enter the zone.	24	
<input checked="" type="checkbox"/> 4) Zero emission vehicles are allowed to enter the zone any time.	46	
<input type="checkbox"/> 5) Loading and unloading is allowed any time.		20
<input type="checkbox"/> 6) Freight vehicles do not need to ask for a permit.		12
<input checked="" type="checkbox"/> 7) The restriction is operating 24h a day, 7 days a week.	35	

**Results:**

Almost 70% of the respondents correctly recognizes the area as a LEZ and this seems to be facilitated by both the extended text and the polluting car symbol. Almost half of them also correctly selected the LTZ option whereas some discrepancies among the answers exists in terms of sticker/permit need: respondents understand the need of a permit for freight vehicles (and the time limit of freight operations - probably because of the dedicated sign) but not for the other categories. Also time validity of the scheme is not properly recognized.

For question 1.1, the incorrect option selected most often was “Loading and unloading is allowed at any time”. This option was selected by approximately 20% of the respondents.

The correct answer selected less often was “I need to have a specific sticker or permit to enter the zone”, selected by only 24% of the respondents. This could have happened due to the lack of information about permits.



## 1.2 Lisbon (Portugal)



### Explanation:

The zonal sign is placed at the entry gate of a Low Emission Zone in Lisbon (Portugal).

The red roundel (C,2 sign) means “no entry” but the text specifies the prohibition applies to owners of Euro 0 and 1 vehicles (i.e. built before 1996).

The prohibition is in force on working days only, from 7 am to 9 pm.

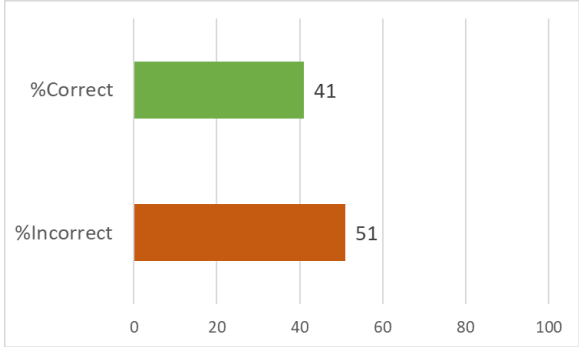
Those excepted by the rule are residents and owners of “historical vehicles”.

### Correct answers:

		%Selected correctly	%Selected incorrectly
<input type="checkbox"/>	1) This is a Limited Traffic Zone (no access unless permitted).		41
<input checked="" type="checkbox"/>	2) This is a Low Emission Zone (no access for polluting vehicles only).	29	
<input checked="" type="checkbox"/>	3) If my car is from 1997, I am allowed to enter the zone.	61	
<input type="checkbox"/>	4) If my car is Euro 1, I am never allowed to enter the zone.		43
<input type="checkbox"/>	5) I need to ask for a permit if I live inside the zone.		22
<input checked="" type="checkbox"/>	6) Bicycles are allowed to enter the zone any time.	44	
<input type="checkbox"/>	7) The restriction is operating all days from 7am to 9pm.		70

**Results:** For question 1.2, the incorrect option selected most often was “The restriction is operating all days from 7am to 9pm.”. This option was selected by approximately 70% of the respondents. This happened probably due to the linguistic barriers where “dias úteis” was not perceived as “working days”. If only Portuguese respondents were considered, the %Correct would increase to 51% and the %Incorrect decrease to 37%. Nevertheless, the rates suggest that the interpretation is still not well understood, even if we remove the challenge of the language.

Also, 41% of the respondents selected “This is a Limited Traffic Zone (no access unless permitted)” and only 29% recognized the scheme as a LEZ: this might be linked to the use of the C,2 “no entry symbol”. 43% selected the option “If my car is Euro 1, I am never allowed to enter the zone” so not recognizing the limited time validity of the scheme.



### 1.3 The Hague (The Netherlands)



#### Explanation:

The zonal sign is placed at the entry gate of a Low Emission Zone in The Hague (The Netherlands).

The red roundel (C,2 sign) means “no entry” and the inscription inside “environmental zone”.

“Toegestaan” means “authorised” and the additional panels indicates that the vehicles excepted by the rule are:

- cars and goods vehicles with two axles Euro 4 or higher emission standard
- buses/coaches and goods vehicles with three axles Euro 6 or higher emission standards

The camera symbol indicates that an automatic number plate recognition (ANPR) enforcement system is in place.

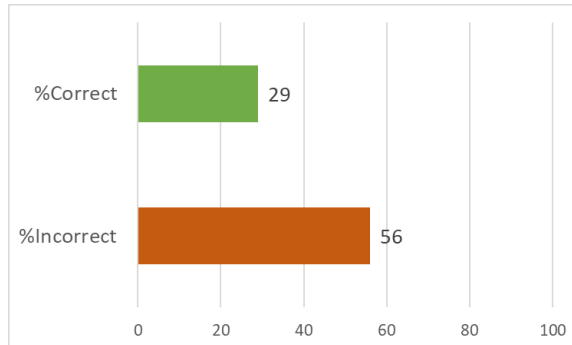
#### Correct answers:

	%Selected correctly	%Selected incorrectly
<input type="checkbox"/> 1) This is a Limited Traffic Zone (no access unless permitted).		33
<input checked="" type="checkbox"/> 2) This is a Low Emission Zone (no access for polluting vehicles only).	39	
<input type="checkbox"/> 3) I need to obtain a specific sticker or permit to enter the zone.		21
<input checked="" type="checkbox"/> 4) If my car is Euro 5, I can enter the zone at any time.	59	
<input type="checkbox"/> 5) If my car is Euro 5, I need to ask for a permit/sticker to enter the zone.		8
<input type="checkbox"/> 6) Trucks labelled with sticker 5 cannot enter the zone.		54
<input checked="" type="checkbox"/> 7) Bus/Coaches Euro 6 can enter the zone.	69	

#### Results:

For question 1.3, the incorrect option selected most often was “Trucks labelled with sticker 5 cannot enter the zone”. This option was selected by approximately 54% of the respondents. This is a case where euro standards and emissions stickers are misinterpreted. The sentence would be correct if it was written “euro 5” instead of “sticker 5” as for option nr. 4 that in fact was correctly selected by almost 60% of the respondents.

Also, 33% of the respondents selected “This is a limited traffic zone”. This happened probably due to the linguistic barriers where “milieu zone” was not perceived as “environmental zone”. Consequently, only 39% perceived the restriction as a low emission zone.



#### 1.4 France



#### Explanation:

The zonal sign is placed at the entry gate of a Low Emission Zone in France.

The red roundel (C,2 sign) means “no entry” and the additional panels indicate that the vehicles excepted by the rule are:

- Owners of a “green”, 1, 2, 3 or 4 Crit’Air emission stickers

The restriction is valid:

- All days from 8am to 8pm for goods vehicles of 3,5 t and higher plus buses/coaches
- Monday to Friday except for festive days from 8am to 8pm for cars and motorcycles

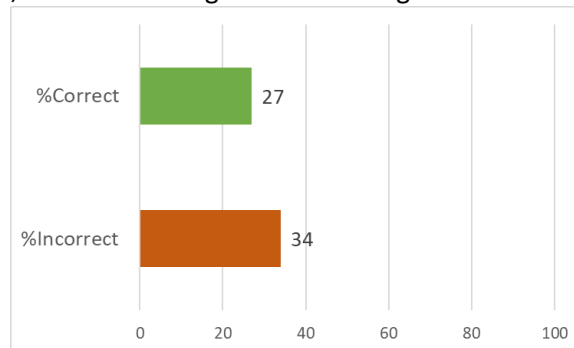
**Correct answers:**

		%Selected correctly	%Selected incorrectly
<input type="checkbox"/>	1) This is a Limited Traffic Zone (no access unless permitted).		55
<input checked="" type="checkbox"/>	2) This is a Low Emission Zone (no access for polluting vehicles only).	30	
<input type="checkbox"/>	3) If my car is Euro 3, I can enter the zone at any time.		16
<input checked="" type="checkbox"/>	4) If my car is labelled with sticker 3, I can enter the zone at any time.	28	
<input type="checkbox"/>	5) If my car is labelled with sticker 5, I can enter the zone on Monday at 7 am.		31
<input checked="" type="checkbox"/>	6) If my car is labelled with sticker 5, I cannot enter the zone at any time.	20	
<input type="checkbox"/>	7) I can always enter the zone on Sundays.		29

**Results:**

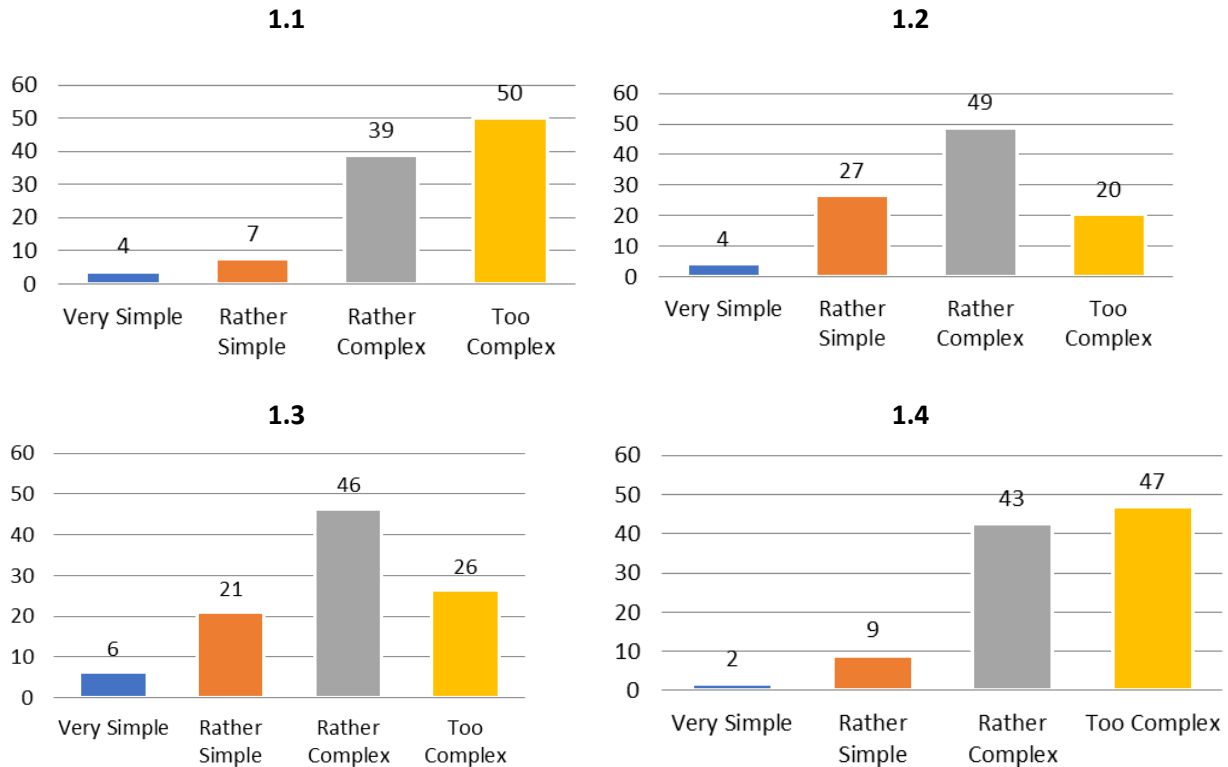
For question 1.4, the incorrect option selected most often was “This is a Limited Traffic Zone (no access unless permitted)”. This option was selected by approximately 55% of the respondents. This might be due to the use of the C,2 sign with no pictograms or text referring to “emissions”, combined with the lack of knowledge about stickers’ systems. 22% of the respondents don’t even know if a stickers system is being applied in their country, and around 39% answered that their country doesn’t use stickers, which can justify the lack of familiarity with stickers for representing polluting levels.

The correct answer selected less often was “If my car is labelled with sticker 5, I cannot enter the zone at any time”, selected by only 20% of the respondents. This could be due to the lack of knowledge of the stickers system or, probably, due to a misunderstanding if the first additional panel is related to the applicability or exemptions, which relates again with the linguistic barriers.





- **Complexity level of each sign (% of respondents)**



- The signs presented in 1.1 and 1.4 are the ones that respondents answered most often as “too complex”. This can be due to the larger amount of information presented. Also, the sign presented in 1.4 refers to emission stickers and most of the respondents probably are not aware of such representation. 22% of the respondents don’t even know if a stickers system is being applied in their country, and around 39% answered that their country doesn’t use stickers. If the positive options (very simple and rather simple) and the negative options (rather complex and too complex) are combined instead of isolating them, the signs presented in 1.1 and 1.4 are still the most complex, with identical percentages of 89% for negative options and 11% placed on the positive side options. By doing the same exercise for the signs presented in 1.2 and 1.3, the results are also quite similar between them, with 31% (1.2) and 27% (1.3) of positive answers and 69% (1.2) and 73% (1.3) of negative answers.
- Overall, answers are generally placed in the “rather complex” and “too complex” options.

## Section 2 - UVAR interpretation

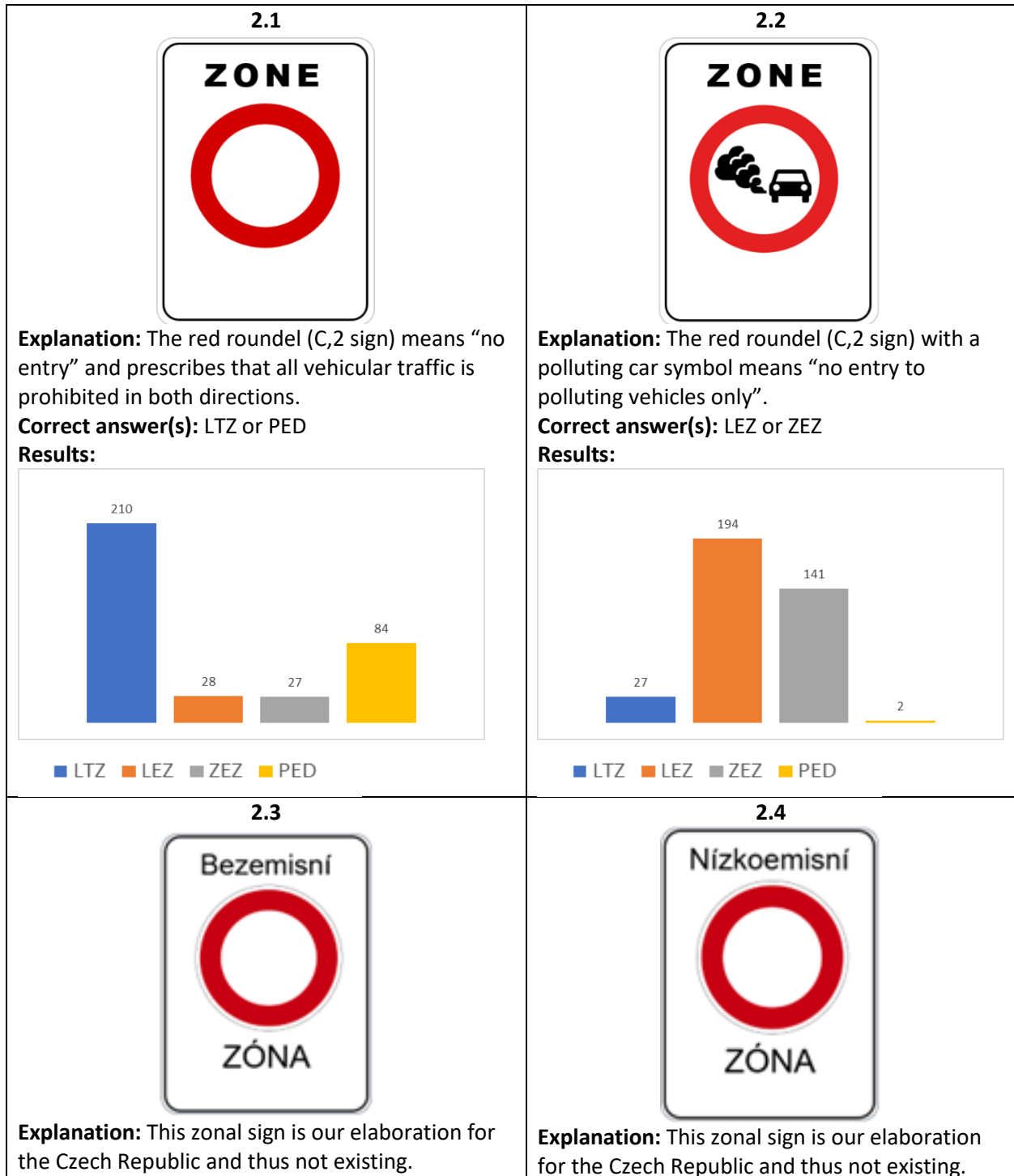
Before asking the questions placed on Section 2 – *UVAR interpretation*, definitions were provided for the following UVAR typologies:

- Limited Traffic Zone (LTZ)
- Low Emission Zone (LEZ)
- Zero Emission Zone (ZEZ)

- Pedestrian Zone (PED)

After providing the definitions, the respondent was asked to associate each one of the following panels with the UVAR typologies they could correspond to.

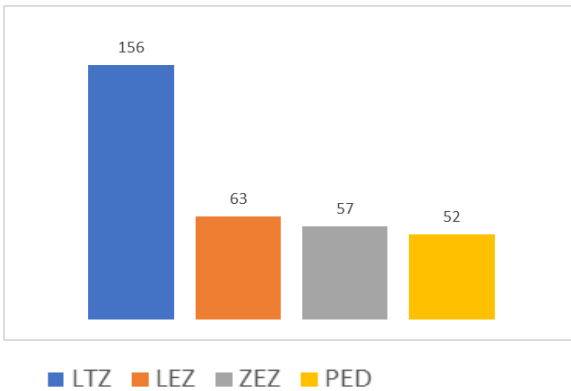
The answers are provided below in the form of bar charts.



“Bezemisní” means “zero emission” in Czech language.

**Correct answer(s):** ZEZ

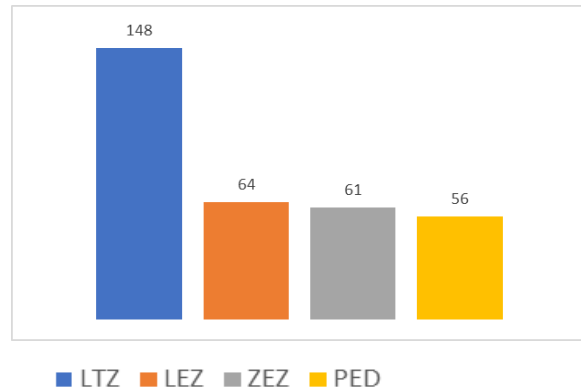
**Results:**



“Nízkoemisní” means “low emission” in Czech language.






**Correct answer(s):** LEZ

**Results:**

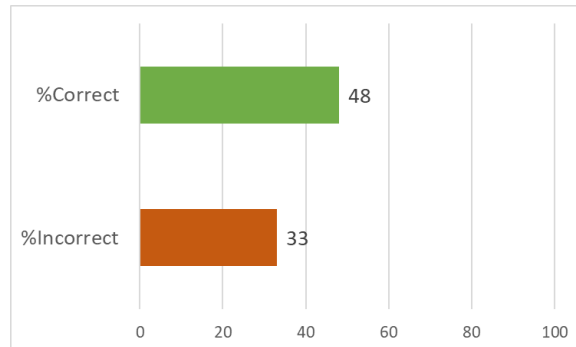


- Overall, the signs presented in 2.1 and 2.2 were correctly interpreted.
- The signs presented in 2.3 and 2.4 induced several times in errors.  
Only 14% answered entirely correctly to question 2.3 and 13% to question 2.4. Most respondents assumed that the signs were applied to Limited Traffic Zones, most probably because they did not understand the language (Czech). Only one person had Czech nationality and, consequently, that person choose the right answers for both signs. Also, there was 2 Polish and 1 Slavic respondents. They all answered correctly, probably due to the similarity between the three languages. Moreover, since there was no symbol inside the red circle, respondents who do not understand the text tended to assume that it is only a traffic limitation and do not relate it to the environment. It is therefore recommended that the polluting vehicle symbol is used inside the red circle for LEZ and ZEZ road signs to increase comprehension.

Section 3 – Proposed UVAR signage interpretation (Italy, The Netherlands, Spain, France)

3.1 Italy		
    	<p><b>Explanation:</b></p> <p>This zonal sign is our elaboration for Italy and thus not existing. It indicates a Low Emission Zone in force on working days only, Monday to Friday, 7am to 7pm</p> <p>Vehicles excepted by the rule are:</p> <ul style="list-style-type: none"> <li>• Diesel cars Euro 6 and higher</li> <li>• Diesel goods vehicles/buses/coaches Euro 5 and higher</li> <li>• Gasoline cars Euro 3 and higher</li> <li>• Gasoline Mopeds/Motorcycles Euro 2 and higher</li> <li>• Authorised vehicles</li> </ul> <p>An automatic number plate recognition (ANPR) enforcement system is in place.</p> <p>Information and permits can be obtained via the indicated website and phone number.</p>	
<b>Correct answers:</b>		
	%Selected correctly	%Selected incorrectly
<input type="checkbox"/>	1) This is a Limited Traffic Zone (no access unless permitted).	20
<input checked="" type="checkbox"/>	2) This is a Low Emission Zone (no access for polluting vehicles only).	79
<input type="checkbox"/>	3) I need to have a specific sticker or permit to enter the zone.	32
<input type="checkbox"/>	4) The restriction is in force every day from 7am to 7pm.	48
<input checked="" type="checkbox"/>	5) Any type of vehicle can enter the zone on Sundays.	58
<input checked="" type="checkbox"/>	6) If my car runs on gasoline and is Euro 3, I can enter the zone at any time.	58
<input type="checkbox"/>	7) If my car is diesel and Euro 5, I can enter the zone at any time.	13
<b>Results:</b>		
The use of the polluting car symbol largely improves the comprehension of the scheme as LEZ and not LTZ: almost 80% correctly selected option 2 and not selected option 1.		

The incorrect option selected most often was “The restriction is in force every day from 7am to 7pm”. This option was selected by approximately 48% of the respondents. This result indicates that the crossed hammer symbol referring to the working days is not well known by most of the respondents. Even when we look to respondents with Italian nationality (where this symbol is often used) or that are used to drive in Italy (38 respondents), this option was selected 13 times, which means 34%. While this is a higher number than average, it suggests that the symbol is still not well understood in Italy. From another perspective, the use of text “Lun Ven” seems to be recognized for a time limitation to weekdays: almost 60% selected in fact the correct option 5 indicating the scheme is not in force on Sundays.



### 3.2 The Netherlands



**Explanation:**

This zonal sign is our elaboration for the Netherlands and thus not existing. This is a Low Emission Zone in force all days/24h (permanent)



Vehicles excepted by the rule are:

- Cars and goods vehicles with two axles Euro 4 and higher
- Goods vehicles with three axles/buses/coaches Euro 6 and higher
- Authorised vehicles



An automatic number plate recognition (ANPR) enforcement system is in place.

**Correct answers:**

%Selected  
correctly    %Selected  
incorrectly

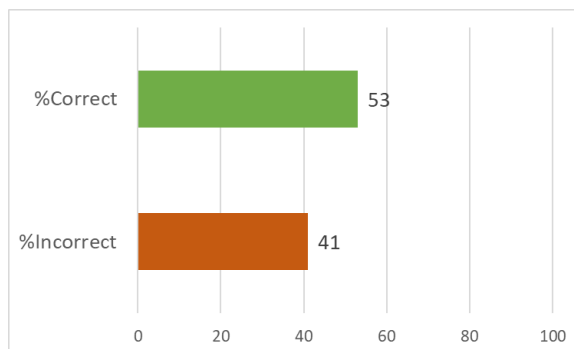
<input checked="" type="checkbox"/>	1) This is a Low Emission Zone (no access for polluting vehicles only).	60
<input type="checkbox"/>	2) This is a Zero Emission Zone (access for vehicles without polluting emissions only).	33
<input type="checkbox"/>	3) I need to have a specific sticker or permit to enter the zone.	27
<input checked="" type="checkbox"/>	4) The restriction is in force every day for 24 hours.	70
<input checked="" type="checkbox"/>	5) If my car is Euro 5, I can enter the zone at any time.	71
<input checked="" type="checkbox"/>	6) If my car is Euro 3, I need to ask for a permit/sticker to enter the zone.	10
<input type="checkbox"/>	7) Trucks labelled with sticker 5 cannot enter the zone.	64

**Results:**

The presence of the polluting car symbol largely improves the comprehension of the scheme as LEZ (as opposite to the results in question 1.3).

For question 3.2, the incorrect option selected most often was “Trucks labelled with sticker 5 cannot enter the zone”. This option was selected by approximately 64% of the respondents. This can be justified in the same way as question 1.3 where there is a misunderstanding between stickers and euro standards.

The correct answer selected less often was “If my car is Euro 3, I need to ask for a permit/sticker to enter the zone”, selected by only 10% of the respondents. This could be due to the lack of information about permits or stickers.



### 3.3 Spain



#### Explanation:

This zonal sign is our elaboration for Spain and thus not existing.

This is a Limited Traffic Zone in force all days/24h (permanent)

Vehicles excepted by the rule are:

- Bicycles
- E-scooters
- Taxis
- Authorised vehicles
- Vehicles doing loading and unloading operations on working days only, 8am-1pm and 4pm-6pm



An automatic number plate recognition (ANPR) enforcement system is in place.



The zone is also a residential/pedestrian priority area (see above the explanation).



Information and permits can be obtained via the indicated website and phone number.

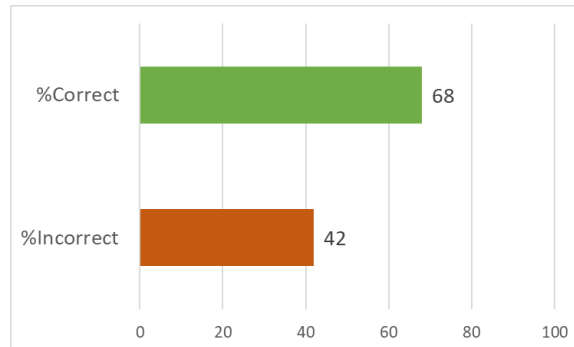
#### Correct answers:

		%Selected correctly	%Selected incorrectly
<input checked="" type="checkbox"/>	1) This is a Limited Traffic Zone (no access unless permitted).	81	
<input type="checkbox"/>	2) This is a Low Emission Zone (no access for polluting vehicles only).		8
<input checked="" type="checkbox"/>	3) The restriction is in force every day for 24 hours.	41	
<input checked="" type="checkbox"/>	4) Loading/unloading is allowed at specific time windows.	82	
<input type="checkbox"/>	5) I do not need to ask for a permit to load/unload goods at 9am.		46
<input checked="" type="checkbox"/>	6) If I cross a pedestrian, I am forced to give him/her priority.	66	
<input type="checkbox"/>	7) There's a surveillance system for security reasons.		74

#### Results:

The C,2 sign is correctly interpreted as LTZ. The incorrect option selected most often was "There's a surveillance system for security reasons". This option was selected by approximately 74% of the respondents. Perhaps this is because they are not expecting cameras to be used for UVAR enforcement. Moreover, the symbol 'surveillance camera' is standardized in ISO 7001 "Public information Symbols" and its function is only to indicate the location of the camera, while its purpose is still unexplained. Also, 46% of the respondents selected "I do not need to ask for a permit to load/unload goods at 9am". For this it would be useful to add a permit symbol sub-sign, as there was no sign indicating that permission

needs to be granted for deliveries. The presence of a symbol for loading/unloading operations makes in fact option 4 to be correctly selected by 82% of the respondents. Concerning the correct answers, overall, they were all selected several times, with none standing out significantly because of a lack of understanding.

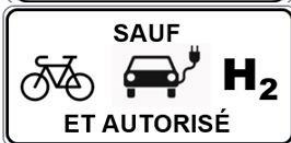


### 3.4 France



#### Explanation:

This zonal sign is our elaboration for France and thus not existing. This is a Zero Emission Zone in force all days/24h (permanent)



Vehicles excepted by the rule are:

- Bicycles
- Electric vehicles
- Hydrogen vehicles
- Authorised vehicles



An automatic number plate recognition (ANPR) enforcement system is in place.



Information and permits can be obtained via the indicated website and phone number.

#### Correct answers:

	%Selected correctly	%Selected incorrectly
<input type="checkbox"/> 1) This is a Limited Traffic Zone (no access unless permitted).		16
<input type="checkbox"/> 2) This is a Low Emission Zone (no access for polluting vehicles only).		55
<input checked="" type="checkbox"/> 3) This is a Zero Emission Zone (access for vehicles without polluting emissions only).	63	
<input checked="" type="checkbox"/> 4) I need to have a specific sticker or permit to enter the zone.	25	



<input checked="" type="checkbox"/>	5) If my car runs on hydrogen, I can enter the zone at any time.	82
<input type="checkbox"/>	6) If my car is 100% electrical, I need to ask for a permit/sticker to enter the zone.	11
<input checked="" type="checkbox"/>	7) Number plates are read by cameras for enforcement.	61

**Results:**

Answers provided for question 3.4 confirms that the use of symbols improves the comprehension of the schemes: in this case, 63% correct selection of ZEZ (probably facilitated by the electric car symbol) is counterbalanced by the 55% selecting also the LEZ option that is fact cannot be considered as properly wrong option whereas drivers understand the focus on emission restrictions other than a generic “no entry” as for the LTZ.

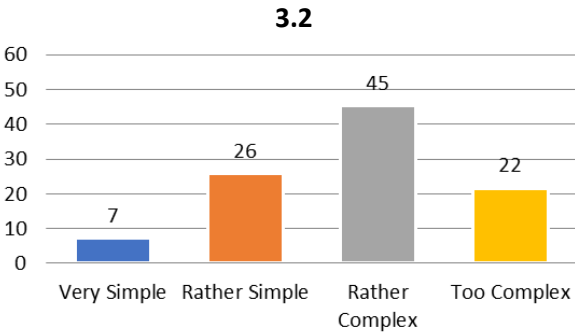
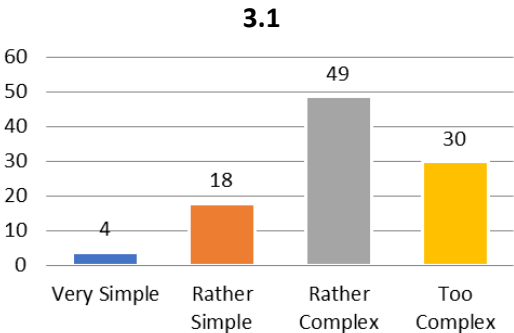
Again, the use of symbols (as said for the electric car but also for the camera enforcement and hydrogen) largely improve the overall understanding of the signal.

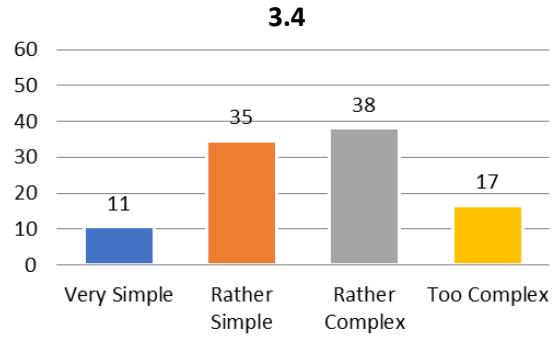
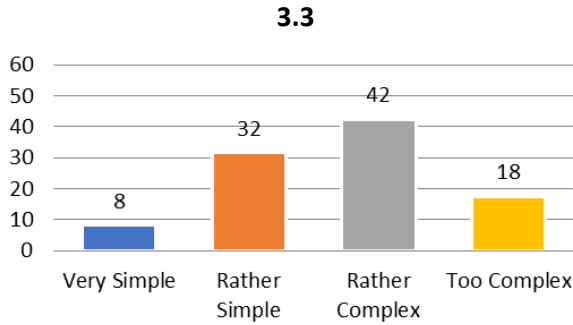
The correct answer selected less often was “I need to have a specific sticker or permit to enter the zone”, selected by only 25% of the respondents. This could be due to the lack of information about permits or stickers.

Category	Percentage
%Correct	58
%Incorrect	28

Overall, the mean %Correct rates increased when comparing them to the existing rates calculated for existing signage, however, there was no reduction in the mean %Incorrect.

- Complexity level of each sign (% of respondents)**

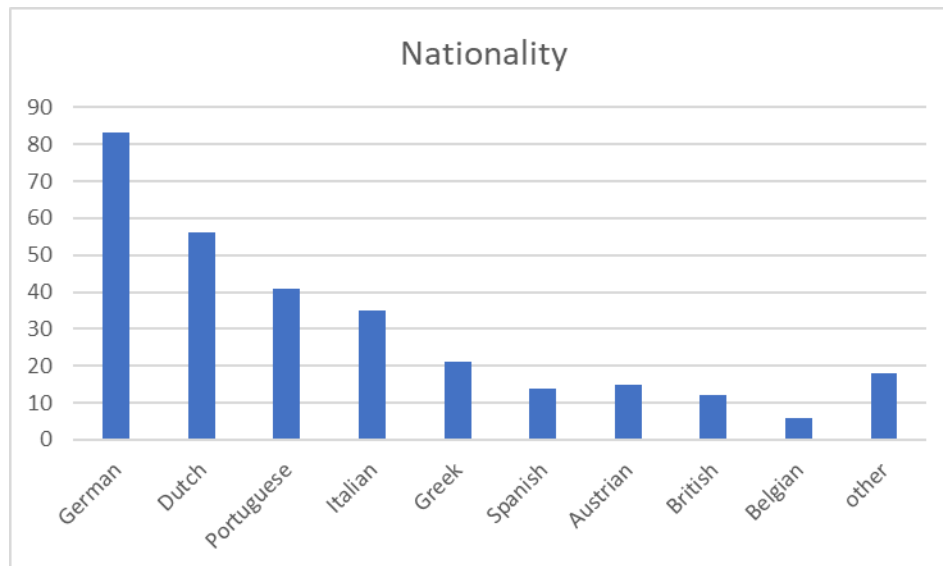


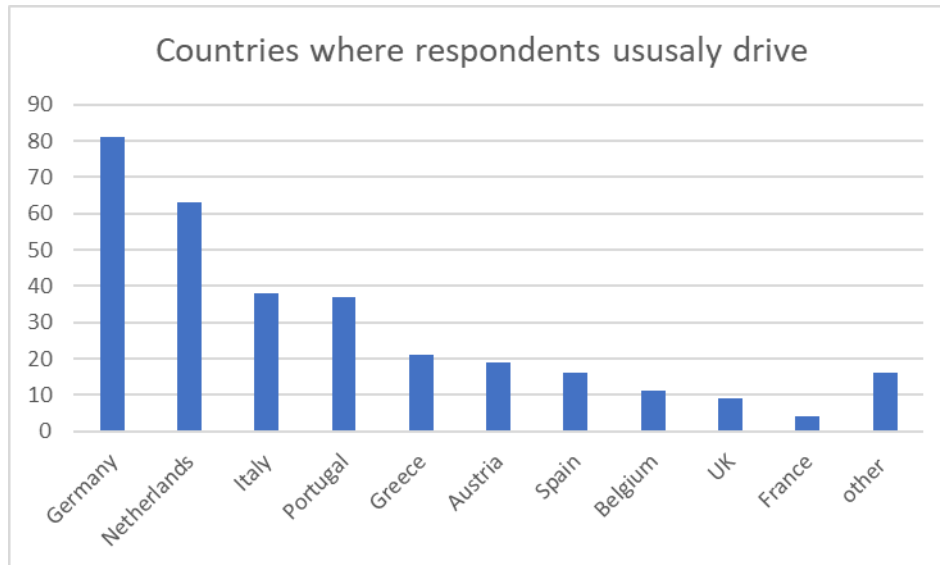


- The sign presented in 3.1 is the one rated with higher levels of complexity. This probably is due to the more complex scheme, and therefore the larger amount of information presented, especially in the exemptions panel.
- The Zero emissions sign presented in 3.4 is perceived by the respondents as simpler than the others. This is in fact a more compact signage as opposite to 3.1.
- Overall, answers are tendentially placed in the “rather simple” and “rather complex” options.
- Generally, the complexity rates were substantially lower for the proposed signage than for the existing signage. The “too complex” option had an average of 36% answers in the “existing signs” section, while the percentage was reduced to 21% in the “proposed signage” section. Within the same lines, the “rather simple” option increased from an average of 16% to 28%.

#### Section 4 – Driver identification and background

Below, a summary of the respondents’ characteristics and background is presented.

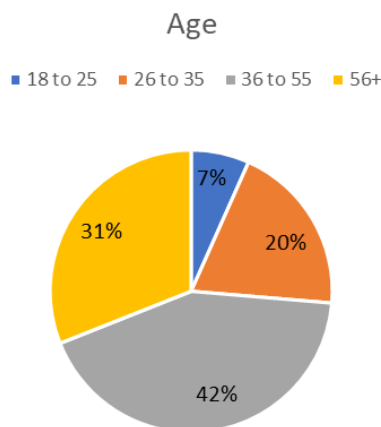




- % of respondents who are used to driving in foreign countries: 42%
- % of respondents with a background related to mobility and transport: 50%
- % of respondents who are aware of emission standards: 62%
- % of respondents who are aware of emission stickers in their country: 39%
- % of respondents who don't know if their country uses emission stickers: 22%
- % of professional drivers responding: 4%

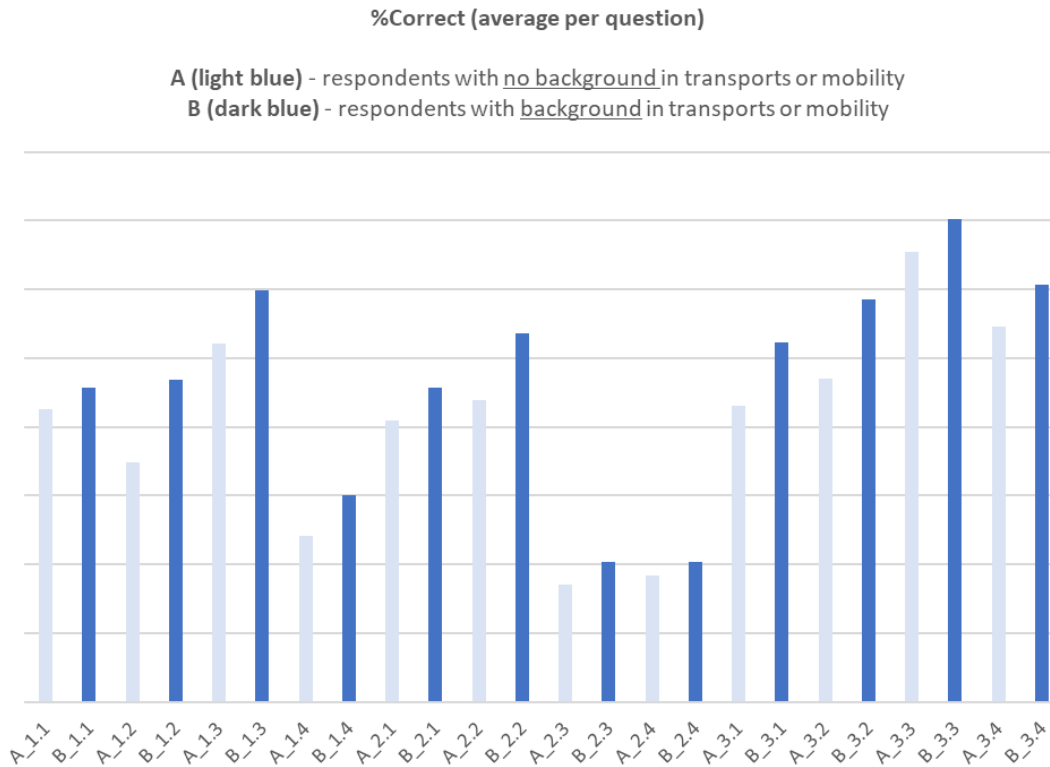
After a quick checking, it was possible to note that not all the respondents answered correctly about the applicability or not of emission stickers in their country, even besides having the “I don't know” option. This suggest that the concept is not well understood across Europe.

The graph below outlines the age categories of respondents.



Traffic signs are made for all road users. Thus, they must be as simple as possible considering that some of their content might not be understood by every “common driver” who is not aware of the content that was not explained in the driving lessons, which can be the case of UVARs and its related signage.

When asking for the respondents' background, it was aimed to understand if it influenced the responses. Half of the respondents were "common drivers" with no background on the theme, while the other half had some background on transport and mobility, for instance, related to their job or their education.



Looking at the chart above, it is possible to identify a tendency where the %Correct answers were always higher for respondents with a background in transport and mobility, but not by a huge amount. The average difference was 6,8%, but it varied between questions, ranging from 2,0 to 12,1%. The difference was generally greater for emissions-related signs, suggesting that for LEZs it is very useful to have general knowledge about LEZs rather than relying on the road sign to convey all the information). In that framework, it is relevant to mention that initiatives of this kind should always consider the views of the final users, which are, in most cases, regular citizens with no experience on the matter. Also, investing in training could help instruct the drivers and avoid misunderstandings of signage and the possible negative consequences adjacent to them.

## Section 5 - Summary of the general comments (open question) provided by respondents

### Language issues:

- Most signs depend on the local language. Other languages than English, which is widely known as a second language, and languages familiar to the respondent (based on nationality and the countries they usually drive) are hard to understand.

- Also, the more the language presented in the sign differs from the respondent's mother tongue, the more difficult it becomes to understand.
- For international visitors, minimal words should be used whenever possible.
- Some respondents suggest using English worldwide since it is the most transnational and understandable language.

**Need for harmonized symbols/signage:**

- Europe-wide standardisation is crucial.
- Respondents suggest that simplified pictograms work very well, especially because when you are driving a vehicle there is generally little time available to read the signs.
- Universal symbols must be agreed upon. Respondents acknowledge the need of creating new harmonised symbols, especially a common way to indicate low and zero emission zones, as well as limited traffic zones.
- Only one respondent indicated that he/she had trouble interpreting the red circle with the polluting car. For most respondents, the polluting car made it more likely that the scheme was correctly identified as an emissions-related scheme.
- The crossed hammer symbol is not used in several countries, therefore seems to be hard to understand.
- The crossed hammer provides a useful symbol for weekdays, but these are not (yet) well known in many countries, or even widely understood in the countries they are used.

**Amount of information:**

- The amount of information must be considered, (an aspect which was not possible to be made part of this survey, as it reflected the amount of information needed to be conveyed by different schemes). The signs need to be easily understood while driving (possibly with 50 km/h) without having to stop trying to comprehend a sign. Many of the signs have a lot of detail for a passing motorist to assimilate quickly which can result in a safety issue. This would suggest that the simpler the scheme is able to be, the easier this will be able to be correctly conveyed in a road sign.
- In general, the more information on the sign, the harder it to understand.
- Prohibition signs that have very extensive exceptions are hard to understand.
- One respondent suggested that more than one sign and two additional panels are almost impossible to read and be understood by a driver.

**Lack of knowledge about emission standards, stickers, or permits:**

- Information about stickers is hard to understand and sometimes not familiar to the respondent. Moreover, when we look at the correct answers selected less often, they are mostly related to the lack of information or knowledge about permits that might be needed.

**Other comments/suggestions:**

- Signage can be very difficult for a human to understand, but for a machine (such as an automated or autonomous vehicle) in the future, given good and harmonised road signage, should represent a much easier approach to a common understanding for some of the vehicles on the road.

However, while there are still drivers involved, the information in complex road signs would still need to be communicated to the driver without distracting them.

- Information about the need to register for approval and / or requiring a permit could be useful. Most drivers don't know if the permit requirement is needed, especially in foreign countries.
- QR code could be a good option for accessing the further online information about the UVAR. Whilst most mobile phone usage is forbidden while driving, the information could be accessed by passenger to be explored later.
- UVAR signs have not been part of the driving school classes, as they have only recently been introduced into the highway codes of different countries. Even if they are included into the current curriculum, most drivers have already passed their test, so wouldn't benefit from this. Investing in training and aware raising campaigns could be useful, not only for learner-drivers, but also for those who already own a driving license to be updated on the new developments on road signage. Working with, for example, transport trade bodies and automobile clubs to raise awareness of such road signs with existing drivers might be useful.
- One respondent indicates that sometimes he/she has trouble to distinguish between situations in which the signs apply or refer to exemptions.

## **Section 6 - Final remarks and conclusions**

While 306 respondents throughout Europe is a respectable sample given the time and context, a larger sample would be preferable before making more concrete conclusions. Also, to split out those that are drivers, from those that work on road signs.

Harmonisation of UVAR road signs would be a significant benefit. However, there may be a limit to the amount of information that can be expected to be conveyed by road signs alone. The fact that those working in transport found the emissions signs easier to understand seems to suggest that greater general information dissemination about the emissions stickers and low emission zones would be useful, rather than relying solely on the road sign to convey all the information on the scheme. The simpler the scheme is able to be, the easier the way information can be correctly conveyed in a road sign.

The new signs are more easily understood than the current signs, although they are still not 100% correctly interpreted by the respondents. Of the new signs, those that were least well understood were the camera enforcement sign and the difference between stickers and Euro standards. The crossed hammers provide a useful symbol for weekdays, but these are not (yet) well known in many countries, or even widely understood in the countries they are used. An additional sub-sign to represent the need for a permit or other permission to have been granted before entry would be useful.

These new signs are going to be most relevant to countries starting to implement new types of UVARs. The costs – both in Euros and additional confusion of national drivers – of changing existing signs needs to be considered pragmatically, although additional panels may be of potential relevance. Investing in training and aware raising campaigns could be useful, not only for learner-drivers, but also for those who already own a driving license to be updated on the new developments on road signage. Working with, for example, transport trade bodies and automobile clubs to raise awareness of such road signs with existing drivers might be useful.