Support study for Impact Assessment of Cooperative Intelligent Transport Systems

Analysis of responses to the Open Public Consultation
Report for DG MOVE
In November 2012, Ricardo plc acquired the assets and goodwill of AEA Technology plc and formed a new company, Ricardo-AEA Ltd. The entire capability and resources previously represented by AEA Technology plc were transferred to Ricardo-AEA, as were all employees. Consequently, where specific projects or track record referenced in this proposal were undertaken and completed prior to the acquisition, for contractual reasons, these continue to be identified as AEA Technology plc.
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Support study for Impact Assessment of C-ITS – Analysis of responses to open public consultation

This is the report on the response to the Public Consultation (PC) for the ‘Support study for Impact Assessment of Cooperative Intelligent Transport Systems” reference MOVE/B4/2016-239 (hereafter the ‘project’).

This report is submitted by Ricardo and TEPR, the consultants appointed to conduct this study. This report provides a summary of the process and results from the Public Consultation.

The Public Consultation was launched by the European Commission (DG MOVE) on 10th October 2017 and was open for responses until 5th January 2018 (12 weeks). An extension for the receipt of responses was agreed until 12th January 2018 (bringing the total to 13 weeks).

This report contains the following sections:

- **Section 1, Analysis of respondents’ profile**: A brief overall profile is provided of the respondents by stakeholder type, Member State and any other relevant characteristic requested in the questionnaire (such as their main area of professional interest), along with a comment on the size and representativeness of the sample. We have indicated also whether all stakeholder groups of interest have been sufficiently engaged;

- **Section 2, Analysis of responses**: For each question, there is a graph presenting the responses to the closed question, as well as text to summarise the findings in the graph. We have highlighted any particular groups of stakeholders or regions that held particular views. Where stakeholders have been able to provide comments, we have provided a qualitative discussion of these.

- **Section 3, Analysis and summary of ad hoc responses**: The final section summarises additional ad hoc responses: ad hoc responses, such as those from stakeholders who chose to provide a written response instead of answering the questionnaire, which is the approach typically taken by some Member States, as well as reports submitted to support a stakeholder’s questionnaire response. We have summarised Member States’ views separately from those of other stakeholders.

Please note that the views presented can only be associated with respondents to this specific consultation and may not be representative of the views of all or specific groups of stakeholders.
1. Analysis of respondents’ profile

A total of 139 responses to the questionnaire were received. The responses covered a variety of stakeholder groups, as shown in Table 1-1.

Table 1-1: Classification of stakeholders responding to the questionnaire

<table>
<thead>
<tr>
<th>Stakeholder group</th>
<th>Number of responses</th>
<th>% of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>On behalf of a private company</td>
<td>40</td>
<td>29%</td>
</tr>
<tr>
<td>On behalf on an association</td>
<td>37</td>
<td>26%</td>
</tr>
<tr>
<td>On behalf of a public authority (ministry, agency, other form of public administration, at national, regional or local level)</td>
<td>32</td>
<td>23%</td>
</tr>
<tr>
<td>As a citizen (in own capacity)</td>
<td>11</td>
<td>8%</td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
<td>8%</td>
</tr>
<tr>
<td>On behalf on a non-governmental organisation</td>
<td>8</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>138</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Notes: ‘Other’ is based on the respondents’ choice and includes: two research centres/institutes, an industry association, a public utility company, a road authority/operator cooperating within the European ITS Platform, a university researcher on C-ITS, a stakeholder with trade, business or professional association, a Polish municipal company, an MS expert, a citizen but as a nominated member state expert on C-ITS and a public Institution with Industrial and Commercial Character.

Responses were received from respondents residing in, or organisations based in 18 EU Member States (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Italy, Latvia, Luxembourg, Netherlands, Poland, Portugal, Slovak Republic, Spain, Sweden, and United Kingdom). A further 5 responses were received from Israel, Norway, Switzerland, and an EU-wide representative. The distribution of responses by country of residence or establishment is shown in Figure 1-1. The largest number of responses was from Belgium and Germany, which contributed 56 responses between them (41% of the total).
In terms of the geographical distribution of respondents (EU-15 and EU-13 membership), the majority (119 out of 138; 86%) are from EU-15 Member States, with only 11 (8%) from EU-13 and eight from other countries including Norway, Israel, Switzerland and unknown.

The 139 respondents to the survey represent a broad range of interests that can be grouped into various subcategories (see Table 1-2: Vehicle and equipment manufacturers/suppliers/repairers’ interests were indicated 33 times (23% of responses), followed by road and transport operators (18 times, 13%). The interests of ITxS service providers and telecommunication were indicated, in total, 15 times (10%) with five more respondents referring to the interests of associations representing automotive replacement parts (4%). Authorities’ interests (including national, regional and local) were indicated 27 times (19%), together with four more referring to road authorities’ interests (3%). Another 21 responses also indicated interests in societal and/or consumer rights, research/academia/consultancies, or as road users.

We note that the number of responses (142) was greater than the number of respondents (139) because a few respondents associated themselves with more than one stakeholder group (three).
Table 1-2: Classification of respondent interests (more than one response from respondents possible)

<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Number of responses</th>
<th>% of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle and equipment manufacturers/suppliers/repairs</td>
<td>33</td>
<td>23%</td>
</tr>
<tr>
<td>Road/transport operators</td>
<td>18</td>
<td>13%</td>
</tr>
<tr>
<td>Regional or local public authorities</td>
<td>14</td>
<td>10%</td>
</tr>
<tr>
<td>National Public Authorities</td>
<td>14</td>
<td>10%</td>
</tr>
<tr>
<td>Societal interests and/or consumer rights</td>
<td>11</td>
<td>8%</td>
</tr>
<tr>
<td>Research/Academia/Consultancies</td>
<td>9</td>
<td>6%</td>
</tr>
<tr>
<td>ITS service providers</td>
<td>9</td>
<td>6%</td>
</tr>
<tr>
<td>Telecommunications providers</td>
<td>6</td>
<td>4%</td>
</tr>
<tr>
<td>Associations representing automotive replacement parts</td>
<td>5</td>
<td>3%</td>
</tr>
<tr>
<td>Road authorities</td>
<td>4</td>
<td>3%</td>
</tr>
<tr>
<td>Unknown</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Road user</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>142</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Notes: Other is based on: insurers, car rental companies, vehicle and infrastructure testing/inspection and certification services, one NGO with a target group of citizens with mobility disabilities and another NGO coordinating road safety at national level, public and private sector representatives/organisations (including related to whole-life vehicle compliance), a stakeholder with cement and concrete interests in transport infrastructure, independent or MS experts, and an association.

In addition to the responses to the questionnaire, 46 additional contributions and position papers were submitted (discussed in Section 3).

Following the introduction section, the questionnaire was split into three main sections: (1) background; (2) problem definition; and (3) impacts. Table 1-3 below presents the total number of responses for each question in the three sections. A larger number of respondents provided answers to multiple choice questions compared to the free text responses.

Table 1-3: Total number of responses for questions in Sections 1, 2 and 3

<table>
<thead>
<tr>
<th>Questions</th>
<th>No. of responses</th>
<th>Questions</th>
<th>No. of responses</th>
<th>Questions</th>
<th>No. of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>136</td>
<td>Q4</td>
<td>135</td>
<td>Q17</td>
<td>134-136</td>
</tr>
<tr>
<td>Q2</td>
<td>135</td>
<td>Q5 (free text)</td>
<td>119</td>
<td>Q18 (free text)</td>
<td>88</td>
</tr>
<tr>
<td>Q3</td>
<td>135-136</td>
<td>Q6</td>
<td>133-136</td>
<td>Q19 (free text)</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q7 (free text)</td>
<td>102</td>
<td>Q20</td>
<td>132</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q8</td>
<td>133-136</td>
<td>Q21 (free text)</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q9 (free text)</td>
<td>97</td>
<td>Q22 (free text)</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q10</td>
<td>132-135</td>
<td>Q23 (free text)</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q11 (free text)</td>
<td>78</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q12</td>
<td>123-133</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q13 (free text)</td>
<td>96</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q14</td>
<td>131-132</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q15 (free text)</td>
<td>98</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Q16 (free text)</td>
<td>85</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Finally, the analysis of the responses also suggested that a total of 30 responses (22% of total responses) were coordinated, following a template for answers. In total, 11 different templates were identified from the analysis of the sample, as shown in Figure 1-2.

All coordinated responses identified had two or three participants, except for Coordinated Response 1, which had seven participants. The majority of this group (six) were responding on behalf of an association (and one on behalf of a private company), and all represent interests in automotive replacement parts associations. The respondents reside in, or have organisations based in Belgium, Germany, Italy, Poland, Sweden and United Kingdom. Since respondents were free to adapt the answers to express their own views, coordinated responses have been analysed individually in the following sections.

Figure 1-2: Distribution of the responses by stakeholder group – showing coordinated responses
2. Analysis of responses

In this section we present the responses to the main questions of the consultation. The responses are analysed in the subsequent sections as follows:

- Section 2.1: Questions 1-3 (Background), 3 questions.
- Section 2.2: Questions 4 to 16 (Problem definition), 13 questions.
- Section 2.3: Questions 17 to 23 (Impacts), 7 questions.

When analysing the results of close-end questions, we present an analysis of the responses by all stakeholders to all options provided. Furthermore, due to the high number of options in some questions, we present a more detailed breakdown of the responses by stakeholder group for a selected number of questions, typically those with the highest share of positive or negative responses.

2.1 Background

2.1.1 Q1: How familiar are you with cooperative intelligent transport systems? (n=136)

Out of the 136 responses received, 88 (65%) indicated that they were very familiar with cooperative intelligent transport systems (Figure 2-1). Forty-seven respondents (34%) stated they were somewhat familiar, while only one respondent indicated they were not at all familiar.

Figure 2-1: Response on familiarity of cooperative intelligent transport systems (n=136)

As Figure 2-2 highlights, when disaggregated by stakeholder group, the highest level of familiarity with cooperative intelligent transport systems was indicated by private companies and other types of stakeholders (29 out of 39 (74%) and eight out of 10 (80%) being very familiar respectively). Every stakeholder group had at least 50% of respondents that were very familiar, except for NGOs where only 38% (three out of eight) respondents stated this.
2.1.2 Q2: How familiar are you with the ITS Directive and the EU actions to support the deployment of intelligent transport systems? (n=135)

From the 135 responses received, 78 (58%) indicated that they were very familiar with the ITS Directive and EU actions to support the deployment of ITS, and a further 50 (37%) stated that they were somewhat familiar (see Figure 2-3). In comparison, only seven respondents (5%) indicated they were not at all familiar with the directive and EU actions.

Figure 2-3: Response on familiarity of the ITS Directive and EU actions to support the deployment of intelligent transport systems (n=135)

Figure 2-4 shows that, when disaggregated by stakeholder group, the highest level of familiarity with the ITS Directive and EU actions to support the deployment of ITS was given by other types of stakeholders (eight out of 10; 80%). All other stakeholder groups had between 44% and 64% of respondents indicating they were very familiar and the remainder mostly having stated somewhat familiar. The stakeholder groups with respondents indicating they were not at all familiar were mostly private companies and public authorities, however this amount was small (three out of 39 and three out of 31 respectively).
2.1.3 Q3: How familiar are you with the following initiatives in the area of cooperative, connected and automated mobility? (n=135-136)

As shown in Figure 2-5, a large proportion (between 67-95%) of respondents stated they were either very familiar or somewhat familiar with all initiatives shown, except for the initiative ‘EATA Roundtable’ where only 44% indicated this. The initiative ‘C-ITS Platform’ had the largest familiarity with 88 out of 136 respondents stating they were very familiar, whereas this was 49-51 out of 135-136 for initiatives ‘C-ROADS Platform’, ‘GEAR2030’, ‘Horizon 2020’ and ‘Letter of Intent’, and only 28 out of 135 for the ‘EATA Roundtable’ initiative. The number of respondents who stated they were not at all familiar ranged from <1% for the ‘C-ITS Platform’ initiative to 56% for ‘EATA Roundtable’ initiative.

When analysing responses by different stakeholder groups, consensus between the stakeholders was identified in most areas. There was an almost identical split within each stakeholder group when looking at the most familiar ‘C-ITS Platform’, ‘Horizon 2020 research activities’, ‘Letter of Intent’ and the least
familiar ‘EATA Roundtable’ (see Figure 2-6). For example, at least 52% of respondents from all stakeholders indicated they were very familiar with this initiative. A small number of respondents on behalf of private companies, public authorities and citizens indicated they were not at all familiar (one-three), however this is not considered significant.

Figure 2-6: Response on the familiarity with the initiative ‘C-ITS Platform’ in the area of cooperative, connected and automated mobility, by stakeholder group

2.2 Problem definition

The next 13 questions of the PC cover the current C-ITS problem, which the Commission describes as follows:

“Today some C-ITS are already technically mature: the technological capabilities among market parties are increasing, and vehicle manufacturers intend to launch series of vehicles with selected C-ITS technology on board by 2019. However, the Commission considers that deployment is being delayed due to several barriers and uncertainties, and Europe risks seriously falling behind other regions in the world if it fails to act soon. Without a clear legal framework, C-ITS deployment is expected to remain slow and fragmented, resulting in interoperability issues and hindering continuity of services. This in turn will hinder the deployment and uptake of C-ITS and the realization of their full benefits, in particular with regards to road safety and traffic efficiency.”

2.2.1 Q4: Do you agree with the assessment above? (n=135)

Out of the 135 responses received, 110 (81%) indicated that they strongly agreed or agreed with the assessment above, in that C-ITS deployment is being delayed due to several barriers and there is a risk of Europe falling behind other regions unless a clear legal framework is put in place (see Figure 2-7). Another 14 respondents (10%) stated that they neither agreed nor disagreed with this statement, while in comparison, only nine (7%) indicated they disagreed or strongly disagreed.
Figure 2-7: Response on agreement of the assessment above in terms of current mature C-ITS technology and the need for a clear legal framework (n=134)

Figure 2-8 highlights that, when disaggregated by stakeholder group, the level of agreement is split approximately equally, with at least 77% of respondents from all stakeholders having agreed or strongly agreed with the assessment. Private company, association, and NGO respondents were most strongly in agreement in terms of at least 50% indicating they strongly agreed. Respondents who disagreed or strongly disagreed were mostly from private companies, associations or public authorities, however this amount is small (1-10%).

Figure 2-8: Response on agreement of the assessment above in terms of current mature C-ITS technology and the need for a clear legal framework, by stakeholder group

When analysed by stakeholder interest\(^1\), as shown in Figure 2-9, the level of agreement was again split fairly equally, with at least 60% of respondents from all interests having agreed or strongly agreed with the assessment. Respondents with interests in vehicle & equipment manufacturers/suppliers/repairs,

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\(^1\) Analysis by representing interest included only those respondents who indicated one representing interest (139 out of 142), to avoid double counting.
societal or consumer rights, research/academia/consultancies and automotive replacement parts were most strongly in agreement in terms of at least 55% indicating they strongly agreed.

Figure 2-9: Response on agreement of the assessment above in terms of current mature C-ITS technology and the need for a clear legal framework, by representing interest

<table>
<thead>
<tr>
<th>Group</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree nor disagree</th>
<th>Strongly Disagree</th>
<th>No opinion / I don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle &amp; equipment manufacturers/suppliers/repairs (n=29)</td>
<td>16</td>
<td>15</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Road/transport operators (n=16)</td>
<td>19</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Regional or local public authorities (n=14)</td>
<td>10</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>National public authorities (n=14)</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Societal interests &amp;/or consumer rights (n=11)</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Research/Academia/Consultancies (n=9)</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>ITS service providers (n=7)</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Automotive replacement part associations (n=5)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Telecommunications providers (n=5)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Road authorities (n=4)</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unknown (n=2)</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Road user (n=1)</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other (n=15)</td>
<td>8</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

2.2.2 Q5: Please elaborate on your answer to the previous question (n=119)

One hundred and nineteen respondents (86%) elaborated on their answer to the previous question. Thirty three of these were from associations, a further 37 were from private companies, 29 were from public authorities and seven each came from NGOs and from citizens. A further six came from respondents who categorised themselves as ‘other’.

Three main issues were mentioned by respondents from associations that strongly agreed with the European Commission’s assessment:

1. the need for there to be access to in-vehicle data;
2. the need to provide clarity and certainty for investment; and
3. the need to ensure that the same C-ITS systems can operate across Member State borders.
A similar comment repeated by six European and national trade associations representing distributors of replacement automotive parts and diagnostic tools (and one private company) called for legislation to ensure interoperable access to the vehicle and its data, as well as the ability to exchange data remotely with the vehicle. It was argued that OEMs are currently developing specific solutions separate from their competitors, which will reduce consumer choice and lead to higher prices, thus not delivering the full benefits of C-ITS. If legislation were to address this, it was argued that it would lead to a wider variety of services from which authorities would be able to choose. Two other national associations in the same industries made a similar point, as did a European and national association representing insurers, which called for the Commission to build on the work of the C-ITS Platform in this respect.

Those strongly agreeing with the Commission’s assessment that called for action to improve the clarity of the legislative framework included two associations representing motor vehicle inspectors, which underlined the need for interoperability between all vehicles and all roadside units, as well as backward interoperability. Those emphasising the need for certainty for investors included associations representing automotive suppliers and road surfacing interests. A group representing ITS interests strongly agreed with the Commission’s assessment, as it supported the need for interoperability between vehicles, backward compatibility and also cross-border interoperability.

Those associations that agreed with the Commission’s assessment raised similar concerns to those associations that had strongly agreed, in addition to some others. Two associations representing transport operators provided a repeated response that without a certain level of common standards, there was a risk that monopolies of manufacturers and technology dependence might occur. An association representing road operators called for a clear legal framework to support investment, in general, and particularly in relation to the ITS G5 band of the radio frequency spectrum. A national consumers’ association highlighted the risk of fragmentation posed by the development of different legislative frameworks in different Member States. In this respect, they noted that while the General Data Protection Regulation (GDPR) applies to personal data, there is currently no similar framework for handling non-personal data.

A vehicle manufacturers association, supported by two manufacturers, raised concerns about the potential implications for manufacturers of the way in which the GDPR might be applied to C-ITS and the way in which the Draft European Electronic Communications Code covers C-ITS. While generally agreeing with the Commission’s assessment, an association representing telecommunications interests disagreed with the Commission’s assertion that the stated C-ITS technologies were technologically mature, highlighting fifth generation mobile communications technology. In this respect, it underlined that legislation should not prejudice the outcome of a market-led approach and so allow, and not disincentivise, the development of new technology. An association representing road operators also noted that the choice of technologies should be left to the market.

The interaction between different road users, including those not equipped with C-ITS technology, was raised by some associations. An association representing the bicycle industry noted that there is, as yet, no standard protocol to link modes to each other, although this was being developed in a non-integrated manner at the local and project level. A similar argument was made by an equipment supplier. While supporting the need for a relevant policy framework, an association representing consumers was concerned about the impact on road users not equipped with C-ITS, particularly vulnerable road users, and so called for legislative action only when there was a clear safety and environmental benefit for society as a whole. Another association representing road users, while also supporting the Commission’s assessment of the need for action, questioned the assertion that C-ITS would have an impact on road safety. A third association representing road users noted that there remain outstanding issues around costs and business models.

Four associations set out their reasons for neither agreeing nor disagreeing with the Commission’s assessment. A city network argued that the Commission’s assessment was relevant to motorways, but not to urban areas, where the problems are different and the main challenge is to understand which urban transport problems C-ITS can contribute to solving. An association representing public transport operators agreed with the need for a clear legal framework, and noted that this needed to harmonise and standardise communication exchanges, to promote the development of inter-compatible systems and to protect data and address cybersecurity. They did not support the assertion that the C-ITS technologies were mature, although noting that manufacturers were putting these onto the market. However, they were concerned that the debate was being led by manufacturers, often without the engagement of public transport operators, which risked ignoring how C-ITS could meet wider societal goals. They also noted that the transition to a vehicle fleet that was fully equipped with C-ITS could take
more than a decade, and that further consideration needed to be given to the implications of this. Similar concerns were raised by a public transport operator and an association representing transport companies, which had disagreed with the Commission’s assessment. An association representing road operators believed that the Commission’s assessment was only a partial view, as it did not reflect the real needs in the market, so risked leading to similar issues that have been experienced in relation to the European Electronic Toll Directive. They also argued that there was a need to protect and enhance what had already been done by many road operators.

Two associations representing telecommunication interests explained their reasons for disagreeing with the Commission’s assessment. One of these, while recognising the importance of a legal framework, underlined their support for a technology-neutral approach, so an approach under which market players, not policy makers, decided which technology should prevail. The other made a similar argument that specifying a specific connectivity option for C-ITS would not enable its full benefits to be realised, as it would potentially lock Europe into old technology standards, whereas the need for a clear path towards the potential benefits of 5G should be retained. A similar argument was made by an equipment supplier.

Similar themes were raised by private companies that strongly agreed or agreed with the Commission’s assessment. One supplier underlined that as their business was EU-wide, an EU policy framework was needed. Three companies noted that different approaches in different Member States was not conducive to EU-wide interoperability or to low costs, while three underlined the need for EU action to ensure cross-border interoperability. Several companies also noted that EU action was needed to address particular issues, including security (an ITS service provider), privacy and security (a supplier) and the need for an agreed a set of standards (a vehicle rental company). A vehicle inspection and certification company called for action to ensure that there was open competition and that all service providers, including third party providers, were treated in an equal, fair and non-discriminatory manner. A supplier noted that C-ITS should not put drivers that were not equipped with C-ITS at risk.

An ITS service provider, a vehicle rental services company and an aftermarket service provider raised the issue of access to in-vehicle data, calling for this to be ensured. The former also noted that the GDPR and the ePrivacy Regulation, which was under development, did not deal well with C-ITS, as they were based on out-of-date concepts. A vehicle manufacturer also noted that the GDPR and cybersecurity needed to be addressed. Another company underlined that GDPR was a useful first step, but did not go far enough.

Other issues each raised by a number of companies included the need for policy action to ensure the implementation of beneficial C-ITS technology (seven companies), which otherwise no-one would be willing to pay for, and to bring together actors in different industries that were not used to working together (two companies). Five companies raised the debate about which communications technology should be used. A vehicle manufacturer disagreed with the telecommunications industry’s desire to use the same bandwidth of the radio frequency spectrum that has been allocated to DSRC for C-V2X (5G). Four suppliers noted that this debate was potentially putting vehicle manufacturers off from taking decisions and so delaying the roll-out of C-ITS.

A company that had no opinion on the Commission’s assessment called for a better alignment between e-mobility and C-ITS, as the latter could act as an enabler for e-mobility solutions. Three companies explained why they had disagreed with the Commission’s assessment. A telecommunications provider argued that vehicle connectivity can be achieved by making the most of the fact that each car generally has at least one smart phone, and that there is a willingness on the part of manufacturers and road authorities to make data available. The company was concerned that the mistakes of the eCall Regulation, which they believed had locked in an outdated technology, will be repeated. A manufacturer disagreed as most of the Day 1 and Day 1.5 services are already being deployed in vehicles, while a consultancy felt that it would be a mistake to prescribe a solution for C-ITS at this point, as the technology cannot be considered mature.

A common issue raised by ten public authorities was the need for a policy framework that will provide clarity for investment, either that which they might undertake themselves, or which others might undertake. Three authorities noted that the debate over the alternative short-range communications technologies had not been helpful in this respect. One public authority underlined the need to invest in transport infrastructure, as well as in communications network infrastructure, in order to deploy C-ITS, while another noted the importance of avoiding the fragmented implementation of C-ITS. A third suggested that the main obstacle was a lack of a “mutually, well-coordinated business model” involving government and the market.
A national ministry underlined that there was a need to take account of the situation in different countries when deploying C-ITS, while a national road office listed a number of issues that needed to be addressed, including data protection, balancing responsibilities between different stakeholders, cyber security and the coordination of different services and means of communication. One region involved in the roll-out of C-ITS noted that only vehicle manufacturers knew which C-ITS they were planning to implement in their vehicles, which it considered to be a challenge to introducing the right infrastructure. One municipality considered the lack of public support to be the most important obstacle to the roll-out of C-ITS, while also noting that the transition between motorway and urban areas has not been addressed and that many municipalities do not have the necessary skills, resources and infrastructure to support the roll-out.

Five public authorities explained why they neither agreed nor disagreed with the Commission’s assessment. One noted that developments are occurring, but that uncertainties around the ownership of vehicle-related data will hinder the roll-out of C-ITS, while the role of the public versus the private sector in deploying the digital infrastructure was not clear and often varies between Member States. A national ministry suggested that falling behind other parts of the world was not an issue, as nowhere was there a clear legal framework for C-ITS, so time should be taken to develop the right framework for the EU. A municipality noted that, while the EU might be falling behind some other parts of the world overall, some Member States can be considered to be at the forefront of C-ITS deployment, while another suggested that Europe should look to the USA where they believed that legislation encourages C-ITS to be implemented. A national ministry commented that no C-ITS was yet technically mature, although some were close to being so, although they noted that the maturity of a technology also depended on whether it provided a clear added value to end users. They noted that there were still obstacles in this respect, so appropriate regulation at the EU level was needed.

Those public authorities that disagreed with the Commission’s assessment noted that it was not clear that all manufacturers would introduce C-ITS, that it was not really clear what vehicles can be considered to be fitted with C-ITS or that it was the disproportionate investments needed that was the main barrier to C-ITS deployment.

The NGOs that agreed with the Commission’s assessment, supported their conclusion for various reasons, including that a legal framework was needed: to ensure that the safety benefits of C-ITS were delivered in practice; to reduce implementation barriers; to improve coordination between Member States; and to coordinate the actions of different actors involved in transport. One NGO representing cyclists noted the current uncertainties with respect to the choice of short-range communication technology, while also noting that the draft revision of the EU Regulations on vehicle safety did not mention C-ITS.

Another NGO, representing cyclists, neither agreed nor disagreed with the Commission’s assessment. They questioned the supposition that C-ITS has mainly positive benefits, noting instead that the deployment of C-ITS might make car use more attractive, and thus act counter to many cities’ aim to deliver modal shift away from car use. In this respect, it was suggested that a broadening of C-ITS to include other modes, including bike sharing and apps for more vulnerable modes, should be considered. They also suggested that C-ITS could potentially be a distraction to car drivers, which risked negatively affecting the safety of other road users, whereas some technologies, such as Intelligent Speed Assistance, would clearly have safety benefits and so should be prioritised.

The five citizens who explained their reasons for agreeing with the Commission’s assessment provided similar reasons to those already mentioned by other stakeholders. One citizen underlined that a legal framework was needed to determine all potential liabilities, as well as to address the potential problem of hacking to ensure the safety of users, while another noted that EU level governance was needed to reduce uncertainty for early adopters of C-ITS. Two citizens underlined the need for EU level coordination and standardisation to be able to properly test C-ITS in real-world conditions, with one of these underlining that this would increase European experience and so better inform the EU legislative framework than if the EU adopted standards from elsewhere in the world. Another noted that EU action was necessary as a result of the many actors involved, some of which may not necessarily be acting in the wider interests of society.

One citizen who neither agreed nor disagreed with the Commission’s assessment underlined that the Commission needs to complement market forces in ensuring the deployment of C-ITS. Another suggested that the Commission’s assessment was premature with respect to the maturity of C-ITS technologies.
Similar issues to those raised by other stakeholders were also raised in support of the Commission’s assessment by those who classified themselves as ‘Other’ including:

- the need to avoid fragmented implementation of C-ITS;
- to ensure cross-border interoperability;
- to address a lack of regulatory certainty hindering investment; and
- to improve the availability of data.

One respondent highlighted that it was also important to implement policies that encouraged the purchase and installation of C-ITS on existing vehicles and to enable road operators to distribute the same information through navigation devices and mobile applications.

### 2.2.3 Q6: From your point of view, how important is the contribution of these drivers to the overall problem? (n=133-136)

Table 2-1 below presents the list of drivers being considered in terms of their importance in contributing to the overall problem (Very important, moderately important, of little importance, not at all important, no opinion/I don’t know).

**Table 2-1: Drivers considered for Question 6**

<table>
<thead>
<tr>
<th>Driver No.</th>
<th>Drivers contributing to the overall C-ITS problem:</th>
<th>Shortened name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>6a</td>
<td>The costs of C-ITS remain too high due to the fragmented deployment of separate C-ITS services and ecosystems</td>
<td>‘Costs too high’</td>
</tr>
<tr>
<td>6b</td>
<td>Failure to establish confidence in the cyber-security of C-ITS communications</td>
<td>‘Low cyber-security confidence’</td>
</tr>
<tr>
<td>6c</td>
<td>Public acceptance remains limited due to unclear principles related to privacy and protection of personal data</td>
<td>‘Privacy/data concerns’</td>
</tr>
<tr>
<td>6d</td>
<td>Incompatible communication technologies and frequency spectrum allocation</td>
<td>‘Incompatibilities’</td>
</tr>
<tr>
<td>6e</td>
<td>Uncertain minimum requirements for interoperability of C-ITS services</td>
<td>‘Uncertain interoperability’</td>
</tr>
<tr>
<td>6f</td>
<td>Uncertain minimum requirements for compliance assessment for C-ITS services</td>
<td>‘Uncertain compliance’</td>
</tr>
</tbody>
</table>

A large number of respondents (94-109 out of 133-136 (70-80%)) felt that all drivers presented above were either very important or moderately important in terms of contributing to the current overall problem faced by C-ITS (see Figure 2-10). In terms of those considered to be very important, the driver ‘uncertain interoperability’ (6e) was indicated most with 69 responses (51%), compared to just 32 (24%) for ‘uncertain compliance’ (6f). For all drivers, the number of respondents who felt they were of little importance or not at all important was small (20-30; 15-22%).
When responses were analysed by stakeholder group, associations generally showed the highest level of agreement of importance for all drivers discussed (when considering very important and moderately important). For example, when considering the driver ‘low cyber-security confidence’ (6b), 33 out of 36 (92%) associations indicated it was very important or important (see Figure 2-11). In general, private company respondents indicated least importance for all drivers (‘of little importance’ and ‘not at all important’) – for example nine out of 39 (23%) when considering low cyber-security confidence.

When analysed by stakeholder interest in general concensus was seen for all drivers. For example, as shown in Figure 2-12, when looking at the driver ‘uncertain compliance’ (6f) at least 57% of respondents from all interest groups stated it either very important or important. Respondents representing interests in vehicle and equipment manufacturers/suppliers/repairs tended to indicate the least importance for all drivers, for example 11 out of 30 for ‘uncertain compliance’ (21-37% across all drivers).
2.2.4 Q7: Do you consider that any drivers underlying the problem are missing? Please elaborate \((n=102)\)

One hundred and two respondents had a view on whether there were any drivers missing from the list provided, of which 27 came from associations and 32 were from private companies. A further 24 responses were from public authorities, seven from NGOs and six each were from citizens and those who categorised themselves as ‘other’.

As with the responses to question 5, there were six repeated responses from \textit{associations} representing distributors of replacement automotive parts and diagnostic tools (and one private company), which identified a driver of the problem being the fact that the current way in which
implementation of C-ITS is being taken forward was based on “individual vehicle manufacturer’s proprietary systems”, which prevented access to in-vehicle data. Two associations representing insurers also felt that a lack of concrete action to enable access to in-vehicle data was a major factor preventing the deployment of C-ITS.

From the perspective of a vehicle manufacturers’ association (and two manufacturers), a missing driver was the fact that different road authorities made different technology choices for roadside infrastructure, while they also processed and qualified differently the data that they received.

A number of associations took a user perspective. Two associations representing consumers noted that there was a lack of buy-in from citizens and that user needs were not being properly addressed, while also noting, as did another similar association, that a clear case of the benefits of C-ITS was not being made to potential users. Related to this, a city network noted that a business case and the business model were missing for urban areas. An association representing telecommunications interests also noted that a lack of public demand, due to a lack of familiarity with C-ITS and their advantages, should be considered to be a driver.

The financing and cost of C-ITS applications was noted by a number of associations. An association representing logistics interests believed that there was limited support from public investment, while another representing road operators argued that was no reliable launch strategies to justify pre-investment. An association representing digital interests felt that the financing models for the necessary infrastructure investment were unclear. An association representing transport companies felt that the costs in cities in particular was too high, while an association representing road operators believed that the same could be said more generally; both believed that the high costs were more problematic as a result of the limited benefits of C-ITS. The latter also noted that the interaction of C-ITS with existing processes and systems, including electronic toll collection, needed to be considered.

Other issues raised were a lack of clarity around insurance and liability (from a consumer group) and a lack of cooperation between actors (from an association of road operating companies). An association representing ITS interests took this argument further, arguing that competition law prevents the necessary cooperation between C-ITS manufacturers in the course of the development of C-ITS. An association representing public transport operators underlined that – in contrast to the current debate – public transport should be the backbone of any C-ITS deployment plan, as it should be implemented in a way that delivers wider transport policy targets, particularly in urban areas. Otherwise, the interest in C-ITS in urban areas will be limited. An association representing telecommunications providers, and a private company argued that the “uncertain minimum requirements for interoperability” was not a driver of a slow and fragmented C-ITS deployment, rather that a requirement to have mutual interoperability would risk slowing down C-ITS deployment. Consequently, any interoperability requirement should focus on applications.

Issues raised by private companies were similar to those mentioned by associations. Two vehicle rental services company argued that an inability to access in-vehicle data reduced their ability to improve their customers’ experience and to facilitate their use of the rental car. Another company noted that there was no regulatory framework to access connected car data for the aftermarket, and that the solutions being offered by manufacturers to address this did not allow fair and reasonable access. A supplier noted that fragmentation was not acceptable to industry, as it would increase costs and reduce the possibility of providing a good service to users in all Member States, while another noted that a lack of infrastructure enabled for C-ITS was an issue, together with the fact that infrastructure often used different technologies.

Public acceptance linked to the tangible benefits people can derive from C-ITS was considered an issue by a supplier. Another supplier was still not convinced of the need for C-ITS, while a telecommunications provider suggested that there were no clear benefits of C-ITS to road users.

Costs and finance were raised by a number of companies. A vehicle manufacturer noted that capital expenditure would be higher if two technologies – ITS G5/ DSRC and LTE V2 – were proposed to address the ‘incompatible communications technologies’ driver. Another manufacturer questioned how fast cities and municipalities would be able to install the technology needed in their infrastructure. One supplier noted the high cost of the roadside infrastructure that was needed, while another noted that it was mainly higher level authorities that had committed funds to C-ITS implementation to date. A consultancy stated that they did not agree with the premise of the question, as the high costs of some C-ITS solutions was a good reason not to use them. An ITS provider questioned the commitment and knowledge of public authorities. A lack of a business case for manufacturers, particularly in relation to
safety applications, was noted as a barrier by four suppliers, while two companies also noted that more consideration of the potential of smart phone-based applications would be useful, as demonstrated in the NordicWay project.

A supplier noted that there was an imbalance between the social benefits of C-ITS and commercial interest, adding that a standardised interface for back-end exchanges was also needed to ensure their compatibility. One company noted that other emerging mobility solutions, including e-mobility, should be considered in the development of the C-ITS policy framework in order to ensure a ‘future-proof’ C-ITS environment.

A couple of companies commented on the use of different frequency bands. A telecommunications provider noted that the ‘Ku’ band was used for providing connectivity to cars, as well as for many other applications. They wanted to ensure that all satellite applications were able to operate in the ‘Ku’ band (in particular the 14.0-14.5 GHz band) and to consider a license exemption and free circulation for satellite earth stations for connected cars in this band. There would then be a natural phase out of the remaining fixed service links in the 14.25-14.5 GHz band. A supplier argued that the deployment of C-ITS should not be jeopardised by harmful interference from other technologies and that technological neutrality cannot be an overriding concern if safety was put at risk.

Respondents from public authorities raised similar issues to other respondents. A repeated response from two authorities (and a citizen) was that existing transport laws and regulations in Member States were not open to the possibilities offered by C-ITS. Other issues raised included:

- a lack of transparency as to what C-ITS are being developed by manufacturers (four times),
- (uncertainty about) the cost of the infrastructure needed (three times), and
- a lack of clear strategies at the local level (three times).

The inability to generate the data needed at the local level, a lack of a coordinated concept for implementation between the various participants and a lack of information about C-ITS performance were all raised by a couple of public authorities. Other issues raised by a single authority were:

- a lack of a business model,
- the need to clarify liability issues in the event of a technical malfunction leading to an accident, and
- the poor quality of the user interface for existing applications.

A national ministry noted that there was a need for further research into how users responded to C-ITS when it was provided as an information service in order to understand its wider impacts. They also noted that it was still not clear whether and how the necessary investments in infrastructure would be made by public authorities.

A couple of respondents from public authorities commented on the ‘incompatible communication technologies’ driver. One noted that as long as the responsibility for generating and distributing safety-related C-ITS services lay with road authorities, the latter will decide which technology to use. Another noted that if the radio spectrum frequency used was in a different band, e.g. 800 MHz, the distances between base stations could be increased, thus reducing costs. In addition, two public authorities noted that the debate about different communication technology was inhibiting deployment.

Various missing drivers were proposed by NGO respondents. These included a lack of consensus amongst the various actors (infrastructure owners, vehicle manufacturers and telecommunications providers) about who will carry the costs, an unwillingness of individual manufacturers to share their data with each other, a lack of public acceptance as a result of a lack of trust and willingness to give control to others and a lack of awareness about C-ITS more generally. One NGO commented that there needed to be a clear interest in C-ITS from public authorities and that if C-ITS did not help authorities to meet their wider policy objectives, it would be difficult for them to justify spending the necessary money. In this respect, it was argued that Intelligent Speed Assistance should be a priority while the benefits and uses of smartphones should not be overlooked. It was also noted by one NGO respondent that the responses to the various questions about drivers was dependent on which C-ITS was being considered, as personal data was not a problem if a user was receiving data from roadside infrastructure.

The potential missing drivers mentioned by citizens included a lack of business cases and a lack of agreement amongst different stakeholders. One noted that testing was important to support the establishment of procedures and requirements for C-ITS more generally, while another argued that the
mainstream technological solution (i.e. 802.11p) was becoming obsolete as a result of the development of cellular technologies. Another noted that most Day 1 services were agnostic to the way data was received and processed and that they could be deployed with existing IP-based communication networks.

Responses from those categorising themselves as ‘Other’ noted the need for public transport to be explicitly taken into account in the deployment of C-ITS and the lack of a business case/model for C-ITS that addressed specific mobility problems that would bring benefits for all stakeholders involved. Another respondent listed issues that were important for road operators and road authorities, which included the ability of the sector to implement long-term plans, the correct assignment of frequencies to avoid interference with existing systems (e.g. toll systems), liability in the event of an accident and uncertainties relating to technology choice. Their concern with the latter was that the speed of the development of alternatives to the existing mainstream technologies might render the latter obsolete. Another respondent noted that the uncertainties with respect to data in general, and to vehicle data in particular, from road and traffic managers and operators, was an issue.

2.2.5 Q8. The Commission has established the following objectives for this initiative. From your point of view, how important is it to achieve these objectives? (n=133-136)

Table 2-2 below presents the objectives being considered for the initiative in terms of their importance of being achieved (Absolutely essential, very important, moderately important, of little importance, not at all important, no opinion/I don’t know).

<table>
<thead>
<tr>
<th>Objective No</th>
<th>Objectives considered for this initiative:</th>
<th>Shortened name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>8a</td>
<td>Ensure continuous availability of C-ITS services for users across the EU, by clearly defining a set of priority C-ITS services</td>
<td>‘Continuous availability’</td>
</tr>
<tr>
<td>8b</td>
<td>Ensure security of C-ITS communications by establishing common rules</td>
<td>‘Security’</td>
</tr>
<tr>
<td>8c</td>
<td>Ensure the practical application of Data Protection in the area of C-ITS</td>
<td>‘Data protection’</td>
</tr>
<tr>
<td>8d</td>
<td>Ensure a forward-looking hybrid communication approach (combining complementary communication technologies, e.g. WiFi and cellular)</td>
<td>‘Forward-looking coms’</td>
</tr>
<tr>
<td>8e</td>
<td>Ensure interoperability of C-ITS services by establishing common rules</td>
<td>‘Interoperability’</td>
</tr>
<tr>
<td>8f</td>
<td>Ensure seamless deployment of C-ITS service by establishing a compliance assessment framework (which allows services to be checked against EU-wide requirements)</td>
<td>‘Seamless deployment framework’</td>
</tr>
</tbody>
</table>

As shown in Figure 2-13, a large proportion of respondents stated that they felt all objectives were absolutely essential or very important – Ensuring ‘security’ (8b) and ‘interoperability’ (8e) were considered the most important (122 out of 136 (90%) and 116 out of 134 (87%) respectively). The least important objective considered was ensuring ‘forward-looking communications’ (8d) however 91 out of 133 (68%) respondents still indicated it absolutely essential or very important. The number of respondents who had no opinion/did not know was small except for ‘forward looking comms’ for which another 15 respondents (11%) stated this. The objectives ‘continuous availability’ (8a), ‘forward-looking coms’ (8d) and ‘seamless deployment framework’ (8f) received the least support in terms of little importance and not at all important responses, yet this number was very small (12, 12 and 10 out of 134,133 and 135 respectively).
When analysed by stakeholder groups, private company respondents in general indicated most support for objectives being achieved. For example, the most favoured objective of ensuring ‘security’ (8b) (see Figure 2-14) had 36 out of 39 respondents (92%) indicating it absolutely essential or very important. This was the case for all objectives except the least favoured ‘forward-looking comms’ (8d) for which the amount of association respondents indicating absolutely essential or very important was 2% higher. The stakeholder that had at least one negative (little/no importance) response for all objectives was public authorities.

When analysed by representing interest¹ clear consensus was seen with all drivers. For example, when looking at the most favoured objective in terms of ensuring interoperability of C-ITS services by
establishing common rules (8e) (Figure 2-15), at least 88% of respondents from all interest groups felt it moderately important or higher that this objective was achieved. Several respondents representing vehicle and equipment manufacturers/suppliers/repairs and societal/consumer rights (four out of 30 and three out of 11 respectively) felt the objective ‘forward-looking hybrid communication’ (8d) was of little importance or not important at all, along with several regional local public authorities (three out of 14) for the objective of ‘ensuring continuous availability’ (8a), however these amounts were not considered significant.

Figure 2-15: Response on the importance of the objective ‘Ensure interoperability of C-ITS services by establishing common rules (8e)’ in being achieved, by representing interest

![Graph showing response percentages for different interest groups](image-url)
2.2.6 Q9. Please elaborate on your answers to the previous question. Do you consider that any objectives are missing? (n=97)

Of the ninety seven respondents who elaborated on their response to question 8, 28 were from associations and 27 were from companies. A further twenty one responses were from representatives of public authorities, eight were from NGOs and five were from citizens, with the remaining eight coming from those who categorised themselves as ‘other’.

A number of respondents from associations made the case for additional legislative action. A repeated response from five associations representing distributors of replacement automotive parts and diagnostic tools (and one private company) called for C-ITS to be regarded as an integrated part of the vehicle, not as a separate IT element. Consequently, it was important that all of a vehicle’s hardware and software should be regulated and tested as one unit. Two associations (and a private company) concerned with vehicle inspection underlined the need for rules and transparent procedures to test the whole system for both type approval and roadworthiness testing. They also highlighted that the relevant transport infrastructure should be “consistently and permanently” operational.

An association representing garage equipment suppliers called for the interoperable requirements of a vehicle platform to be standardised through CEN and be part of vehicle type approval requirements. Two associations representing insurers provided similar responses calling for an additional objective to establish a legal framework to ensure in-vehicle access to vehicle data. They believed that this was needed to ensure that consumers were in control of who has access to their in-vehicle data, as well as to ensure that there was a level playing field for data-based service providers. An association representing consumers called for an enhancement of education and training practices for drivers and noted (along with a similar association) that it was important for the Commission to ensure that consumer rights were protected. However, they both argued that if industry did not see a business case for a particular C-ITS application the Commission should not intervene.

A number of respondents highlighted the importance of a hybrid approach to communication. An association representing vehicle manufacturers (and a manufacturer) believed that such an approach was essential and that the approach was being handled appropriately by the Commission. They also believed that common rules should not be established by regulation, but by the efforts of industry. Furthermore, they noted that due consideration needed to be given – e.g. in CEPT/ETSI – to ensuring that technologies such as LTE-V did not interfere in a harmful way with other technologies in the 5.9 GHz radio frequency spectrum. An association representing road operators underlined that their members needed to be able to procure C-ITS that functioned well using different communication technologies. Another similar association also supported a hybrid approach, but noted that this needed to be dynamic in order to take account of the different degrees of maturity of different technologies.

An association representing telecommunications interests also underlined the need for a hybrid approach to communications. Further, they noted that the standards and established working practices of the telecommunications industry relating to the ‘operational securitisation and efficient deployment’ should be taken as an important point of reference in this respect. They also underlined that the development of the compliance assessment framework should be integrated with the fulfilment of all of the other objectives. Another association representing telecommunications interests (and a similar response from a private company) believed that certain objectives set out in Annex II of the ITS Directive should be prioritised by the Commission. They noted that no technology should be seen to be the incumbent; instead the outcome that should be focused on was that which was cost-efficient. They believed that such an outcome would be delivered where both C-V2X and IEEE 802.11p co-existed in the 5.9 GHz radio spectrum frequency band. Another principle that they considered should be applied was proportionality, and so C-V2X should not be required to be interoperable and backwards compatible with IEEE 802.11p.

The importance of engaging and informing consumers was noted by a number of respondents. Two associations (and a private company) concerned with vehicle inspection underlined that consumers needed to understand the how data was used, and that the training and education of drivers was crucial as vehicles became more automated. They noted that work was ongoing in this area, which should not be duplicated, so reference should be made in the C-ITS policy framework to both the GDPR and the e-privacy Regulation. An association representing ITS interests and another representing consumers noted that data protection and interoperability were particularly important, although an association representing traders in automotive parts believed that the former was not very relevant for C-ITS.
There were a number of responses relating to infrastructure, and its financing. An association representing road surfacing interests noted that it was important to identify what infrastructure was needed for different applications and to decide who should be responsible for its provision and maintenance. An association representing consumers underlined that it was important to ensure that public authorities invested in infrastructure, while an association representing automotive suppliers underlined that it was important to ensure that public-private investments were made. An association representing the railway industry noted that C-ITS should include communications at the interface between road and railways, especially at level crossings.

An additional comment from a consumers’ organisation called for the ‘upgradability’ of the C-ITS components of vehicles to be mandatory, as the lifetime of cars is typically 10 years or more. Two associations representing transport operators underlined that they needed to ensure the continuity of their services, so that private technology providers must also be able to provide operators with a certain level of service, particularly if safety would otherwise be at risk. An association representing road operating companies called for the choice of the technologies to be deployed to be left to the market, while an association representing similar interests noted, in defining the appropriate roles and responsibility with respect to C-ITS, that the role of the concessionaire, as an active manager of the roads, should not be lost.

A number of respondents from private companies also called for the development of additional legislative action. A company responsible for repair and replacing vehicle parts called for a clear and fair legal framework to ensure that the aftermarket can access connected car data. The need for a binding legal framework to ensure access to in-vehicle data – in readable and interoperable format – to all market operators was also raised by a car rental company. A supplier noted that the approach taken to the C-ITS corridors was a good way of avoiding the ‘chicken-or-egg’ problem and that a mandate should be considered.

Several private companies also raised the debate between ITS G5 and LTE V2X. A supplier noted that clarifying the role of these two was important, as there should not be competing technologies from the first day. Another supplier was critical of the ‘push from the cellular industry’ to bring an unproven technology into the same radio spectrum frequency band in which stakeholders were deploying ITS-G5, and was concerned that this would affect the deployment of the latter and so not deliver its potential benefits. A vehicle manufacturer noted that feasibility tests needed to be undertaken of the potential of LTE V2X to co-exist in the 5.9 GHz frequency band, or for it be allocated a new frequency band in order to avoid interference with ITS G5. Another vehicle manufacturer called for the hybrid communication approach to allow for both Wi-Fi cellular and C-V2X cellular, while noting that interoperability between these was not possible. A third manufacturer called for ‘co-existence concepts’ for ITS-G5 and LTE-V to be developed. An ITS service provider noted that a hybrid communication approach was essential, particularly as it was hard to reconcile the ‘V2X aspect’ with GDPR and e-privacy. A telecommunications provider agreed with all of the objectives identified, but called for the Commission to recognisef communications as a necessary element when considering a hybrid communication approach.

A vehicle manufacturer noted that there was no level playing field between road authorities in terms of the technology that they were choosing and the way in which they processed and qualified the data that they received. A transport operator called for transport operators to be directly involved in defining the framework for C-ITS.

Proposals for additional potential objectives for the development of a policy framework on C-ITS included:

- Set technology neutral standards; build on existing standards; create a good balance between physical and digital infrastructure; and ensure redundancy when higher levels of automation are possible (from a vehicle supplier).
- Digitisation of road infrastructure (another supplier).
- Establish a clear common position on liability (for safety-related devices); and ensure that the initial benefits of C-ITS are focused on sustainable modes (a consultancy).
- Ensure affordability of C-ITS for end users; ensure that developments in connected vehicles lead to the development of autonomous vehicles; make the activation of C-ITS the default setting; and ensure a level playing field to avoid market dominance (with reference to C-V2X in particular) (another supplier).

Some respondents did not agree with the need for EU level action in all areas. A vehicle manufacturer argued that service harmonisation and hybrid communication were already being addressed so that
there was no need for legislation in these areas. An equipment supplier noted that, while standardisation was needed, it should be left to the market to decide which C-ITS services were important. A consultancy argued that the role of the EU should be on ensuring an equal level of protection for citizens, not on defining services or determining technical solutions. A vehicle supplier proposed that legislation was not able to develop fast enough, so industry self-certification based on a compliance framework was preferable.

From the perspective of public authority respondents, some objectives that were missing from the list provided in the online public consultation were:

- Provide clear guidance on the responsibility of public authorities when it comes to C-ITS service generation and C-ITS service provision.
- Create a governance structure for government-private consortia.
- Ensure that vehicle manufacturers deploy C-ITS technology.
- Increase public support through communication.
- Ensure cooperation from road authorities.
- Ensure that C-ITS services offer improved functionality that keeps increasing as the development of automatic driving progresses.

Another respondent noted that it was important to clarify the ownership rights of different types of data. A national authority noted that it was important to choose use cases that were adapted to particular networks or areas. A municipality noted that they needed long-term investment security, particularly in relation to the communications technology used, while another noted that investments in C-ITS were often difficult to justify politically as a result of a lack of a binding policy framework. A respondent underlined the importance of giving consideration to centralised communication, noting that many municipalities were already able to communicate directly with vehicle manufacturers.

A regional authority noted that insufficient attention was being paid to the need for barrier-free communication for drivers, while it was also important to communicate the ‘non-availability’ of content to remove the potential for adverse consequences as a result of this information being assumed to be available. Another noted that the challenge for implementation of C-ITS was to ensure that a service was available anytime, anywhere, which made it challenging from the perspective of the content of the services. While noting that the continuity of C-ITS should be guaranteed, a national ministry noted that there should be sufficient flexibility to allow the market to decide which services have the highest value to the end user. Another national ministry noted that, at this early point in the development of C-ITS, it was not necessary for the legislative framework to search for the perfect solution, as this risked slowing down development and deployment.

A national transport authority, while agreeing that all of the Commission’s stated objectives were relevant for C-ITS provided by public authorities, was not convinced that they all applied where such services were provided by commercial companies, as the latter would not be on the market long if they did not comply with some of the objectives. A national roads office argued that, while the compliance assessment framework should be set up in accordance with general legal requirements, the responsibility for undertaking the assessment should lie with industry, with public authorities intervening only if the legal requirements were not followed.

Several NGO respondents highlighted the way in which C-ITS needed to take account of, or even involve, cyclists and pedestrians. An NGO representing cyclists called for the European Statement of Principles on Human Machine Interface to be updated to take account of C-ITS. They also noted that driver training and education in relation to C-ITS was important, and that this should be mandated as part of the qualifications of professional drivers. They repeated a call made in response to an earlier question that the introduction of Intelligent Speed Assistance (ISA) in new vehicles should be prioritised, while noting that speed mapping should be coordinated to help make ISA a reality. They also argued that cellular technology made it easier to include pedestrians and cyclists, as did a group representing business. A consumer group argued that it was essential that C-ITS was only used to improve safety and driving efficiency, and never for other purposes.

More generally, a safety NGO noted that using cellular technologies was a potentially good means of delivering an early mass take-up of C-ITS services. They also called for a roll-out plan for C-ITS services, rather than trying to roll these out everywhere at the same time, with an initial focus on the strategic road network. A group representing road users called for a global agreement, rather than just an EU agreement, on the relevant requirements and rules.
A response from a citizen proposed that the focus of the initial deployment should be on the parts of cities and on the main corridors where it makes most sense to invest and that data would be best made available on telematics or smartphones using the best available data channel. Another noted that access to safety and traffic management-related data should be ensured, while a third underlined the need to ensure the acceptability of C-ITS by citizens. They noted that a targeted advertising campaign would be important in this respect, and that the Commission was an appropriate organisation to undertake such a campaign.

Responses from those who classified themselves as ‘Other’, generally explicitly supported the objectives stated in the online public consultation. One suggested that, while security, privacy and data protection were important, there was perhaps too much emphasis on these elements, while another noted that public awareness of data protection was only moderate. It was also noted that while continuous availability was important, it was not essential.

2.2.7 Q10. From your point of view, how important is it to achieve these objectives through action at the EU level (as opposed to action only at the national level or international standardisation)? (n=132-135)

Table 2-3 below presents the objectives being considered through action at the EU level, as opposed to action only at national level or international standardisation (Absolutely essential, very important, moderately important, of little importance, not at all important, no opinion/I don’t know).

Table 2-3: Objectives considered for Question 10

<table>
<thead>
<tr>
<th>Objective No</th>
<th>Objectives considered through action at EU level:</th>
<th>Shortened name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>10a</td>
<td>Ensure continuous availability of C-ITS services for users across the EU, by clearly defining a set of priority C-ITS services</td>
<td>‘Continuous availability’</td>
</tr>
<tr>
<td>10b</td>
<td>Ensure security of C-ITS communications by establishing common rules</td>
<td>‘Security’</td>
</tr>
<tr>
<td>10c</td>
<td>Ensure the practical application of Data Protection in the area of C-ITS</td>
<td>‘Data protection’</td>
</tr>
<tr>
<td>10d</td>
<td>Ensure a forward-looking hybrid communication approach (combining complementary communication technologies, e.g. WiFi and cellular)</td>
<td>‘Forward-looking comms’</td>
</tr>
<tr>
<td>10e</td>
<td>Ensure interoperability of C-ITS services by establishing common rules</td>
<td>‘Interoperability’</td>
</tr>
<tr>
<td>10f</td>
<td>Ensure seamless deployment of C-ITS service by establishing a compliance assessment framework (which allows services to be checked against EU-wide requirements)</td>
<td>‘Seamless deployment framework’</td>
</tr>
</tbody>
</table>

A large proportion of respondents (90-116 out of 132-135 (68-86%)) indicated that it was absolutely essential or very important for all objectives to be achieved at EU level as opposed to only at national level or international standardisation (see Figure 2-16). The objective ensuring interoperability (10e) had the most respondents who felt it absolutely essential (82 out of 134; 61%) compared to the objective ‘seamless deployment framework’ (10f) (where only 49 out of 133 (37%) stated this. The number of respondents who had no opinion/did not know was very small, except for the objective ‘forward-looking comms’ (10d) where 14 out of 132 (11%) stated this. The number of respondents who felt the objectives were of little importance or not important at all was also small (between four and 13 out of 132-135 (3-10%)).
When responses were analysed by stakeholder group, consensus between the stakeholders was identified in most areas. There was an approximately identical split within each stakeholder group when looking at the objectives ‘continuous availability’ (10a) ‘data protection’ (10b) ‘forward-looking comms’ (10d) and ‘interoperability’ (10e) (see Figure 2-17). For example, at least 74% of respondents felt it absolutely essential or very important to achieve the objective of ensuring interoperability at EU level. Citizen respondents felt all objectives were absolutely essential or very important (at least 63%) except for when considering the objective ‘seamless deployment framework’ (10f) for which only 27% did. A very small number of respondents across all stakeholders indicated the objectives were of little importance or not at all familiar (one-three), but this was not considered significant.

Figure 2-17: Response on the importance of the objective ‘Ensure interoperability of C-ITS services by establishing common rules’ (10e) being achieved at EU level (as opposed to action only at national level or international standardisation), by stakeholder group
When responses were analysed by representing interest, consensus was again seen in most areas. A large proportion of respondents from all interests felt the importance of objectives being achieved at EU level was either absolutely essential or very important. For example, when looking at the least favoured objective ‘Seamless deployment framework’ (10f), at least 50% of respondents from all interest groups stated this (aside from the unknown group). For the objective of ‘continuous availability’ however, the amount of respondents stating it absolutely essential varied, from 15 out of 30 (50%) from those representing vehicle and equipment manufacturers/suppliers/repairs and 11 out of 15 (73%) others, to only one out of seven (14%) ITS service providers. A small number of respondents across all interest groups except automotive replacement part associations indicated the objectives were of little importance or not at all familiar, but this was not considered significant (one-three).

Figure 2-18: Response on the importance of the objective ‘Ensure seamless deployment of C-ITS service by establishing a compliance assessment framework’ being achieved at EU level (as opposed to action only at national level or international standardisation), by representing interest.
2.2.8 Q11. Please elaborate on your answers to the previous question (n=78)

Of the seventy eight respondents who elaborated on their answers to Question 10, 26 were from associations and 23 were from private companies. Of the remainder, 15 were from public authorities, seven from NGOs and three from citizens, with four responses being provided by respondents that had categorised themselves as ‘other’.

When elaborating their responses to Question 10, many respondents from associations underlined the need for EU action on C-ITS generally. A repeated response from six associations representing distributors of replacement automotive parts and diagnostic tools (and one private company) argued that only an EU level approach would ensure that C-ITS operates in a fully effective and beneficial way. An association representing road surfacing interests underlined that EU action was necessary as a result of the need for all elements of C-ITS systems to be able to interact across modes and borders. Two associations (and a company) concerned with vehicle inspections argued for EU rules to promote a common European transport policy for automated and, in the future, autonomous vehicles and to provide legal certainty for drivers. An association representing vehicle manufacturers (and two manufacturers) stated that an EU framework was necessary to guarantee cross-border services. An association representing road operators supported EU action as municipal road operators needed a reliable, long-term basis in which to invest in C-ITS. General support for an EU level approach was also given by two associations representing traders of automotive parts, an association representing logistics interests and an association representing ITS interests.

Other respondents from associations underlined the need for EU action with respect to particular objectives. Two associations representing insurers provided similar responses arguing that security, data protection, ensuring a hybrid communication approach and interoperability of C-ITS services can only be regulated at EU level as a result of the cross-border nature of road traffic. An association representing the bicycle industry (and a private company) underlined the need for EU action to address interoperability and to ensure a hybrid approach to communications technology. An association representing public transport operators supported the need for EU action on data protection and security, but noted that in order to deliver the other objectives, close cooperation was needed between the EU and technology providers, manufacturers and end-users of the technology.

An association representing transport companies noted that it was important to develop different priority use cases for cities than for motorways, as the two environments were very different. An association representing railway interests reiterated a response to a previous question that C-ITS should include communications at the interface between roads and railways, especially at level crossings.

Some associations representing telecommunications interests were less supportive of EU action. One supported global action to address the stated objectives, as the automotive industry was a global industry. They further argued that cellular V2X was a ‘future proof’ technology that was developing rapidly and was readily adaptable to new use cases, which prevented it from becoming obsolete. Another argued that, while achieving continuous availability and security of C-ITS merited involvement by the EU institutions, it did not believe that such institutions should be involved in specifying technical solutions or in designating essential functional requirements, as these were better left to international standardisation processes. A third (along with a private company) argued that the proposed hybrid communication approach could not be considered to represent a ‘forward looking approach’, as a result of its technology coverage. Instead, they argued that interoperability of these should be left to the ongoing processes involving ETSI and CEPT to resolve any issues caused by the co-existence of different technologies in the ITS band of the radio frequency spectrum.

Many respondents from private companies were supportive of EU level action generally, or in specific areas. Two suppliers noted that fragmentation needed to be avoided in order to reduce costs and accelerate deployment. One of these also noted that this would help to increase customer acceptance while the other noted that the EU should provide a minimum set of services, as was being proposed in the US. The latter also reiterated their criticism of the cellular industry in trying to bring forward, what they considered to be an unproven technology, into the radio spectrum frequency band used by ITS safety applications. Another supplier underlined the need for backward compatibility with ITS-G5 and proposed that the EU cooperate with the US in this respect. An ITS service provider noted that EU action could ensure long-term viability and economies of scale, while a telecommunications provider noted that interoperability was important as national action would not address cross-border needs.

Ricardo in Confidence
A supplier expressed the hope that European standards could even be adopted internationally, while an ITS service provider noted that after harmonisation, uniformity was important for achieving a critical mass. In supporting the need for EU action to deliver the continuous availability of C-ITS for users across the EU, a telecommunications provider underlined the need to recognise the potential role of satellite communications technology in providing the necessary mix of communications technology.

A car rental company highlighted interoperability and security as the two most important elements of a common EU approach, while a supplier highlighted individual protection. A research network noted that the implementation of C-ITS should be seen as a step towards cooperative automated driving, which could be assisted through co-financing the implementation of C-ITS. Reiterating their responses to previous questions, a car rental company and a company involved in the repair and replacing of vehicle parts underlined the need for EU action to develop a binding legal framework to ensure fair and interoperable access to in-vehicle data for all market operators in order to protect consumer rights and to promote innovation.

Other private companies had some concerns. A vehicle manufacturer called for a technology neutral approach, including one that allowed direct communication via LTE-V or Wi-Fi. They noted that compatibility between C-V2X and Wi-Fi was technically not possible, but argued that it should be left to market forces to decide which technology was best. A telecommunications provider also argued for a technology neutral approach as technology was developing fast, so a too-detailed legislative framework risked locking-in outdated technology and thus risked not delivering the ambition of Europe to lead the world in this area.

Public authority respondents from municipalities who elaborated on their response to Question 10 were generally supportive of EU action, whereas respondents from Member State ministries were more cautious. One regional administration noted that technology was global, so national action would be insufficient, so EU action was better as global action was unlikely. A repeated response from two municipalities noted that EU action was needed to provide a long-term reliable foundation for investment, while another supported EU action to enforce the interoperability of technology. Another noted that EU action was needed as ITS did not stop at national borders. One municipality underlined that the EU should be seen as the platform, and not the authority, where all the national and regional knowledge comes together. Another noted that hybrid communication was perhaps a temporary necessity or compromise, as the future of communications technology was highly uncertain. One national authority noted that all of the proposed actions were needed to avoid fragmentation. Additionally, they suggested that experience with road tolling underlined that standards on their own were not sufficient; harmonised specifications were essential.

A response from a national authority suggested that the compliance assessment should focus on security and interoperability and noted that the definition of priority services was not synonymous with deploying these everywhere. A national ministry noted that there were still many uncertainties about the exact measures that needed to be undertaken, while another national ministry noted that the EU should be careful not to over-regulate at this stage. A national transport administration noted that any response to Question 10 depended on the services being considered and who was providing them.

NGO respondents who elaborated on their responses to Question 10 generally supported EU action, as otherwise C-ITS would not operate to its potential. One highlighted that EU action was better than national and international action, as the former would risk fragmentation and the latter would take too long. Another highlighted that the EU should not do research and development and not favour certain approaches over others.

One citizen who responded was not convinced of the need for the definition of a clearer set of priority services, arguing that this risked ignoring potential innovative services. They also underlined that common rules that bound-in a particular technology should be avoided, while supporting action on security, data protection and hybrid communication. Another citizen underlined that, even though some Member States were lagging behind others in terms of implementing C-ITS, these should not be allowed to impose less stringent standards, as this would risk undermining trust in C-ITS.

One of those respondents categorising themselves as ‘Other’ noted that many of the objectives were already being addressed at the EU level in the work of the C-ITS Platform and the C-Roads projects. Another warned against building a European policy framework using a top-down model, underlining that a bottom up approach was more important.
2.2.9 Q12. To achieve the above objectives, different types of action could be foreseen (n=123-133)

Q12.a. For the objective "Ensure continuous availability of C-ITS services for users across the EU, by clearly defining a set of priority C-ITS services", please rank the types of action from most appropriate (1) to least appropriate (3) to achieve the objective.

Figure 2-19 highlights that responses to the objective “ensure continuous availability of C-ITS services for users across the EU, by clearly defining a set of priority C-ITS services” were fairly mixed. However, the action of legally binding EU specifications on C-ITS had most support (55 out of 133 responses; 41%) compared to 43 out of 129 (33%) for soft legislation and 35 out of 126 (28%) for an industry-led approach. Even though soft legislation did not receive greatest support, it was the action that received the least number of least appropriate responses (18 out of 129; 14%). In comparison, the action of industry-led approach received the least support, with 59 out of 126 (47%) least appropriate responses.

Figure 2-19: Ranked response to the appropriate action for the objective “Ensure continuous availability of C-ITS services for users across the EU, by clearly defining a set of priority C-ITS services”

When responses were analysed by representing interest as shown in Table 2-4, respondents with interests in vehicle and equipment manufacturers/suppliers/repairs, regional or local public authorities, societal interests/consumer rights and automotive replacement part associations were mostly in favour of legally binding EU specifications (50%, 50%, 55% and 100% respectively). Respondents with interests in automotive replacement parts were strongly in favour of legally binding action. All other interests had respondents split more equally between the three actions.

Table 2-4: Number of first choice (rank 1) responses for the objective “Ensure continuous availability of C-ITS services for users across the EU, by clearly defining a set of priority C-ITS services”, by representing interest

<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Industry-led</th>
<th>Soft legislation</th>
<th>Legally binding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle and equipment manufacturers/suppliers/repairs</td>
<td>7</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Road/transport operators</td>
<td>4</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Regional or local public authorities</td>
<td>3</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>National Public Authorities</td>
<td>3</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Societal interests and/or consumer rights</td>
<td>3</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Research/Academia/Consultancies</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>ITS service providers</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Telecommunications providers</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Associations representing automotive replacement parts</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Road authorities</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Unknown</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Q12.b. For the objective "Ensure security of C-ITS communications by establishing common rules", please rank the types of action from most appropriate (1) to least appropriate (3) to achieve the objective.

Figure 2-20 shows that the action considered most appropriate for the objective “ensuring security of C-ITS communications by establishing common rules” was having legally binding specifications, where 76 out of 131 respondents (58%) stated this compared to 21-23% for other actions. Soft legislation was the next most supported action, with 84 out of 129 responses (65%) indicating it moderately appropriate. In comparison, industry-led approach received the least support, with 73 out of 123 respondents (59%) indicating it least appropriate.

When responses were analysed by representing interest, as shown in Table 2-5, respondents with interests in automotive replacement parts were strongly supportive of legally binding action, where as respondents with interests in ITS service providers were strongly supportive of either industry-led or soft legislation action (43% and 57% respectively). Respondents with research/academia/consultancy interests did not favour soft legislation action for this objective, whilst regional or local public authorities did favour industry-led action. Telecommunications provider and road authority interest had respondents split more equally between the actions.

Table 2-5: Number of first choice (rank 1) responses for the objective “Ensure security of C-ITS communications by establishing common rules”, by representing interest

<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Industry-led</th>
<th>Soft legislation</th>
<th>Legally binding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle and equipment manufacturers/suppliers/repairs</td>
<td>11</td>
<td>4</td>
<td>15</td>
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<tr>
<td>Road/transport operators</td>
<td>1</td>
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<td>9</td>
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<td>Regional or local public authorities</td>
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<td>National Public Authorities</td>
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<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Societal interests and/or consumer rights</td>
<td>1</td>
<td>4</td>
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<td>Research/Academia/Consultancies</td>
<td>3</td>
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<td>ITS service providers</td>
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<td>Telecommunications providers</td>
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<tr>
<td>Associations representing automotive replacement parts</td>
<td>0</td>
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<td>5</td>
</tr>
<tr>
<td>Road authorities</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Unknown</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Road user</td>
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</tbody>
</table>
Q12.c. For the objective "Ensure the practical application of Data Protection in the area of C-ITS", please rank the types of action from most appropriate (1) to least appropriate (3) to achieve the objective.

Figure 2-21 shows that, as in Q12, the most supported action for the objective “ensuring the practical application of Data Protection in the area of C-ITS” was having legally binding specifications, where 80 out of 131 respondents (61%) indicated it most appropriate compared to 14-26% for other actions. Soft legislation was the next most supported action, with 82 out of 129 responses (64%) indicating it moderately appropriate. In comparison, industry-led action received least support, with 86 out of 126 respondents (68%) stating it as least appropriate.

Figure 2-21: Ranked response to the most appropriate action for the objective “Ensure the practical application of Data Protection in the area of C-ITS”

When responses were analysed by representing interest\(^1\), as shown in Table 2-6, respondents representing interests in vehicle and equipment manufacturers/suppliers/repairs, road/transport operators, national public authorities and replacement part associations indicated that legally binding action was the most suited approach to this objective (70%, 67%, 64% and 80% respectively). Respondents with interests in societal/consumer rights and telecommunications and ITS service providers did not favour industry-led action, whilst remaining interests had a more equal split between the actions.

Table 2-6: Number of first choice (rank 1) responses for the objective “Ensure the practical application of Data Protection in the area of C-ITS”, by representing interest

<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Industry-led</th>
<th>Soft legislation</th>
<th>Legally binding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle and equipment manufacturers/suppliers/repairs</td>
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<td>National Public Authorities</td>
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<tr>
<td>Societal interests and/or consumer rights</td>
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<td>Research/Academia/Consultancies</td>
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<td>ITS service providers</td>
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<td>Telecommunications providers</td>
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</tr>
<tr>
<td>Associations representing automotive replacement parts</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Road authorities</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Road user</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
Q12.d. For the objective “Ensure a forward-looking hybrid communication approach”, please rank the types of action from most appropriate (1) to least appropriate (3) to achieve the objective.

Figure 2-22 highlights that responses to the objective “ensuring a forward-looking hybrid communication approach” were mixed. Industry-led action received the most support with 52 out of 123 (42%) most appropriate responses, however this also received 48 out of 123 responses (39%) for least appropriate. Soft legislation was the next most supported action, with 69 out of 126 responses (55%) indicating it moderately appropriate, and this also received the smallest number of least appropriate responses (17 out of 126; 13%). Legally binding specifications was thought to be least suited, with 61 out of 128 (48%) least appropriate responses.

Figure 2-22: Ranked response to the most appropriate action for the objective “Ensure a forward looking hybrid communication approach”

When analysed by representing interest¹, as shown in Table 2-7, all respondents with interests in ITS service providers felt industry-led action was the best approach. In comparison, all respondents representing interests in replacement parts felt legally binding action was the most appropriate. Respondents with interests in both road/transport operators and telecommunications providers did not favour legally binding action for this objective. The other interest groups had a more even split between the three actions.

Table 2-7: Number of first choice (rank 1) responses for the objective “Ensure a forward-looking hybrid communication approach”, by representing interest

<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Industry-led</th>
<th>Soft legislation</th>
<th>Legally binding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle and equipment manufacturers/suppliers/repairs</td>
<td>13</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Road/transport operators</td>
<td>7</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Regional or local public authorities</td>
<td>3</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>National Public Authorities</td>
<td>6</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Societal interests and/or consumer rights</td>
<td>5</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Research/Academia/Consultancies</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>ITS service providers</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Telecommunications providers</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Associations representing automotive replacement parts</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Road authorities</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Road user</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>
Q12.e. For the objective "Ensure interoperability of C-ITS services by establishing common rules", please rank the types of action from most appropriate (1) to least appropriate (3) to achieve the objective.

Figure 2-23 highlights that views were mixed, but the action considered most appropriate for the objective "ensuring interoperability of C-ITS services by establishing common rules" was having legally binding specifications, where 66 out of 130 respondents (51%) indicated it most appropriate compared to 21-31% for other actions. However, this action also received 51 out of 130 least appropriate responses also (39%). Soft legislation was the next most supported action, with 73 out of 125 responses (58%) indicating it moderately appropriate. Industry-led action received least support, with 64 out of 125 respondents (51%) stating it as least appropriate.

**Figure 2-23: Ranked response to the most appropriate action for the objective “Ensure interoperability of C-ITS services by establishing common rules”**

When analysed by representing interest¹, as shown in Table 2-8, respondents with interests in national public authorities, research/academia/consultancy, automotive replacement parts, and other felt legally binding action was the most appropriate (64%, 78%, 100% and 62% respectively). In comparison, all respondents with interests in telecommunications or ITS service providers felt that legally binding action was less appropriate. Additionally, all respondents with interests in regional or local public authorities felt that industry-led action was the least appropriate method. Other interest groups had a more even split across the three actions.

**Table 2-8: Number of first choice (rank 1) responses for the objective “Ensure interoperability of C-ITS services by establishing common rules”, by representing interest**

<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Industry-led</th>
<th>Soft legislation</th>
<th>Legally binding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle and equipment manufacturers/suppliers/repairs</td>
<td>7</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Road/transport operators</td>
<td>2</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Regional or local public authorities</td>
<td>0</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>National Public Authorities</td>
<td>2</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Societal interests and/or consumer rights</td>
<td>5</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Research/Academia/Consultancies</td>
<td>2</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>ITS service providers</td>
<td>1</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Telecommunications providers</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Associations representing automotive replacement parts</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Road authorities</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Unknown</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Road user</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

Ricardo in Confidence
Q12.f. For the objective “Ensure seamless deployment of C-ITS service by establishing a compliance assessment framework (which allows services to be checked against EU-wide requirements)”, please rank the types of action from most appropriate (1) to least appropriate (3) to achieve the objective.

Figure 2-24 shows that views were mixed. The action considered most appropriate for the objective “ensuring seamless deployment of C-ITS service by establishing a compliance assessment framework” was having legally binding specifications, where 56 out of 131 respondents (43%) indicated it most appropriate. However, this was closely followed by soft legislation action with 50 out of 126 respondents (40%). In fact, this action also received 64 out of 126 moderately appropriate responses (51%) and the smallest number of least appropriate responses (12 out of 126; 10%) (compared to legally binding action with 50 out of 131 (38%) least appropriate responses). In comparison, industry-led action received the least support, with 68 out of 126 (54%) least appropriate responses.

Figure 2-24: Ranked response to the most appropriate action for the objective “Ensure seamless deployment of C-ITS service by establishing a compliance assessment framework (which allows services to be checked against EU-wide requirements)”

When analysed by representing interest¹, as shown in Table 2-9, respondents representing interests in societal/consumer rights, research/academia/consultancies, automotive replacement parts and other felt that legally binding action was the most appropriate for this objective (55%, 67%, 100% and 58% respectively). In comparison, respondents with interests in road/transport operators and national public authorities stated that soft legislation was the most appropriate (64% and 57% respectively). Other interest groups had a more even split across the three actions.

Table 2-9: Number of first choice (rank 1) responses for the objective “Ensure seamless deployment of C-ITS service by establishing a compliance assessment framework”, by representing interest

<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Industry-led</th>
<th>Soft legislation</th>
<th>Legally binding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle and equipment manufacturers/suppliers/repairs</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Road/transport operators</td>
<td>2</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Regional or local public authorities</td>
<td>1</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>National Public Authorities</td>
<td>2</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Societal interests and/or consumer rights</td>
<td>3</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Research/Academia/Consultancies</td>
<td>2</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>ITS service providers</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Telecommunications providers</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Associations representing automotive replacement parts</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Road authorities</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Unknown</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Road user</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
2.2.10 Q13. Please elaborate on your answers to the previous question. In particular, if you favour EU action, please indicate what this needs to cover and what form it should take. Please also indicate if you think other (types of) action(s) should be considered to achieve the objectives (n=96)

Ninety six respondents elaborated on their responses to Question 12. Twenty nine of these were from associations, twenty eight from companies, twenty one from public authorities, eight from NGOs and six from citizens. The remaining five came from those who categorised themselves as ‘other’.

When elaborating on their answers to Question 12, a number of respondents from associations simply underlined or reiterated their support for EU action for various reasons. Two associations representing automotive importers and traders suggested that the market would not deliver the specified goals, so binding specifications were needed. A consumers’ organisation argued that binding EU rules were the only way of creating EU-wide legal certainty and clarity, while a similar association argued that binding rules were necessary in some cases as a result of the difficulty in reaching an agreement with all of the industry stakeholders involved. An association representing road operators, as well as three public authorities, noted that, while legally binding rules should govern data protection, IT security and interoperability, soft controls may also support these. An association representing road surfacing interests supported the conclusions of the C-ITS Platform report that there was a need for an appropriate EU framework, noting in particular that there was a need to identify the roles of entities at the EU level that would be responsible for supporting the deployment of C-ITS and to define the necessary financing schemes.

On the other hand, an association representing vehicle manufacturers (along with two manufacturers) believed that an industry-led approach was sufficient for delivering most of the priorities and indeed that it was already doing so, although they noted that due consideration needed to be given to issues around the allocation of the radio frequency spectrum. An association representing the bicycle industry also noted that industry would be able to deliver services and interoperability, although the EU could support this by developing guidelines or specifications, and by addressing data and consumer protection. An association representing transport operators argued that an industry-led approach should be preferred where this was sufficient, although an EU framework for data privacy, data protection and security would be useful. They also noted that where the GDPR provides to be insufficient, soft legislation could be used to fill the gaps. The latter point was also made by an association representing public transport operators, with an additional point that fully anonymised data should always be preferred to pseudo-anonymised data. They also explicitly noted that the continuous availability of the system must at least be guided by recommendations at the EU level. A city network supported EU action on security, product safety and data, but argued that it should be left to road authorities to select the C-ITS services that were most appropriate for its needs, particularly as most Day 1 services had been designed for motorways and so were less relevant to cities.

An association representing road operating companies argued that if EU rules focusing on safety could be laid down, their implementation should be left to the market. Two associations representing consumers provided a similar response noting that a market-driven approach for the deployment of C-ITS was appropriate, with the Commission providing guidance or legislation to ensure data protection and the security of communication.

Associations representing telecommunications interests raised a number of issues. One noted that the mobile telecommunications industry was experienced in providing secure products and services to their customers, and that their industry has already delivered security guidelines and tools that covered connected cars, which it provided with its response (See Section 3). They also noted that while privacy and trust were important for the consumer adoption of C-ITS, these should be addressed in the context of the GDPR, an issue on which they sought legal certainty and clarity. Another telecommunications association (and a private company) noted that EU action should focus on providing clarity on security and data protection and that it should build on existing and ongoing standardisation processes, while ensuring technology neutrality and stimulating innovation and ‘market-based technology choices’. It also noted that it provided evidence (Section 3) of the benefits associated with co-existence of different technologies in the 5.9 GHz band of the radio frequency spectrum.
An association representing road operators recognised the importance of having a common system within the context of a general EU framework, but called for a legally binding approach to be avoided. They made reference to the Directive on electronic tolling in this respect arguing that a binding approach risked limiting the development of the market and the applicability of systems in all Member States.

Several respondents from associations reiterated their responses to previous questions about the need for additional EU legislative action. A repeated response from six associations representing distributors of replacement automotive parts and diagnostic tools (and one private company) argued that market forces would not allow the full benefits of C-ITS to be achieved. In order to enable this, an EU level legislative framework was needed ‘that covers the standardised vehicle technical specification/functions to provide access to the vehicle, its data and resources, together with the ability to safely and securely exchange data with the vehicle’. They argued that this should include vehicle type approval, as well as safety and security guidelines. An association representing cyclists called for C-ITS to be incorporated into EU Regulations on general vehicle safety.

Two associations representing insurers provided similar responses calling for EU rules to ensure in-vehicle access to vehicle data, either through an on-board application platform, or an in-vehicle interface, otherwise consumers would not have access to the full range of services and service providers. Two associations (and a private company) concerned with vehicle inspections called for the revision of Directive 2014/45/EU on the periodic inspection of vehicles to include ‘IT security’ and ‘data protection’, which should include a functionality test. They also argued that there was a need to clarify type-approval requirements in order to ensure that the mode of action and operation of ‘safety-related and environment-related systems and components’, as well as the integrity of the vehicle software, were documented in the course of vehicle type-approval. Finally, they urged policy makers to ensure that C-ITS was able to demonstrate that it can co-exist with the adjacent 5.8 GHz radio frequency spectrum band that facilitates electronic road user charging.

Most of the respondents from private companies who elaborated on their responses to Question 12 provided a reason why they supported EU action. Reasons provided by individual suppliers for binding EU action included that this would help: to ensure that costs remained at acceptable levels; to facilitate adoption; to provide legal certainty; to enable uninterrupted cross-border travel; to ensure that the benefits of safer roads were delivered; and because otherwise industry would not introduce road safety applications. A transport operator commented that EU action made sense to support new technical systems and replace outdated rules in Member States, while a company working in ITS noted that EU action was necessary in order to ensure that C-ITS served a public purpose. While supporting EU action, a supplier noted that EU action should take account of the maturity of the technologies concerned and the deployment of the necessary infrastructure, while another commented that EU action should focus on consumer protection and ensuring compliance with common rules that enhance competitiveness between companies. A telecommunications company was more supportive of soft EU action.

In their responses, some private companies highlighted the role for industry in the context of EU action. A supplier noted that the ITS Directive had not significantly increased deployment of ITS, so that more dedicated EU action was needed to ensure that C-ITS were deployed. However, they highlighted that EU action should still provide industry with the room to innovate, although this should not involve self-regulation. Another supplier made a similar point that EU action should not prohibit the deployment of C-ITS, while a research network underlined that it should be industry that developed C-ITS. An ITS service provider was favourable of EU action, but noted that this should be supported or even led by industry, while a similar company supported EU action on data protection and compliance assessment, but suggested that in other areas an industry-led approach was favourable to enable innovation.

A supplier preferred that industry be allowed to self-certify, while a vehicle manufacturer preferred ‘soft certification’ with respect to data protection. The manufacturer also believed that it was not necessary to re-open the discussion about the hybrid communication approach at this point in order to avoid potential issues with interoperability and backwards compatibility, although they noted that additional standards might be necessary to handle any future ‘multi-channel configuration’. Another supplier felt that EU action was necessary in order to overcome the commercial interests of the more powerful players, but noted that soft EU regulation would be more preferable as strict regulation might hinder innovation.

A telecommunications provider was less convinced that EU action on C-ITS was necessary, noting that in the Nordic countries cellular communication was the superior option. They argued that EU action could help to support the development of cellular coverage across the EU, with a focus on roads.
consultancy argued that governments in general should not introduce legislation that seeks to direct technology or service solutions.

A car rental company and a company involved in the repair and replacing of vehicle parts reiterated their response to earlier questions by calling for EU action to develop a binding legal framework to ensure fair and interoperable access to in-vehicle data for all market operators in order to protect consumer rights and to promote innovation.

Various reasons, and caveats, were provided by public authorities that supported EU action. Public authorities that supported EU action across the board argued that: without binding EU action unified deployment would not be possible; otherwise implementation would be slow; and in order to ensure that C-ITS were deployed. Two public authorities provided a caveat to their support of EU action to underline that the relevant industries should be involved in the process. Two public authorities were more selective, with one highlighting that EU action was essential for data protection, IT security and interoperability, with the other highlighting the need for EU action on compliance assessment, principles for the C-ITS data value chain, communications standards and the selection of a small number of priority services and actions.

A number of public authorities focused on the boundaries between binding legislation and softer action. One noted that whatever was needed to ensure that the technology that was procured was interoperable should be subject to binding legislation, whereas a softer approach for the generation of C-ITS services would be more appropriate. A similar response highlighted that binding action was important where security, privacy, data protection and conformity were important, but that industry should play a leading role in the provision of services. A national ministry noted that EU regulation should be preferred to ensure interoperability and to protect rights, whereas industry should be referred to in relation to the provision of technical standards. A national roads office noted that legal binding legislation should not be too detailed.

A number of national ministries were more cautious. One noted that the softest possible solution was currently the best, and that it was not yet clear where there was a need for further regulation. Another national ministry noted the importance of standardisation at the EU level, but preferred these to be of a ‘non-binding and advisory character’. A third argued that for policy areas such as C-ITS, where industry had a very important role, a consensual approach forward was more appropriate, supported by memoranda of agreement.

A provincial authority was less convinced of the need for EU action, suggesting that Europe should instead be the platform where discussions are held and agreements are reached. A national transport administration noted that, from their perspective, their main concern was with the issues that were of their concern, e.g. roadworks and emergency vehicles, whereas other C-ITS should be left to manufacturers.

The NGO respondents who elaborated their response to the previous question generally provided reasons for their support of EU action. These included: to ensure interoperability; to protect users; and to avoid the abuse of loopholes in softer action. One NGO respondent noted that the binding rules should not be restrictive, while another noted that it was industry’s role to develop new services. An NGO focused on the protection of consumer rights additionally called on EU action to set a detailed timetable for the introduction of safety-related C-ITS services and a clear set of targets for implementation. They also proposed the creation of a new platform that brought together all relevant public and private stakeholders in order to facilitate the swift updating of the relevant legislation. One NGO representing cyclists commented that the question was badly worded, as Member States were also able to regulate and that not all C-ITS required regulation. Reiterating a response to a previous question, they noted that Intelligent Speed Assistance (ISA) should be included within EU type approval.

Responses from citizens varied. One noted that binding rules were important to ensure that action was taken, while another stated that binding EU action, at least in the early stages of deployment, was necessary to avoid fragmentation and a decline in safety and functionality. On the other hand, another citizen preferred a softer approach, as they considered that it was difficult to legislate in areas involving innovative technologies. One citizen noted that implementation was dependent on the communication technologies that were used, and this was where industry was in the driving seat. The importance of the market and the behavioural response of users was raised by one citizen, who noted that it was appropriate for industry to lead in most of the proposed areas.

As with citizens, responses from those who categorised themselves as ‘Other’ varied. One noted that EU intervention was needed in relation to the security of C-ITS communications, but the remaining
objectives should be achieved through a harmonious combination of EU and industry action. Another response supported regulation to ensure the continuous availability, interoperability and seamless deployment of C-ITS services, but preferred that the hybrid communications approach be negotiated with industry. With respect to security and data protection, they noted that generic EU legislation was already in place, while it was proving difficult to introduce binding legislation for technology that was relevant to C-ITS, which was still developing. Consequently, they were concerned that binding legislation in these areas would prove to be a barrier for development and deployment. Other responses underlined that a clear definition of services was necessary, and that the approach to delivering a hybrid communications approach should be technology-neutral and based on a memorandum of understanding with industry, which could be a prerequisite for the allocation of the appropriate bands of the radio frequency spectrum.

2.2.11 Q14. Please indicate if you agree with the following statements on accelerating deployment of C-ITS (when services are fully functional and EU-wide specifications are in place) (n=131-132)

Table 2-10 below presents the statements being considered in terms of accelerating deployment of C-ITS.

<table>
<thead>
<tr>
<th>Statement No</th>
<th>Statements considered for accelerating deployment of C-ITS:</th>
<th>Shortened name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>14a</td>
<td>Enabling conditions such as exchange of best practice and funding instruments are sufficient, thus there should be no mandatory deployment of C-ITS.</td>
<td>‘No mandatory deployment’</td>
</tr>
<tr>
<td>14b</td>
<td>C-ITS equipment should be mandated in new vehicles</td>
<td>‘Mandated in new vehicles’</td>
</tr>
<tr>
<td>14c</td>
<td>Retrofitting C-ITS equipment in existing vehicles should receive financial support</td>
<td>‘Retrofitting financial support’</td>
</tr>
<tr>
<td>14d</td>
<td>C-ITS roadside equipment should be mandated on core interurban transport routes (i.e. those in the core trans-European network (TEN-T))</td>
<td>‘Mandated on core routes’</td>
</tr>
<tr>
<td>14e</td>
<td>C-ITS roadside equipment should be mandated on all main interurban transport routes (i.e. those in the comprehensive trans-European network (TEN-T))</td>
<td>‘Mandated on main routes’</td>
</tr>
<tr>
<td>14f</td>
<td>C-ITS roadside equipment should be mandated on all main interurban transport routes AND urban nodes (i.e. those in the comprehensive trans-European network (TEN-T))</td>
<td>‘Mandated on main + nodes’</td>
</tr>
</tbody>
</table>

Figure 2-25 shows that response on the agreement of each statement in terms of accelerating deployment of C-ITS was slightly mixed. A moderate proportion of respondents (60-84 out of 131-132 (45-64%)) indicated they strongly agreed or agreed with all statements, apart from ‘no mandatory deployment (14a) where only 40 out of 132 (30%) did. The most supported statement was C-ITS equipment to be ‘mandated in new vehicles’ (14b). For ‘no mandatory deployment’, a large number of respondents (68 out of 132; 51%) disagreed or strongly disagreed. In comparison, the number of respondents for all other statements was between 25 and 39 (19-30%). The number of the respondents who both neither agreed nor disagreed or had no opinion/did not know was small (19-28 (14-21%) and three-10 (2-8%) respectively).
When responses were analysed by stakeholder group, consensus between the stakeholders was identified in most areas. There was an approximately identical split within each stakeholder group when looking at objectives: ‘retrofitting financial support’ (14c), ‘mandated on core routes’ (14d), ‘mandated on main routes’ (14e) and ‘mandated on main + nodes’ (14f). For example, for all stakeholders that responded to the objective ‘mandated on main routes’ (14e), between 46-54% agreed or strongly agreed with the statement (except Other – 20%). Within these four objectives, public authorities tended to have the largest proportion of respondents disagreeing/strongly disagreeing (between seven and 13 out of 31). For the least favoured ‘no mandatory deployment’ statement (14a), it was association respondents that had the largest number of respondents disagreeing/strongly disagreeing (20 out of 35; 57%) (see Figure 2-26). No citizen respondents across all statements had no opinion/did not know compared to between one to four out of 35 associations.
Figure 2-26: Response on the level of agreement of statement ‘Enabling conditions such as exchange of best practice and funding instruments are sufficient, thus there should be no mandatory deployment of C-ITS’ (14a), by stakeholder group

When analysing by representing interest¹, consensus was seen for some objectives over others. For ‘no mandatory deployment’ (14a), ‘mandated in new vehicles’ (14b), and ‘retrofitting financial support’ (14c) there was a fairly even distribution between each of the representing interest groups. For example, for the most favoured objective of mandating in new vehicles (14b), at least 50% of respondents from all interest groups stated they strongly agreed or agreed with this (except ITS service providers (29%) and the single road user response) (see Figure 2-27). In comparison, for objectives ‘mandated on core routes’ (14d), ‘mandated on main roads’ (14e) and ‘mandated on main + nodes’ (14f), responses varied widely across the different interest groups. For example, when looking at the objective of mandating on core routes (14d), 73% of respondents representing interests in vehicle and equipment manufacturing/suppliers/repairs strongly agreed or agreed, compared to just 13% of road/transport operators.
2.2.12 Q15. Please elaborate on your answers to the previous question (n=98)

Ninety eight respondents elaborated on their answers to Question 14, of which 28 came from associations and 27 were from companies. The remaining responses included 24 from public authorities, eight from NGOs, five from citizens and six from respondents who classified themselves as ‘other’.

Several respondents from associations that supported some form of mandate explained their responses. Two associations representing insurers highlighted the need for mandatory action to deploy C-ITS infrastructure on the most important inter-urban routes as these were of most importance to the transport of people and goods in Europe, while an association representing automotive importers noted that mandates were important wherever there was significant traffic. An association representing road surfacing interests supported mandates on core corridors as they believed that this was an opportunity
to develop C-ITS solutions. A repeated response from six associations representing distributors of replacement automotive parts and diagnostic tools (and one private company) supported mandates, noting that every non-connected vehicle risked adversely affecting the efficiency of the whole network. An association representing the bicycle industry noted that mandating C-ITS was a good way of improving the level of service experienced by road users, while another representing traders of automotive parts noted that mandates were a good means of ensuring the quick deployment of C-ITS. A consumer organisation supported mandates on interurban routes and the consideration of vehicle retrofit, arguing that the benefits to the consumer must be the first consideration.

Two associations (and a company) involved in vehicle inspection noted that it was important for the Commission to establish a clear timetable for the implementation of C-ITS, with a focus on ensuring that C-ITS services that improve safety were mandatory. They noted that retrofitting older vehicles should be considered if it proved to be cost-effective. An association representing telecommunications interests noted that a mandate would help speed up effective deployment, but called for a distinction to be made between ‘roadside equipment’ and ‘C-ITS equipment’ in order to better distinguish the responsibilities of different industries.

An association representing vehicle manufacturers (as well as two manufacturers) supported infrastructure mandates as they would accelerate the acceptance and use of C-ITS applications that were being provided in vehicles. An association representing road operators (along with three cities) supported mandates for vehicles and on urban nodes, as long as the latter was accompanied by the necessary funds. A network of ITS interests supported mandates, but was not convinced that retrofitting vehicles was technically feasible. An association representing logistics interests supported mandates on vehicles and inter-urban routes, but not yet the other proposals, as a step-wise approach was best.

Rather than agreeing or disagreeing with most options, an association representing transport operators made a general point that urban areas should be more involved in the development of the policy framework for C-ITS, whilst ensuring that local freedom of action was maintained.

On the other hand, a city network stated that generally mandating the deployment of technology should be avoided, as the reason to mandate C-ITS over many ITS, for example, was not clear. They underlined that mandates for roadside infrastructure were only workable if accompanied by the necessary finances. An association representing public transport operators noted that mandating retrofitting should only be considered where it was technically feasible at a low cost, or was heavily subsidised, while mandating roadside equipment should only be considered if it were prioritised on the number of people transported. Two associations representing road users provided a similar response that they favoured a market-based approach for the development of C-ITS, supported, if at all, with funding. An association representing transport companies made a similar point that if there was no obvious need for cities to introduce C-ITS and no justification for a mandate.

An association representing infrastructure operators noted that road operators will implement C-ITS where it is beneficial, while mandating a particular communications technology that may be superseded did not make sense. An association representing telecommunications interests implied that a mandatory approach would be neither technology-neutral nor promote effective competition. Another telecommunications association (and a private company) referred to a study that concluded that the most benefit from C-ITS deployment came from scenarios where there was no mandate requiring the implementation of roadside units set up to use the 5.9 GHz radio frequency spectrum band.

As with responses from associations, many respondents from private companies elaborated on their reasons for supporting some kind of mandate, while a few explained why they were not supportive of any type of mandate. Two suppliers supported all of the options presented in Question 14 with one noting that a minimum set of C-ITS services should be mandated to ensure that a minimum set of C-ITS were deployed, while the other noted that it was important to consider the maturity of a technology before mandating its deployment. An ITS equipment and service provider noted that a mandate should not be geographically restricted. Three suppliers supported all of the proposed mandates, but did not support retrofitting even though two of these noted that retrofitting might be important in the longer-term. One justified this on the basis of providing a clear political signal, while another supported mandates only in situations where there were clear road safety benefits. One supplier and an ITS service provider supported mandating C-ITS in vehicles and on inter-urban infrastructure in order to ensure that C-ITS was implemented and that it delivered wider societal benefits.

Another ITS service provider supported mandatory action on infrastructure, as mobility was a cross-border activity; a supplier reached a similar conclusion as greater advances were currently being made...
in deploying C-ITS on vehicles than in infrastructure. Two vehicle manufacturers also supported mandates for infrastructure, but not vehicles, as the latter were already being implemented and that a good road network coverage was important for enabling many Day 1 services.

Two telecommunications providers only supported mandates for the deployment of C-ITS in vehicles and for financial support to be given for retrofitting old vehicles, as did a supplier and another company working in the repair and replacement of vehicle parts. One of the former noted that it was in vehicles where the challenge currently was, while the other argued that this was important to gain consumers’ trust. The repair company commented that only such an approach would ensure consistency across the market and bring C-ITS to consumers. A similar argument was made by the supplier, i.e. that the consistent use of C-ITS technology was needed by as many stakeholders as possible in order to attain a critical mass in the Member States. A supplier supported retrofitting connected cars with safety-enhancing cheap features, such as the ‘sharing of anonymised friction information’.

Five private companies elaborated on why they were not in favour of any mandated deployment of C-ITS. A transport operator argued that the focus of C-ITS should be on improving public transport by means of assistance for drivers in order to improve the attractiveness of public transport. A telecommunications provider argued that mandating a network of roadside infrastructure based on old technology would be costly, proposing instead that the focus should be on gaining maximum advantage from the use of cellular networks. An ITS service provider also questioned whether C-ITS based on roadside equipment was the best way forward given advances in other technologies. A consulting company was not convinced that there was clear evidence of the benefits from the large scale deployment of C-ITS and so concluded that it was inappropriate to mandate C-ITS at this stage. Another consultancy argued that transport agencies in many countries were trying to remove sensors from their roads, as these were difficult to install and costly to maintain, so additional (C-ITS) infrastructure should not be mandated on roads.

Of the public authority respondents, two regional governments and one national ministry elaborated on their support for all the options proposed in Question 14. One of the former noted that this should be undertaken at the latest when road maintenance was planned, while the other argued that without mandating C-ITS in vehicles the investment in infrastructure being made by cities would not be justifiable. The national ministry commented that without a mandate, it would be difficult to achieve the necessary economies of scale. A regional authority and a national ministry supported most of the Options proposed in Question 14, other than a mandate involving urban nodes. The former argued that a mandate would ensure that C-ITS was deployed and that it would make the responsibilities clear, although they believed it would be difficult to mandate deployment near cities. The national ministry called for the installation of roadside equipment as long as this was justified on the basis of a cost-benefit analysis. Two city authorities (and a citizen) also supported mandates, other than for cities, arguing that C-ITS had to be proven in the relatively simple case of inter-urban routes before being used in the more complex environment of cities.

Two authorities supporting all of the options proposed by Question 14, other than retrofitting. Both felt that these were important to ensure that C-ITS was implemented in a reasonable timeframe, with one noting that it would help to overcome the ‘chicken-or-the-egg’ problem. Additionally the latter suggested that, if vehicles were retrofitted with C-ITS, it would make the vehicle non-compliant with type approval legislation. A national roads administration supported mandates for C-ITS in vehicles and on the main interurban routes, but was not in favour of retrofitting as this risked leading to unexpected malfunctions.

A city and a regional authority only supported mandates for infrastructure, with one arguing that spending more money on cars may not be desirable if a city wants to focus more on bicycles, pedestrians and public transport. The other noted that there was a need for cooperation between national and the market with respect to the deployment of C-ITS, with the former needing to invest heavily in roadside infrastructure.

One national and two regional authorities supported mandates for vehicles and support for retrofitting, but not mandates for infrastructure. The former noted that installing roadside infrastructure everywhere would be costly and that public authorities were ahead of vehicle manufacturers in terms of deployment, so that it was more appropriate to mandate C-ITS deployment in vehicles. One of the regional authorities was also concerned about the cost of mandating roadside equipment, while the other noted that C-ITS that promotes road safety should be mandated. Two national road administrations only supported mandating C-ITS in vehicles. One noted that they were already equipping their roads with the necessary C-ITS infrastructure, while the other noted that implementation should be allowed to
respond to regional needs, and so there should be a general requirement to have sufficient communication coverage for C-ITS applications rather than a mandate.

A national roads authority did not support mandates, questioning whether this was a viable path to the widespread deployment of C-ITS. A national ministry was also not in favour of any sort of mandate as it considered that there was already a sufficient amount of incentives in support of the development of connected vehicles. Furthermore, they suggested that if the use of cellular technology was extended, the coverage of C-ITS on the road network could be increased in a much more efficient manner. Another ministry chose not to answer Question 14, as the direction of technological development was not yet clear, nor were the wider impacts of C-ITS deployment.

Three of the NGO respondents elaborated on their reasons for supporting all of the options listed in Question 14, which included that otherwise deployment would take longer and thus the subsequent benefits would be delayed. Another NGO supported all mandates, but not retrofitting, as it considered that this would be too costly. Instead, it suggested that 'retrofitting' might be achieved through services on a smart phone. With respect to infrastructure, they considered that the use of cellular systems would not entail much in terms of additional cost, although gaps in coverage, e.g. in tunnels, would need to be addressed. An NGO representing cyclists noted that some C-ITS should be mandatory in vehicles, such as Intelligent Speed Assistance, while support should be given for retrofitting where this would bring safety benefits. An NGO representing road users did not support any type of mandate arguing that making C-ITS mandatory in new vehicles would infringe on the rights of individuals, while mandating C-ITS on infrastructure would breach the principle of subsidiarity.

Two citizens that elaborated on their responses to Question 14 supported most of the options of Question 14, one was supportive of only selected options, while two were not in favour of any mandate. The former underlined that they were supportive as long as the security of the system was assured. The citizen that only supported a mandate on interurban routes argued that it was easier to impose something on a limited length of road in the first instance, which could then act as a spur to action on other roads. One of the citizens who opposed any form of mandate argued that mandating deployment of roadside C-ITS infrastructure may not be the most economical solution, while retrofitting risked low quality solutions that could put the future development of C-ITS at risk. Additionally, they pointed out, as did the other citizen who opposed mandates, that collaboration with the telecommunications industry might be a better and cheaper way of ensuring a wide coverage of C-ITS on the road network.

Of those respondents that categorised themselves as ‘Other’, two supported a mandate for C-ITS in vehicles and the retrofitting of existing vehicles. One of these argued that deployment of C-ITS roadside infrastructure would follow if vehicles were equipped with C-ITS, while the other noted that roadside equipment should only be installed if there was a need to improve road safety or to manage traffic better. Another, which only supported retrofitting, argued that there was a need to involve urban areas more in the discussions on C-ITS, including public transport operators. At the same time, they noted that it was important to respect subsidiarity and ensure local freedom of action in the implementation of C-ITS, which should be supported financially as it would benefit all road users. Another respondent, which also supported retrofitting, noted that C-ITS should be used to prioritise public transport and promote modal shift. Another respondent, while not in favour of any mandate, noted that regulating C-ITS on vehicles and on infrastructure might be beneficial, but that the latter in particular would not be easily achievable. If infrastructure were to be regulated, they preferred a requirement that a specific part of the network be covered by C-ITS communications, rather than mandating roadside equipment.

2.2.13 Q16. From your point of view, are there actions missing that should be considered at the EU level? (n=85)

Eighty five respondents answered the question about missing actions that might be considered at the EU level. Twenty eight of these came from associations, while 23 came from private companies. Sixteen public authorities also provided a response, as did seven NGOs, six citizens and five from those who categorised themselves as ‘other’.

The most common theme raised by associations was to do with access to, and the handling of, data. In many cases, these reiterated comments made in response to earlier questions. A repeated response from seven associations representing distributors of replacement automotive parts and diagnostic tools (and one private company) argued for a regulatory framework to ‘implement a standardised solution that considers the widest benefits of exchanging in-vehicle data (beyond just C-ITS)’ in order to enable
innovation and the development of competing services. Additionally, the same set of associations noted there needed to be a process to ensure that software in both infrastructure and vehicles was updated regularly.

Two associations representing insurers also provided a similar response that EU action on in-vehicle access to vehicle data was needed. Similarly, three similar responses from two associations and one company involved in motor vehicle inspection noted that an agreement needed to be reached on access to data, while also noting that recommendations should be made for the appropriate design of the human-machine interface for C-ITS. A consumers’ organisation underlined the need for regulation to address the handling of non-personal data.

A number of associations raised the need for additional financial actions. An association representing vehicle manufacturers (along with three manufacturers) proposed that incentives be provided for fitting C-ITS to new vehicles, and potentially for retro-fitting older vehicles. An association representing infrastructure operators called for financial support for the implementation of the various types of infrastructure needed for C-ITS, while an association representing suppliers called for action to ensure that public-private investments were made available to support the first phase of C-ITS deployment.

A couple of associations highlighted the need for more information. An association representing transport operators (as well as similar responses from three city authorities) called for support for authorities in the form of a comprehensive range of information, including training, as well as more opportunities for municipalities to participate in the development of standards and of the implementation process. A logistics association called for information campaigns and awareness raising.

An association representing telecommunications interests underlined the need to recognise the role of telecommunications infrastructure as a part of C-ITS, which would include the provision of a regulatory means to enable network resources to be shared to speed up deployment and ensure that competitive integrated solutions could be offered. Other suggestions for action to support the deployment of C-ITS included some sort of forum in which problems could be analysed and countermeasures identified (from a network of those with an interest in ITS) and action to contribute to the global harmonisation of C-ITS services and systems (from an association representing digital interests). An association representing telecommunications interests (and a similar response from a company) noted that whatever policy framework was proposed, it should be sufficiently flexible to allow technologies and solutions to adapt to developments in technologies.

A number of associations made more general comments in relation to actions that were missing. Two representing public transport operators provided similar responses that noted that one aspect that was missing from the consultation was the possibility of using C-ITS to grant priority to public transport, and to collective and shared transport, more generally. They argued that if one of the aims of C-ITS was to improve the efficiency of road use, it should be centred on public, not private, transport. Two similar responses from consumer organisations proposed setting up a test market (rather than operational tests) to identify the impacts of C-ITS in the real-world before it was implemented more widely. A city network proposed that rather than legislate to accelerate deployment, more funding for C-ITS should be provided through programmes, such as Horizon 2020 and CIVITAS. An association representing cyclists called for more action to deliver safety benefits, including the introduction of virtual number plates for cars, as well as future-proofing C-ITS modules that are fitted to cars.

Several respondents from private companies mentioned additional EU actions that might be considered. A supplier suggested that road weather information would be important in determining road weather conditions for highly automated driving, so this needed EU-wide standardisation, including a minimum network density and ensuring that the public can access the relevant data in real-time. A company involved in repair and replacement of vehicle parts underlined the need for an EU regulatory framework to govern access to in-vehicle data for the aftermarket.

An ITS service provider called for more awareness actions targeting end users, while a supplier called for more intensive and structured discussions at the EU level to avoid the risk of Europe falling behind other parts of the world. A research network proposed that a forum be set up in which the different views could be aligned and the different interests balanced in order to synchronise the further development of C-ITS. A consultancy called for the evidence of the ongoing trials, and the analysis of the outcomes, to be brought together.

A number of companies raised the issues of technology. While a supplier called for a conclusion to the debate about the use of the 5.9 GHz radio frequency spectrum band, as this was deterring investment, other companies proposed shifting the focus on other technologies. An ITS service provider proposed
that the current approach be ‘pivoted’ towards a data-driven approach using data from inter alia vehicle sensors and smartphones, while a similar company called for a cloud-based platform to complement road-side and in-vehicle equipment. A telecommunications provider called for a focus on a cloud- and smartphone-based solution making use of existing data. A consultancy argued that the focus of EU action should be on ensuring that communications-based systems and services can be operated safely and legally, rather than on defining these services and systems.

Additional actions mentioned by companies included: organise a C-ITS maturity model for Member States with a mandatory minimum level of implementation (from a telecommunications provider); and to ‘freeze’ the ITS standard, at least for the transmission layers (a supplier). Another supplier underlined that C-ITS are not the sole measure to improve road safety and mobility, and so should be balanced by measures to deliver clean mobility and further behavioural change in the transport sector.

From the perspective of public authorities, one municipality called for more coordination between different authorities, more finance to support tests, more communication to the public and public authorities, as well as more monitoring of technical developments and barriers to implementation. Similar themes were taken up by other respondents. Two city authorities (repeated by a citizen) suggested that it would be beneficial to promote one-off measures to test and raise awareness of C-ITS on urban nodes, while other city authorities mentioned more money for urban infrastructure and the need for more comprehensive information to communities and cities.

A national authority called for the development of a clear strategy for the provision of C-ITS services and public responsibility in line with the EU’s Digital Agenda. They argued that this was needed as there were many views in the EU as to where responsibility lay for different elements of C-ITS. A regional authority called for liability issues to be resolved.

A national ministry called for an evaluation of the readiness of different Member States to deploy C-ITS, as it noted that implementing C-ITS was not one of its top priorities. A regional authority noted that there should be more action on C-ITS for public transport with the aim of limiting private car use. A national ministry proposed that, after the adoption of the anticipated Delegated Act on C-ITS, the Commission produced a proposal to make the application of C-ITS mandatory in the way that has been done with eCall under the ITS Directive.

Some of the NGO respondents raised wider issues in response to the question about the EU action that was missing. While one called for an agreement on the priority services, another called for more active Commission involvement in information campaigns targeting the general public in order to address the many myths that surround ITS more generally. An NGO representing cyclists called for the inclusion of cycling and walking in the process of harmonising and standardising ITS and C-ITS in order that these modes were not left behind and instead seen as part of smarter transport technologies and services. It was noted that both electric-assisted bicycles and public bike share systems are becoming more advanced and will become more important as ‘mobility as a service’ develops. Another NGO representing road users noted that the EU’s legal framework needed to consider the interaction of connected and non-connected vehicles. Another NGO underlined that any future transport system involving C-ITS should take account of the needs of those with disabilities and should not discriminate against these groups.

Citizens raised some similar additional actions to those already mentioned by other stakeholders. These included that: access to data needed to be agreed upon; that there needed to be adequate publicity given to the various ongoing actions; and that a commission of independent experts should be set up to identify any faults in C-ITS equipment before it is put on the market. A citizen called for the centralisation of the decision making process in order to avoid long discussions between all national representatives. Another noted that the radio spectrum frequency band used by light rail had not been mentioned and wondered whether trams would be integrated into C-ITS.

One response from those who categorised themselves as ‘Other’ was that awareness raising and training targeting end users was important, while another commented that the EU should take more action to promote ‘mobility as a service’ projects that were closely related to C-ITS technology. Another noted that there was a need for research and practice on the business side, not just on the technology side. This needed to focus on the real problems of end users and on designing business models to address these needs. A respondent also called for the work on digital information to be intensified and extended, as harmonised traffic rules will be needed to implement Day 2 services.

Ricardo in Confidence
2.3 Impacts

The next seven questions of the PC looks at the impacts of C-ITS. Within this, the Commission has made a preliminary assessment of the most relevant impacts of substantial deployment of C-ITS (assuming that C-ITS equipment will be progressively deployed up to 2030 to eventually cover all new vehicles types/segments, all highways of the TEN-T core network and select other roads and urban nodes) which are presented in Question 17.

2.3.1 Q17: Please indicate your level of agreement with the following statements (n=134-136)

Table 2-11 below presents the most relevant impacts of substantial deployment of C-ITS.

<table>
<thead>
<tr>
<th>Statement No</th>
<th>Potential impacts of substantial deployment of C-ITS:</th>
<th>Shortened name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>17a</td>
<td>Investment costs for in-vehicle C-ITS equipment will be very substantial (i.e. the major part of overall costs)</td>
<td>'In-vehicle investment costs'</td>
</tr>
<tr>
<td>17b</td>
<td>Investment costs for roadside C-ITS equipment will be substantial (but a minor part of overall costs)</td>
<td>'Roadside investment costs'</td>
</tr>
<tr>
<td>17c</td>
<td>Investment costs for central C-ITS equipment (e.g. integration to national traffic management centres, software development) will form a small part of overall costs.</td>
<td>'Small central investment costs'</td>
</tr>
<tr>
<td>17d</td>
<td>The deployment of C-ITS will make a strong contribution to improving road safety</td>
<td>'Improved road safety'</td>
</tr>
<tr>
<td>17e</td>
<td>The deployment of C-ITS will make a strong contribution to reducing congestion</td>
<td>'Reduced congestion'</td>
</tr>
<tr>
<td>17f</td>
<td>The deployment of C-ITS will make a significant contribution to more efficient use of road infrastructure</td>
<td>'Efficient road infrastructure use'</td>
</tr>
<tr>
<td>17g</td>
<td>The deployment of C-ITS will deliver a small reduction in the expenditure needed for road infrastructure (both expansion and maintenance)</td>
<td>'Decreased infrastructure spend'</td>
</tr>
<tr>
<td>17h</td>
<td>The deployment of C-ITS will make a small contribution to reducing pollutant and CO2 emissions</td>
<td>'Reduced pollutant and CO2 emissions'</td>
</tr>
<tr>
<td>17i</td>
<td>The deployment of C-ITS will have a positive impact on international competitiveness of EU companies</td>
<td>'International competitiveness'</td>
</tr>
<tr>
<td>17j</td>
<td>The deployment of C-ITS will have a positive impact on research and innovation</td>
<td>'Research and innovation'</td>
</tr>
<tr>
<td>17k</td>
<td>The deployment of C-ITS will support bringing new services and products to the market and thus creating new jobs</td>
<td>'New services/jobs'</td>
</tr>
</tbody>
</table>

Figure 2-28 shows that response on the agreement of each impact from substantial deployment of C-ITS was mixed. For statements ‘improved road safety’ (17d), ‘efficient road infrastructure use’ (17f), ‘research and innovation’ (17i) and ‘new services/jobs’ (17k), a large number of respondents (105-113 out of 135-136 (77-84%)) stated they agreed. In comparison, for ‘in-vehicle investment costs’ (17a) and ‘decreased infrastructure spend’ (17g) only 37 and 44 out of 135 and 134 (27 and 33% respectively) agreed. ‘Decreased infrastructure spend’ was in fact split equally between agree, disagree and no opinion/did not know. ‘In-vehicle investment costs’ received the largest number of respondents who disagreed (65 out of 135; 48%), compared to ‘research and innovation’ (17i) and ‘new services/jobs’ (17k) with minimal responses (4%). The number of no opinion responses was fairly evenly distributed across all statements (besides 17g).
When responses were analysed by stakeholder group, consensus between the stakeholders was identified in most areas. There was an approximately identical split within each stakeholder group when looking at statements ‘improved road safety’ (17d), ‘reduced congestion’ (17e), ‘efficient road infrastructure use’ (17f), ‘international competitiveness’ (17i), ‘research and innovation’ (17j) and ‘new services/jobs’ (17k). For example, between 70-90% of respondents across all stakeholders agreed with the most favoured impact ‘improved road safety’ (see Figure 2-29). Private companies, associations, public authorities and other stakeholders had the largest proportion of respondents disagreeing (for example, for ‘small central investment costs’ (17c) 31-50% of respondents from these stakeholders disagreed, compared to only 18% of citizen respondents). Citizen, NGO and other stakeholders were most likely to have no respondents disagreeing.
2.3.2 Q18. Please elaborate on your answers to the previous question (n=88)

Eighty eight respondents elaborated on their answer to Question 17, of which there were 28 each from associations and private companies. A further 20 responses came from representatives of public authorities, five from NGOs, three from citizens and four from those who classified themselves as ‘other’.

Responses from associations that elaborated on their answers to Question 17 ranged from those that simply explained the reason for their response to those that were more critical or sceptical. An association representing the bicycle industry (and a similar response from a company) expected C-ITS to strongly improve travel efficiency and safety, with subsequent benefits for emissions. They also expected benefits in terms of increased transparency in terms of modal choice and pricing, which would enable bicycles, including e-bikes, to become part of an interconnected transport network. An association of automotive traders commented that similar vehicles in a standardised environment would improve traffic flow.

Some respondents commented on the type of impacts mentioned in the parts of Question 17. A vehicle manufacturers’ association (and similar responses from two manufacturers) believed that the impacts of C-ITS on reducing CO2 and air pollutants would be substantial, not small, as had been indicated by an ERTICO study on the decarbonisation benefits of C-ITS. They also believed that there would be substantial benefits for safety. A network of ITS interests also believed that C-ITS would have a large impact on pollution and infrastructure expenditure.

A city network did not expect C-ITS to improve road safety and traffic efficiency in urban areas, with the exception of lorries and fleets, but noted that it had the potential to play a supporting role in traffic management. A logistics association was not convinced that C-ITS would have a real impact on congestion, as there would also need to be a reduction in the number of vehicles, for example, to achieve this. They were also concerned that the investment costs of roadside equipment might be higher than expected if this was undertaken in an uncoordinated manner. A network of ITS interests noted that, in order to take full advantage of C-ITS, traffic management centres and data clouds would be needed, while the cost associated with in-vehicle equipment will be high simply as a result of the number of vehicles involved. They also noted that while accidents should decline, any advantages in terms of capacity and emissions may be negated by increased traffic volumes.

An association of transport operators (and similar responses from three cities) expected a positive contribution from C-ITS to road safety, but thought that the impacts on efficiency were likely to be low in the beginning. However, they noted the positive benefit for the economy, as a result of the introduction of modern infrastructure. They also noted that it was important to challenge the belief that there would be low costs for the central equipment needed for C-ITS, as these would need a lot of adaptation.
The implications on various costs were the primary concern of a number associations. Two associations representing transport operators provided similar responses. They noted that while the costs per bus would be small, the investment costs for roadside equipment for the entire bus fleet would be substantial, which raised the question of who would pay for this. They also noted that C-ITS would only contribute to reduced congestion if combined with other measures, including a real urban and land use planning strategy, to ensure that there were not more private cars on the road. In this respect, they argued that C-ITS should be used as a catalyst to encourage shared mobility. An association representing road operators said that, while C-ITS would bring benefits in terms of safety and the optimisation of infrastructure, it was ‘illusory’ to believe that the investment costs for the implementation of C-ITS would be low. Two similar responses from consumer associations believed that costs for vehicles (as a result of the numbers involved), roadside infrastructure and the central management of C-ITS would be significant, while they were not convinced of the benefits for road traffic safety.

An association representing telecommunications providers noted that it had chosen to disagree with all of the statements in Question 17, as they often contained many premises, not all of which they agreed with.

Two associations (and a company) representing those involved with vehicle testing noted the wider environmental benefits of C-ITS, including noise. A consumers’ organisation noted that the impacts on road safety and emissions would only occur if the deployment of C-ITS was widespread and if older vehicles were retrofitted. An association of telecommunications providers noted that the impacts would be affected by the significant lead time to the widespread adoption of C-ITS, as a result of the time needed to renew the vehicle fleet, and only if users accepted the technology. An association representing those that trade in automotive parts underlined the need for a legal framework to standardise C-ITS if the impacts were to be realised. An association representing telecommunications providers (and a similar response from a company) noted the significant potential for job creation underlined the potential safety benefits of C-ITS, but noted that achieving this was dependent on the technology used referring to a study carried out for 5GAA on this topic.

Two associations representing insurers provided a similar response re-iterating their points made in response to previous questions that the full benefits of C-ITS would only be achieved if there was a legislative framework at the EU level ‘to promote fair and equal in-vehicle access to vehicle data for all service providers’. A repeated response from six associations representing distributors of replacement automotive parts and diagnostic tools (and one private company) underlined the need for an interoperable telematics platform that supported C-ITS in order to ensure that competing services could be developed. An association representing cyclists noted that making sure that C-ITS hardware was able to be used for many different C-ITS services would increase their use.

Responses from private companies ranged from those that explained their answers to those that believed that achieving the impacts were conditional on other actions. In addition to reducing emissions, an ITS service provider saw C-ITS as an enabler for higher levels of automation, while a supplier saw digitalisation as an essential element of a low emission transport system with new mobility services. A vehicle manufacturer noted that communicated information would contribute to Advance Driver-Assistance Systems, which would have CO₂ benefits. Another manufacturer made a similar point, also noting that the CO₂ benefits would be maintained as a result of traffic optimisation. One supplier underlined the potential safety benefits of C-ITS, while another suggested that the benefits in terms of efficiency and environmental impacts might be larger than implied by the respective statements.

As with associations, the main concern of a number of private company respondents were the costs. Three suppliers noted that the costs of the installation of roadside units would be much higher than those associated with the car. One subsequently argued that the former should be prioritised, while another noted that this could be offset by encouraging high value C-ITS applications, such as freight signal priority. An ITS research network noted that there were potential benefits from C-ITS, but noted that additional investment in traffic management centres would be important to realise these.

A number of companies made reference to cellular technology as a means of reducing the costs of infrastructure. A vehicle manufacturer noted that using cellular technology, as has been implemented in vehicles for e-Call, would not require a major investment in either vehicles or infrastructure. A telecommunications provider noted that many of the proposed C-ITS services could be implemented using existing cellular technology, which would not require significant investment. A consultancy argued that cellular-based solutions would require limited investment in vehicles and in infrastructure (although they argued that there was no evidence of the benefits of C-ITS on safety and emissions). Another consultancy, while suggesting that the statements in Question 17 were poorly thought through, also
noted that the costs of infrastructure would be less using a cellular network. An ITS provider argued that a focus on equipment and physical aspects was too limiting; instead it should be more on the data and associated software.

A telecommunications provider was more cautious noting that it would take years to deliver even a 50% penetration of C-ITS, so the benefits of C-ITS would appear very slowly. A supplier noted that C-ITS would not necessarily lead to a reduced number of cars, but noted that there were other means of achieving this. A car rental company and a company involved in the repair and replacing of vehicle parts reiterated that it was important to ensure that all market operators were able to access the relevant in-vehicle data in a readable and interoperable format if the benefits of C-ITS were to be delivered.

Some respondents representing public authorities also provided reasons to support their conclusions, while others were more cautious. A national ministry noted that C-ITS would reduce the direct and indirect costs of transport and would enable the better use of infrastructure, although they noted that achieving economies of scale was important to reduce the costs of the equipment. Another national ministry called for European funds to support the implementation of C-ITS, while a regional authority noted that, in addition to CO2 benefits, C-ITS would allow information to be used more efficiently and thus jobs could be created.

A regional authority noted that C-ITS was a prerequisite for reliable automated and networked driving in the future, which would bring safety benefits, although they were not convinced that C-ITS would make a significant contribution to peak hour traffic, as it was space that was lacking in this case. A regional authority noted that the benefits for safety would only be felt over time, and suggested that in the transition phase there may be negative impacts, e.g. as a result of pilots. Another regional authority also noted that the economic benefits of C-ITS would only occur once there was a certain level of penetration. A national authority noted that it was not clear where the roadside equipment was needed, and that the extent of the eventual coverage would have impacts on the costs of both roadside infrastructure and the central C-ITS equipment.

A municipality noted that some jobs would be created, while others would disappear. In the long-term, they suggested that a beneficial impact would be greater social inclusion, as C-ITS would facilitate the use of collective and public transport. A national ministry noted that their responses to Question 17 were only a rough estimate. They noted that the costs of in-vehicle and roadside C-ITS equipment could be substantial in an absolute sense, rather than only relatively as implied by the question. They noted that while positive impacts have been suggested by pilots, these were on limited areas, so the overall impact was still too uncertain to undertake substantial investment and to justify legal obligations. Another national ministry noted that the impacts would depend on the implementation model, suggesting that if an approach was imposed at this stage, it may deliver little in the way of benefits at a significant cost.

A national roads office argued that the cost of installing C-ITS equipment in vehicles would be substantial as a result of the need for the constant updating of these systems, while large investments would be needed for backend infrastructure. They also noted that C-ITS would only reduce congestion and CO2 emissions if they were accompanied by other measures to ensure that excessive levels of traffic were not subsequently generated. A similar response from two city authorities (and a citizen) made a similar point that more efficient traffic would contribute to increased individual motorised transport, which would negate the benefits of C-ITS.

A regional authority noted that C-ITS alone would not deliver the benefits, as other mobility measures would also have to be implemented. Another regional authority made a similar point, that while technology would contribute a little to reducing congestion, behavioural change was more important. A national ministry believed that investment in central C-ITS equipment would account for a large part of the costs of deploying C-ITS, while they were not convinced of the benefits in terms of reduced congestion and lower road infrastructure costs.

An NGO representing road users underlined that the effects of the deployment of C-ITS would depend on the reaction of the public. They noted that while enlarging road capacity initially eases congestion, congestion soon returns, and they were concerned that there would be a similar impact from C-ITS deployment. A consumer group noted that costs could be reduced if cellular technologies were used and that C-ITS would only make a strong contribution to road safety if the right services were deployed and mandated. They also noted that while the need to maintain C-ITS equipment would increase the need for expenditure on road infrastructure, if its use was more efficient, less expansion of the network might be needed, which would reduce expenditure.
A response from a citizen underlined the need for the use of C-ITS to be monitored to ensure that it did not endanger other users. Another citizen noted that C-ITS would clearly bring benefits for road safety as 90% of accidents involved a human factor. With respect to costs, they noted that these were uncertain, but did underline that for C-ITS to function properly more investment was needed in traffic management centres. They also noted that the impact on congestion relied on the sufficient penetration of vehicles equipped with C-ITS.

One of the respondents who classified themselves as ‘Other’ noted that they assumed that there would be benefits from a significant level of deployment of C-ITS on safety and congestion, but did not have the evidence to support this. Another respondent believed that there would undoubtedly be benefits for traffic management and the efficient use of infrastructure from the deployment of C-ITS, as long as there were sufficient communication capabilities. They did not believe that the costs of maintaining infrastructure would decrease, as the introduction of C-ITS would increase the complexity of infrastructure. Similarly, they did not believe that C-ITS would reduce the costs of constructing new infrastructure, although they noted that better performing infrastructure might delay the need for new construction. They also noted that C-ITS would create new kinds of jobs, but also that jobs would be lost as a result of automation. Another respondent noted the importance of considering lifetime maintenance costs, in addition to investment costs.

2.3.3 Q19. From your point of view, are there any missing impacts that should be considered? (n=71)

Seventy one respondents commented on whether any impacts were missing from those listed in the online public consultation. Nineteen responses came from both associations and private companies, with a further 18 responses from public authorities. Of the remainder, five came from NGOs, four from citizens and six from those who classified themselves as ‘other’.

Suggestions from associations of impacts that might be missing included the impact on the safety of ‘road agents’ and the impact of radio-frequency emissions, which was mentioned by an association representing vehicle manufacturers (and two manufacturers). An association representing telecommunications interests encouraged the consideration of the impacts of C-ITS on telecommunications providers, and also suggested that other environmental impacts, such as land use and pollution, as well as the wider economic dimension might be considered.

An association representing transport operators noted that the impact of C-ITS on the share of public transport was missing, while two similar associations noted that the impact on shared mobility was not considered. In both cases, this was linked to the lack of a relevant objective for C-ITS in relation to public/shared transport. Another association representing road transport operators (along with similar responses from three cities) noted that C-ITS should not just aim to reduce emissions from individual vehicles, but in sensitive areas, such as in urban environments, which could be achieved by appropriate routing and other interventions in the course of a vehicle’s journey.

It was also suggested, by a city network, that C-ITS has a positive role to play in enforcing traffic rules, including access restrictions and parking management. Two organisations representing consumers underlined the importance of consumer acceptance of C-ITS and suggested that many consumers would expect that the hidden purpose of C-ITS was for it to be used for surveillance. A network of ITS interests underlined that C-ITS enables technology that can be used for networking and automating mobility. An association representing telecommunications interests (and a company) highlighted the importance of viable public-private partnerships in order to make the deployment of connected vehicle technology an appealing investment for authorities and for industry.

The importance of improving the safety and management of level crossings, where roads and railways meet, was highlighted by an association of transport operators. They noted that the rail sector had developed technologies to improve safety at level crossings, which should be taken into account in further consideration of how the data could be used for the benefit of citizens and road users. They were generally in favour of a greater exchange of information between the road and rail sectors to better manage disturbances and generally improve safety using real time and predictive train crossing information.

Responses from private companies mentioned some other impacts that might be missing from the list presented in the online public consultation. An ITS service provider noted that the wider economic value of C-ITS and wider quality of life impacts were not mentioned. A supplier wanted the anticipated positive
impact on vulnerable users to be emphasised more, as well as the impact on long haul goods transport. A vehicle manufacturer underlined that the coexistence of different communication technologies that were able to use the 5.9 GHz band of the radio frequency spectrum was important.

An ITS research network noted that the potential benefits of C-ITS would be felt in other sectors, as transport drives digitalisation and automation. An ITS service provider proposed that the benefits for the EU’s Digital Single Market could be incorporated, while also noting that the division of roles between the public and private sector could be given greater consideration. A telecommunications provider suggested that an impact might be increased costs for users, if insurance premiums were to increase as a result of the new C-ITS systems being fitted to cars, which could act as a barrier to adoption.

Some responses from companies were of a more general nature, or were more closely related to impacts that had been listed in Question 17. A consultancy that was sceptical of the need for EU action, proposed that the effort spent on developing the proposed policy framework for C-ITS would be better spent on promoting work on international standards. A supplier noted that it was still not clear who would pay for which parts of the necessary C-ITS system. A consultancy noted that C-ITS could have a beneficial impact on the costs and effectiveness of traffic management, while a telecommunications provider noted that the impacts on congestion and CO2 emissions were likely to vary between countries. A car rental company and a company involved in the repair and replacing of vehicle parts reiterated the importance of a binding legal framework to guarantee the right to fair access to in-vehicle data for all market operators, including the aftermarket.

In response to the question about impacts that were missing from those listed in Question 17, respondents from **public authorities** listed various impacts, while some raised issues that they felt had been neglected and others provided general comments. Missing impacts that were proposed by different authorities included:

- Impact on the role and structure of road operators.
- Costs associated with replacing roadside equipment with information transmitted directly to vehicles.
- Social inclusion, as sparsely populated areas would be able to be served by automatic transport systems.

A regional authority noted that, while the impact of C-ITS on traffic flow was marginal, such services should raise consumers’ awareness about the physical infrastructure, which should help to deliver better driving behaviour. Another authority raised a number of issues that they considered were in need of additional consideration including: audit and approval procedures for infrastructure; a legal framework to prevent the transmission of inaccurate or misleading information from infrastructure; and the way in which the information was communicated to the driver. A city authority noted that warning drivers about the presence of potentially vulnerable road users was possible, while another city authority underlined the need to provide more information on C-ITS to road users.

Two city authority authorities (and a citizen) underlined the importance of the intermodal benefits of C-ITS, with the implication that this was not currently recognised. A regional authority noted that currently the need for safe driving distances was a barrier to the more efficient use of capacity, but that C-ITS would not address this problem unless there were obligations on the market to fit C-ITS in cars. Another regional authority highlighted that C-ITS had the potential to increase mobility, so that behavioural change was needed to prevent congestion. A national authority noted that C-ITS was an essential step towards automation.

A national ministry listed a number of issues that it felt were missing from the debate, including the development of automated driving, ‘mobility as a service’, the use of retrofit systems on existing vehicles, the involvement of vulnerable road users and developments in the telecommunications market. Similarly, a national roads office listed: the costs and principles covering the operation, maintenance and updating of new services; principles for backward compatibility; and lifetime issues, including the total costs and benefits, as well as the risks associated with hardware failure.

An **NGO** respondent noted that the impact on driver comfort was missing, which could be improved by information prior to journeys. Another respondent noted that the benefits of C-ITS deployment would be dependent on the way in which C-ITS devices dealt with non-connected users, while they also missed the impact of C-ITS on vehicle use and the consideration of older drivers. An NGO representing cyclists underlined points that they had made previously that the development of C-ITS should be undertaken in the context of its potential role in a wider mobility system that had broader health and environmental objectives. Without such a wider perspective, they were concerned that C-ITS would...
increase the advantages of private motor vehicles and thus contribute to, rather than help to address, the mobility challenges that many cities were facing. Additionally, the deployment of C-ITS could lead to authorities spending money on C-ITS infrastructure that might be better spent meeting other objectives.

Rather than raising impacts that had been missed, **citizens** responded with various other responses. One noted that, as the penetration of C-ITS in the vehicle fleet would be slow over the next decade, the impacts would also be limited. They also noted that using 3G/4G equipment in cars would not lead to any additional costs. Another citizen underlined that human behaviour should not be ignored, and that changing this would not be possible with only technology. Another respondent noted that C-ITS was the first step towards citizens having greater trust in automation, while technologies such as platooning should improve the working conditions for drivers of heavy duty vehicles.

Of the respondents that classified themselves as ‘**Other**’, one implied that a missing impact was the need for increased administration. Another underlined the potential for C-ITS to facilitate multimodality and inter-modality, while a third noted that the spread of C-ITS could be the starting point for the rapid deployment of autonomous cars. The need for a greater consideration of the urban component of C-ITS was raised by one respondent, who highlighted that a commitment to use C-ITS to increase the share of public transport was missing, as was the participation of urban operators and communities in the preparation of the relevant EU legislation and in the standardisation bodies.

2.3.4 Q20. Please indicate your level of agreement with this statement (n=132)

“The Commission considers that common specifications for C-ITS will help ensure that progress is made by all actors across the value chain in a consistent and harmonised manner. This in turn is expected to reduce administrative burden and to broaden the C-ITS market and make it more accessible, in particular for Small and Medium Enterprises.”

From the 132 responses received, 39 (30%) indicated they strongly agreed with the Commission’s statement concerning common specifications for C-ITS in helping progress is made, along with another 64 (48%) stating that they agreed (see Figure 2-31). Another 17 respondents (13%) neither agreed nor disagreed while, in comparison, only two respondents (1.5%) stated they disagreed with the statement.

**Figure 2-31: Response on level of agreement with the statement concerning common specifications for C-ITS in helping ensure progress is made, along with decreasing burdens and increasing accessibility (n=131)**

Figure 2-32 highlights that, when disaggregated by stakeholder group, the level of agreement is split approximately equally, with at least 60% of respondents from all stakeholder having agreed or strongly agreed with the statement, and up to 90% for public authorities. Association respondents were most strongly in agreement with 14 out of 36 (38%) indicating they strongly agreed. Respondents who strongly disagreed were from private companies or associations, however this number was negligible (2-3%).
2.3.5 Q21: Please elaborate on your answer to the previous question (n=71)

Seventy one respondents elaborated on their answer to Question 20. Twenty one responses came from associations, 19 from private companies and 15 from representatives of public authorities. Of the remainder, six each came from NGOs and citizens, while four came from those who classified themselves as ‘other’.

The majority of respondents from associations that elaborated on their response to Question 20 agreed with the Commission’s statement. Of those that strongly agreed, a similar response from two associations representing insurers noted that without standardisation and ‘legally enforced transparency’ small and medium-sized enterprises (SMEs) would be prevented from accessing the C-ITS market, which would then favour the ‘big players’. A network of ITS interests noted that standardised message formats allowed new services to be developed, which opened opportunities for SMEs. An association representing those that traded in automotive parts argued that technical developments based on standards could be implemented more quickly to the benefit of all parties, thus enabling innovation.

Of those associations that only agreed with the statement in Question 20, one representing the bicycle industry raised a similar point that standardisation would benefit all market players, with SMEs benefiting in particular if protocols were set up in a way that did not significantly increase administrative burden. Another association representing telecommunications providers (and a company) referred to a study that suggested that SMEs were expected to play a role in the installation and operation of C-ITS. An association representing transport operators (and similar responses from three cities) noted that standardisation helps to create investment security, while an association representing digital interests underlined that their interpretation of ‘common specifications’ meant technology neutrality. A city network appreciated EU leadership in the development of the policy framework, but noted that it was up to businesses to build a market.

Of those that neither agreed nor disagreed with the statement in Question 20, an association representing suppliers noted that standardisation would benefit the entire industry, not SMEs in particular. Two organisations representing consumers provided similar responses, noting that it was not clear whether SMEs would benefit from the C-ITS market; indeed they suggested that it was more likely that manufacturers and tier 1 suppliers would dominate the market. An association representing road operators strongly disagreed with the statement arguing that there was a risk of certain statements
being taken for granted without there being a wider assessment of the impacts on all of the components of the supply chain.

Of those private companies that strongly agreed with the statement preceding Question 20, two suppliers highlighted that standardisation provided certainty for investment, while two suggested that otherwise C-ITS would not be deployed in the EU. One of the former noted that standardisation also facilitated the expansion of C-ITS to other vehicles, transport modes and applications. A company involved in the repair and replacing of vehicle parts noted that it was important to consider the entire value chain, and so reiterated a call for a level playing field that provided equal access to connected car data.

A supplier that agreed with the statement noted that simplification and market development are two of the benefits that might be expected from standardisation, while another noted that standardisation would bring greater security for the planning of investments. Another supplier noted that standardisation would help to avoid the errors of the past, particularly with respect to there being different road toll collecting systems in different EU Member States, while another underlined that too strict regulation could prove counter-productive. While noting that the administration costs would decline as a result of standardisation, another supplier disagreed that these would decline substantially. A telecommunications provider suggested that standardisation that was driven by industry was more likely to result in harmonised profiles.

Two companies, a telecommunications provider and an ITS service provider, neither agreed nor disagreed with the statement, as they were not convinced that standardisation would reduce administrative burden. One even suggested that the increased transparency resulting from standardisation may even put off SMEs from trying to enter the market. A consultancy noted that the statement in Question 20 was dependent on the nature of the specifications that would be put in place, while a supplier noted that a lot was dependent on the action that was taken by Member States. A consultancy that strongly disagreed with the statement implied that companies should be left to compete with each other to develop and deliver the most cost-effective solution for particular needs.

A respondent from a public authority that strongly agreed with the statement suggested that work early on to ensure standardisation would bring added value later, while another noted that only with common specifications would C-ITS be widely deployed. A national roads office noted that their positive response was conditional on the specifications not being too detailed.

Of those public authorities that agreed with the statement, a national ministry noted that in principle the statement was correct, but that in practice it depended on the room for innovation and the scope for further development in the value chain, which was crucial in determining the role that SMEs might play. A regional authority noted that SMEs can benefit from government intervention, but that it was important that specifications did not disrupt the market. Two similar responses from city authorities (and a citizen) noted that while standardisation facilitated entry into the market, it reduces the freedom to innovate, although on balance they supported standardisation. A national roads authority noted that common specifications were important to reduce the economic risk associated with investment, while a regional authority made a similar point: that with common specifications, they would invest more quickly. A national transport administration called for a distinction to be made between roadside ITS-G5 and cellular services, as they considered these to be alternatives not complementary, as well as a distinction to be made between services provided commercially and those provided by authorities.

A national ministry neither agreed nor disagreed with the statement arguing that while common specifications help progress, when dealing with technological matters they should be flexible and avoid imposing administrative obstacles to the development of technology; hence, they preferred flexible, softer approaches. A city authority disagreed with the statement, as it was not convinced that C-ITS would reduce administrative burdens.

All of the NGO respondents that elaborated on their response to Question 21 agreed with the statement. One noted that common and open specifications would facilitate market entry. Another two were more cautious, with one noting that this would be the case as long the specifications were not set by the larger industrial players, while the other noted that for the statement to be true the EU would have to ensure the effectiveness of the specifications.

A citizen that agreed with the statement noted that the specifications needed to be future proof and to avoid locking in a particular technology, while another noted that common specifications were a necessary, but not sufficient condition, as success depended on many other factors. A citizen who neither agreed nor disagreed with statement noted that it was not possible for them to have an opinion,
as this would depend on the content of the specifications, but that if the latter were future proof and did not lock in a particular technology that they would ‘strongly agree’. Another citizen thought that while making things easier for SMEs would be positive, that these companies would only be bought out by larger companies. A citizen that disagreed with the statement felt that standardisation decisions were generally taken in the interest of the larger companies.

A response from a respondent who categorised themselves as ‘Other’ suggested that common specifications would promote an open market, as long as these were future-proof and technology-neutral, while another underlined that leaving the various stakeholders sufficient room for manoeuvre was important. Another respondent felt that the statement about reduced administrative burden made little sense, as it was not clear to what this was being compared.

2.3.6 Q22. What do you expect to be the main benefits to you / your organisation of substantial deployment of C-ITS? If possible, please include quantifiable examples (n=111)

“The Commission expects that the deployment of C-ITS will have significant benefits in increasing road safety and reducing congestion. At the same time, it is seen as an important stepping stone towards connected, cooperative and automated mobility, and it will significantly contribute to improved traffic and travel information. As a result, the deployment of C-ITS could considerably influence people's travel choices in the future.”

There were one hundred and eleven responses to the question asking about the main benefits of C-ITS for the respondents. The majority of these came from associations, private companies and public authorities, which provided 30, 31 and 29 responses respectively. Eight of the remaining responses came from NGOs, six were from citizens and seven came from those who classified themselves as ‘other’.

Several responses from associations set out visions of the potential opportunities that a substantial deployment of C-ITS might bring for their members, and for consumers and society more generally. Two associations (and a company) provided a repeated response that the current periodic technical inspection (PTI) of vehicles would need to be complemented in cars that were capable of ‘highly automated driving’ by a system of automated inspections of on-board systems undertaken by independent organisations. In the longer-term, the electronic systems could be subject to continuous monitoring, although the PTI would still need to check that the vehicle had the right versions of the software.

A repeated response from six associations representing distributors of replacement automotive parts and diagnostic tools (and one private company) noted that the ability to remotely access a vehicle, its data and resources would enable the status of the vehicle to be monitored while it is being driven. This would enable the provision of services, including in-use emissions monitoring and predictive repair and maintenance services. An association representing automotive importers provided a similar response that real-time access to a vehicle’s status would allow the development of services for the consumer.

Two associations representing insurers provided similar responses that drivers could be informed about critical accident risk situations by real-time communication, and thus directly improve the functioning of the vehicle, e.g. emergency braking. They envisaged powered two wheel vehicles and rescue vehicles also being equipped with C-ITS that could prevent accidents, including applications to support turning left and dealing with intersections and curves. An association representing cyclists foresaw the application of 5G-compatible C-ITS in all vehicles, which would enable vehicles to know whether other vehicles or bicycles were coming in their direction, allowing their speed to be automatically adjusted. An association representing the bicycle industry saw C-ITS as enabling improved interaction with two- and three-wheeled vehicles, thus improving safety and enabling these vehicles to be fully exploited in the context of a low emission, healthy transport system based on the concept of ‘mobility as a service’.

An association representing telecommunications providers noted that LTE connected cars, the numbers of which are continually increasing, would enable the easy roll-out of C-V2X chipsets, which would enable synergies between V2V safety services and area-wide communication. This would enable a range of business models, including ‘infotainment, traffic information, real time mapping and data analytics’, and ultimately lead to fully autonomous cars that would revolutionise transport. Another telecommunications association believed that C-ITS would bring synergies, improve operational
efficiencies and facilitate the development of new business models involving different industries. Another association representing telecommunications providers (and a similar response from two manufacturers) believed that a large scale deployment of C-ITS, which would come at a cost to manufacturers, would provide investment security that would lead to improved road safety and efficiency. Two consumer associations provided similar responses that C-ITS promised some benefits in road safety, traffic and road network management, comfort and mobility efficiency more generally, although they were not convinced of its business case. A similar organisation highlighted the potential for improvements in safety. Safety improvements were also the main benefit identified by an association representing road operators and two associations representing ITS interests, one of which also highlighted improvements to congestion and air quality, as well as reduced expenditure on infrastructure. An association of transport operators (and similar responses from three cities) highlighted improved safety, particularly at intersections on roads and between road and rail, as well as for cyclists and pedestrians. They also saw benefits from common data formats and the creation of a ‘data chain’.

The focus of other associations was on the benefits of C-ITS for improved efficiency. An association representing logistics interests expected there to be better flows of transport, better use of infrastructure, more real-time information and better enforcement and control as a result of C-ITS. A consumer association foresaw a shift towards networked driving and networked mobility involving all modes of transport. Noting that the motorway network that operated under concession was already smart, an association representing road operators saw C-ITS contributing to the evolution of services and functions that were effective and sustainable from the perspective of costs and benefits.

Various respondents from private companies noted that the benefits of C-ITS to them would be increased sales or increased market opportunities. Such responses were received from companies that provided: security technology for C-ITS; road safety solutions; connectors, antennas and wireless modules; ITS services; V2I instruments; wireless technologies; real-time maps with road conditions; C-ITS cloud servers; satellite communications technology; C-ITS consultancy; C-ITS R&D; and repair services enabled by remotely accessing vehicles (as long as this was ensured by an appropriate EU legal framework). A supplier noted more generally that they anticipated increased sales per annum and more jobs.

Others highlighted more general benefits, including better communication channels to road users (a road operator), improved quality of train services through automatic train operation (a rail passenger company) and enabling smart charging devices (a supplier). A manufacturer highlighted that C-ITS, as a result of increased safety and reduced congestion, would bring about more efficient and sustainable transport systems, which was at the core of their business. Another manufacturer noted that the main benefit would be seen in the organisation of traffic, while a supplier suggested that there would be fewer accidents, less disruption to traffic and less congestion, and so more predictability in schedule planning and travel times, as well as new opportunities in the form of automated vehicles and platooning.

The benefits identified by many of the public authorities were in terms of the wider benefits of C-ITS to society. In this respect, 16 public authorities mentioned improved safety, 14 improved efficiency or better management of the road network (including reduced congestion) and seven mentioned benefits in terms of reduced emissions and pollution. Of those that identified improved efficiency as a benefit, three noted that this was due to better information being provided to road users, while a further four identified the provision of better information as a benefit in its own right, with two making a specific reference to better information about particular incidents. A regional authority noted that information would facilitate multimodal and intermodal mobility services, as well as improving the reliability of, and even shortening, delivery times.
A city authority noted that it saw such benefits for all modes of transport, not just for cars, while a national ministry noted that the speed of deployment in the market would be decisive in delivering these benefits. A repeated response from two cities noted that they did not expect C-ITS to deliver reductions in congestion unless it was used along with fiscal or traffic management measures.

Some authorities noted wider, or sometimes more specific, benefits that a significant roll out of C-ITS would bring to them. One national authority noted that C-ITS would facilitate the strategic management of the entire road network, and also that it would contribute to strengthening industry. A regional authority also believed that C-ITS was a first step to the better management of the available infrastructure capacity. A regional authority noted that C-ITS would lead to a wider range of mobility options, but warned that by improving the performance and comfort of car travel, there was a potential risk of modal shift to cars. A national roads authority noted that C-ITS may enable a new platform for infrastructure charging and tolling, as well as supporting the better integration of public and individual transport and ‘mobility as a service’ initiatives. A city authority noted the potential benefits of C-ITS in prioritising certain road users and of warning users about potentially dangerous intersections.

More specific benefits that were noted by public authorities included: facilitating better access to services and activities by those with mobility problems (a city authority); and enabling the reinstatement of bus services, which have disappeared, with automated transport systems (a municipality). A national ministry believed that C-ITS would lower the costs of road maintenance and reduce expenditure on new road infrastructure. Another national ministry argued that for C-ITS to deliver better services at lower cost, it was essential to reuse the existing cellular infrastructure.

Two public authorities identified that a long-term benefit of a significant deployment of C-ITS was high levels of automation in transport, while two authorities highlighted that C-ITS would support ‘better mobility’ more generally. A city authority anticipated that C-ITS would lead to the creation of jobs. On the other hand, two public authorities felt that it was not possible to know what the benefits of C-ITS might be at this stage.

Improved road safety and less congestion or more efficient transport were also mentioned, respectively, by four and two NGO respondents. Additionally, two NGOs foresaw benefits for people with physical or visual disabilities, both in terms of making use of the transport system in general and in terms of access to jobs. On the other hand, an NGO representing motorcyclists was not yet sure of the benefits, but did note that motorcyclists would have different needs from C-ITS compared to other road users. An NGO representing cyclists noted that C-ITS would enable public authorities to control traffic, prioritise active modes and public transport over cars and redirect traffic away from residential and urban areas. They also noted that C-ITS could be used to integrate public bike sharing schemes and electrically-assisted bicycles into the wider mobility system, which could provide data to help public authorities make informed policy decisions. They also reiterated the point that using Intelligent Speed Assistance to limit the speed of cars had the potential for significant road safety benefits and noted that C-ITS could be used for enforcing traffic rules.

Three citizens also mentioned the potential benefits from C-ITS in terms of improved road safety and less congestion/more efficient use of roads. One of these noted that, in the longer-term, C-ITS facilitated automated vehicles. Another noted that there would also be new jobs, improved competitiveness for industry, better traffic monitoring, better responses to incidents and more predictable arrival times. A citizen also noted that potential areas of new research would be opened up.

Four of the responses from those who categorised themselves as ‘Other’ mentioned the benefits of C-ITS on efficiency, three mentioned the impacts on safety and two the environmental benefits. One noted that these benefits were to be expected, along with improved comfort more generally, whereas the benefits from individual C-ITS applications were likely to vary, depending on whether they focused on safety, improved efficiency, etc. Another respondent mentioned the substantially increased amount of data about traffic that would become available. Other responses implied that there was a need for more research on the anticipated benefits of C-ITS and underlined that C-ITS had to be used in favour of shared, collective mobility and so be used to change the distribution of modal use in favour of public transport.
2.3.7 Q23. What do you expect to be the main costs and burdens to you / your organisation of substantial deployment of C-ITS? If possible, please include quantifiable examples (n=95)

There were ninety five responses in response to the question about the potential costs and burdens of C-ITS on the respondents. Twenty four responses came from associations, 26 from private companies and 27 from public authorities. Of the remaining responses, seven came from NGOs, six from citizens and five from those who categorised themselves as ‘other’.

Many associations set out where there would be costs for their members from the substantial deployment of C-ITS. Two associations (and a company) representing vehicle inspection interests noted that investment would be required in the development and validation of new testing procedures and appropriate testing equipment and facilities. A repeated response from six associations representing distributors of replacement automotive parts and diagnostic tools (and one private company) noted that the main additional costs would be for the development of new software applications to provide new services, although they noted that these services had the potential to significantly reduce the logistical requirements associated with the delivery of replacement parts. Similarly, an association representing traders in replacement parts noted that the main costs would be associated with the development of software associated with new services.

An association representing vehicle manufacturers noted that the costs for their members would be high, as a result of the need for increased interoperability and security requirements, particularly the need to ensure that the software for the latter was kept up-to-date. A network of ITS interests implied that the costs of C-ITS would be included in the cost of developing advanced vehicle assistance systems, which would be priced accordingly. An association representing suppliers estimated that the costs would be less than 1% of the turnover related to vehicle production for the first five years, followed by no substantial costs in subsequent years.

An association representing telecommunications providers foresaw the need for significant investments from their sector to ensure that C-ITS was able to function continuously and seamlessly. They highlighted the need to ensure that the possibility of network sharing between telecommunications operators was retained and that the ‘imposition of access obligations must not be weakened’ in order to ensure that solutions could be offered on competitive terms. Another telecommunications association (and a private company) referred to a study that concluded that mandating interoperability between IEEE 802.11p and PC5-based systems would increase costs for in-vehicle equipment as a result of the need to have equipment for both technologies and the need to maintain two radio systems.

A city network identified the main costs as being those associated with the integration of C-ITS into existing traffic management and ITS architecture. An association representing transport operators (and similar responses from two cities) identified a range of costs including: those associated with investing in the necessary roadside devices; upgrading existing systems; and the control and processing of the necessary data. A national association representing road operating companies estimated that the investment needed to implement and maintain the necessary equipment on the roads managed by their members amounted to €600 million between 2018 and 2022, which did not include a 20% increase in costs for maintenance, staff and the renewal of the system. Another, similar association was not able to provide an estimate of costs, but underlined that C-ITS should build on what has been put in place so far and that the process needed to be well-defined, effective and sustainable, both in terms of its costs and impacts. An association representing logistics interests noted that the costs for their members would include investments in vehicles and a contribution to the costs of public investments, either through road charges or other taxation.

Two associations representing insurers did not expect any costs for their members, while an association representing consumers noted that a challenge for C-ITS was ‘last mover advantage’, as some of those involved might wait for others to invest in order to maximise their benefits and minimise their implementation costs.

From the perspective of private companies, two vehicle manufacturers noted that their costs would be affected by the need to ensure interoperability and security, with one emphasising that these would be incurred over the lifetime of the vehicle. A transport operator noted that their costs would be associated with the technical equipment relating to the vehicle and the associated IT equipment. A supplier of C-ITS security services identified their main costs as being those associated with the initial development of the services and the hosting and operation of the services, noting that the latter would incur the majority of the costs. They underlined the need to take account of these potential costs in the
development of the legislative framework so as to strike the right balance between costs and benefits. An ITS service provider noted that their IT costs could be significant, while a similar company noted they would be shift to a more service-orientated model, which would require initial investment followed by operational costs. Another ITS service provider noted that their largest cost would be attracting and retaining suitably qualified staff, followed by the cost of obtaining data. A telecommunications provider noted that the costs associated with providing a communication network of sufficient density would be substantial, but that this was only an issue where the case for subsequent financial benefits was not clear. A supplier anticipated that their research costs would increase by more than €20 million a year.

A company involved in the repair and replacement of vehicle parts noted that, without a clear legal framework on access to connected car data (as they had mentioned in previous answers), there would be an extensive burden on their company. A supplier noted that they would expand their company as a result of the substantial deployment of C-ITS, but underlined that this was positive. A supplier raised cost issues around the choice between 802.11p and c-V2X technologies.

A road operator noted that their costs associated with installing roadside equipment had been reduced as a result of their involvement in a C-Roads project, while a supplier noted that there were risks for long-term R&D spending (as a result of intellectual property issues) from the need to work with companies in different sectors. A network of ITS research interests suggested that, as the principles of C-ITS and the necessary design criteria were not fully understood by some of those involved in C-ITS, cost assessments were often inadequate. A consultancy noted that making transport safer would cost money, and that these costs would be passed on to the consumer in some form. On the other hand, a supplier and a telecommunications provider did not expect any substantial costs for their respective companies.

Several responses from public authorities repeated similar anticipated sources of costs, with nine city or regional authorities mentioning roadside equipment, three mentioning the need for investment in central C-ITS equipment and four noting that investment would be needed for the processing of the data. Two cities (and a citizen) highlighted that it was not just about roadside infrastructure for C-ITS, but about ensuring that other roadside signs for communicating with road users were capable of presenting the necessary information, while also noting that the digitalisation of the system should not exclude ‘non-digitalised’ users, such as pedestrians and cyclists. Four authorities explicitly referred to the need to make changes to traffic lights. A regional authority noted that the costs associated with potentially using cellular communication equipment, and also noted that it might be necessary to purchase more detailed traffic data.

A couple of authorities also noted that there would be new roles for public authorities as a result of C-ITS, with the implication that this would need additional qualified personnel. One city authority noted that in order to make the most of C-ITS, there would need to be an increase in computing capabilities, e.g. to forecast the use of the network. A regional authority noted that there would be costs associated with pilot projects and with participating in national and international knowledge networks, while a city authority stated that there would be a general need to adapt to new regulations.

The main cost identified by national ministries and authorities was in relation to the cost of the roadside equipment, which was mentioned by five of these. Three also mentioned the costs of integrating C-ITS into existing systems, while four identified the development of the necessary central C-ITS systems as a significant cost. One national ministry mentioned the costs associated with upgrading of traffic management systems, while another noted that its main costs would be in relation to the necessary legislation.

One national ministry implied that funding C-ITS infrastructure would be challenging, as the expenditure had not been allocated in the current expenditure plan. Another national ministry noted that the costs would be dependent on the way in which C-ITS were deployed, while a third noted that, apart from the platform, the costs would be very low if C-ITS were based on cellular technology, whereas basing C-ITS on roadside units would be unaffordable. A national roads administration also noted that they foresaw that 3G and 4G would be used to cover most of their major road network.

From the perspective of NGO respondents, the cost of retrofitting C-ITS into existing vehicles and the costs associated with the provision of information and the education of their members about C-ITS were mentioned. An association representing motorcyclists noted that the costs of C-ITS for their members would be higher, as a result of their particular needs and the smaller number of vehicles over which the costs would be spread.
An NGO representing cycling interests questioned spending limited public resources on more (C-ITS) infrastructure for cars, when the money could be better spent on other measures, including those that prioritise public transport, walking and cycling, which delivered wider benefits. They were concerned that increased reliance by drivers on C-ITS would reduce non-verbal communication between different transport users, which could adversely affect safety in urban areas. They suggested that there were other ways of delivering the benefits that were claimed could be delivered by C-ITS. They also noted that, as deployment was likely to be limited at the start and also that only some actions would be subject to C-ITS, there would be uncertainties about how different road users might change their behaviour as result of C-ITS, which could have negative consequences for safety.

From the perspective of citizens, two mentioned the costs of roadside equipment, with one of these noting that the lifetime of equipment, particularly electronic devices, was often over-estimated. Two suggested that there would be a cost associated with purchasing C-ITS services when industry was not providing these, while two noted that there would be costs associated with fitting C-ITS into vehicles. A societal cost noted by one respondent was that C-ITS technologies would lead to a ‘dumbing down’ of the skills required for driving and to a greater disregard for those skills.

The responses from those who had categorised themselves as ‘Other’ varied. One noted that the costs associated with roadside equipment, the upgrade and integration needed at central C-ITS stations and the implementation or purchase of C-ITS services when industry did not provide these would all be substantial. One noted the need to contribute to the implementation of the necessary legislation and another that C-ITS would open up new research fields. A public company operating public transport identified a number of costs from their perspective, including: in-vehicle equipment for buses; the modernisation of control centres; the introduction of the necessary communication equipment; and the need to inform drivers and users about C-ITS.

2.4 Additional comments

2.4.1 Q24. Do you have any additional comments regarding this consultation questionnaire? (n=54)

Fifty four respondents had additional comments on the questionnaire, of which 21 came from associations and 15 from private companies. A further nine responses came from representatives of public authorities, four each from NGOs and those who classified themselves as ‘other’ and only one from a citizen. Many comments did not need to be reflected in this section, as they were inconsequential to the analysis of the views of stakeholders, e.g. thanking the Commission for the opportunity to share their views. Only those responses that provided information of relevance to the analysis are mentioned below.

A number of additional comments from associations reiterated points that they had made in response to previous questions. A similar response from seven associations representing distributors of replacement automotive parts and diagnostic tools (and one private company) believed that C-ITS had the potential to bring significant benefits, but that these would be limited and costs increased, unless there was ‘direct interoperable access to the vehicle, its data and resources via an interoperable, standardised in-vehicle telematics platform’.

An association representing telecommunications providers made reference to two papers (see Section 3). The first of these, from the GSMA underlined that technology neutrality should be a core principle underlying the development of the ‘European communication framework’, so the Commission should avoid effectively mandating 802.11p as the technology to be used for V2V safety-related services. The second paper, from 5GAA, identified a practical approach to ensure that LTE-V2X and 802.11p were able to coexist in the same band of the radio frequency spectrum. Another similar association (and a private company) underlined the need for a technology neutral regulatory framework for C-ITS, which allowed for the coexistence of C-V2X and IEEE 802.11p in the 5.9GHz band of the radio frequency spectrum, while facilitating the setting out on the path to use 5G for future connected, cooperative and automated mobility.

An association representing public transport operators stressed that public transport, and shared mobility in a wider sense, should be at the heart of the deployment of C-ITS. They underlined that C-ITS was only a means to an end, and so should be used as part of a wider policy that aims to reduce congestion and pollution. A similar association went further arguing that in a time of limited public
resources, C-ITS should not be a priority for public funding. On the other hand, if C-ITS were implemented they argued that it should be used to prioritise public transport.

An association representing vehicle manufacturers (and two manufacturers) noted that the questionnaire should have also covered V2I and I2V, as well as V2V, as it was important that the deployment of equipped vehicles and roadside units was synchronised to deliver better performance, efficiency and return on investments. Two networks of ITS interests noted that it would be important to ensure that research projects do not disrupt the operation of C-ITS applications once manufacturers begin to introduce these on their vehicles. A consumers’ association welcomed the work of the ITS Advisory Group and noted that this should be complemented by a high degree of participation from user associations. An association representing road operators felt that the questionnaire was only a partial reflection of the stakeholders involved in the supply chain, as the role and responsibilities of road managers, as well as the existing systems that were in place, were not given sufficient consideration.

There were fewer additional comments from private companies. A manufacturer noted that a consideration of ‘service bundles’ was important, and suggested that the questionnaire should have focused on Advanced Driver Assistance Systems. A supplier noted that its C-ITS technology was also used in other transport modes, while a consultancy pointed out that the survey did not mention access to vehicle data by third parties. A car rental company noted that it had jointly developed a paper that contained a set of principles and use cases, as well as a proposal to ensure ‘secure, direct, real-time, interoperable and open access to in-vehicle for all third-parties through a neutral car platform’ (see Section 3). A company involved in the repair and replacement of vehicle parts again called for a ‘clear legal framework on access to connected car data now and in the future’.

From the perspective of public authorities, a national ministry reiterated a point that it had made in response to previous questions. This was that vehicle manufacturers were currently evaluating two possible technologies for providing C-ITS and so any legislative framework needed to be as technologically neutral as possible in order to allow the coexistence of these two technologies, at least in the short-term. In this respect, they noted that the US had not yet implemented its decision to make 802.11 equipment mandatory and that China was focusing on a cellular solution. Another national ministry made reference to an additional paper that it had submitted (see Section 3). A national roads authority felt that the questionnaire could have had a more explicit mention of freight, as well as more on the cooperation needed between different stakeholders. A city authority noted that it felt that the questionnaire was not always clear about what it was asking about.

An NGO underlined that it should be remembered that there will always be unconnected road users in additional to connected vehicles. Two of the respondents that classified themselves as ‘Other’ underlined that the questionnaire did not cover the role and importance of public transport in C-ITS. One noted that C-ITS should give priority to public transport, and to shared mobility more generally. The other reflected responses from other public transport operators and associations in response to previous questions. They called for the greater consideration of the urban environment in the C-ITS debate, which should be used to increase the modal share of public transport, and the greater involvement of urban interests in the development of the C-ITS legislative framework and in the relevant standardisation bodies. At the same time, they emphasised: the need to maintain freedom of action at the local level; that there should be a basic level of common open standards; that there should be no overly prescriptive top-down requirements affecting urban areas; that there should not be an excessive financial burden placed on operators when deploying C-ITS; and that EU funds should be used to support such implementation.
3. Analysis and summary of Ad Hoc responses

In addition to their responses to the questions included in the online public consultation, a number of stakeholders uploaded, or made reference to, additional documents. These are summarised in this section, starting with the additional documents provided by associations, followed by those provided by private companies, public authorities, NGOs and those who categorised themselves as ‘Other’.

Various additional documents were submitted by associations, many of which supported themes that had been raised in response to previous questions. A report produced for the European Commission by TRL² was referred to by various associations, including EGEA (European Garage Equipment Association), FIGIEFA (European Federation of Independent Distributors of Automotive Replacement Parts and Components and Insurance Europe), as well as some companies. They referred to this report, as well as to the outputs of the OVERSEE project³, to call for legislation to ensure access to in-vehicle data. Additionally, Enterprise provided a paper in which they set out some key principles for different use cases that they saw as important to ensure fair access to in-vehicle data for third parties⁴, which also referred to the TRL report.

The Gesamtverband Autoteile-Handel (GVA), an industry association representing the independent automotive parts wholesale trade in Germany, had similar concerns. It submitted its response to a Green Paper on ‘Digital Platforms’ that was prepared by Germany’s Federal Ministry for Economic Affairs and Energy⁵. While recognising that C-ITS had the potential to bring significant benefits, the GVA underlined the need for their members to have direct access to the vehicle, its data and resources, through an interoperable, standardised in-vehicle telematics platform.

Another German association, the Association of Technical Inspection Agencies (VdTÜV e.V.), submitted its own paper on ensuring safe and secure automated driving⁶. They underlined that the rules governing digitally connected vehicles should be harmonised in order to provide legal certainty for drivers. They highlighted that data relating to the vehicle and vehicle owner must be protected, yet the digital interfaces should provide secure, open and interoperable access for all market players. Further, they noted that the way in which connected vehicles were tested as part of type approval, but also in periodic inspections throughout their lifetime, must be continually developed, and drivers must be trained to use the new systems.

The European vehicle manufacturers association, ACEA, provided its position paper on how access to in-vehicle data could occur for third party services in a way that it considered to be fair, while striking a balance between the needs of the various actors involved⁷. ACEA also referred to two reports, which identified, and estimated the impacts in terms of reduced CO₂ emissions, of ITS that might be used for passenger cars⁸ and commercial vehicles⁹.

A report by Analysys Mason and SBD Automotive¹⁰, which was produced for the 5GAA, an association that represents telecommunications providers, was referred to by several similar associations, a company and a national ministry. The benefits of the respective scenarios developed in the report were cited as evidence in support of the use of cellular technology for V2X communication, or at least a technology neutral approach that allowed this technology to coexist with the technology based on IEEE 802.11p. In support of the same conclusion, a separate report from 5GAA concluded that the cellular LTE-V2X (PC5) would be better than 802.11p at reducing accidents¹¹. This report also concluded that requiring the former technology to be backward compatible with the latter would risk distorting the market in favour of the latter and deliver limited benefits. An additional paper from 5GAA set out the case for cellular V2X (PC5) compared to 802.11p, and the benefits for different stakeholders¹². A report from the GSMA, another association representing telecommunications providers, made similar points¹³.

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² TRL (2017) “Access to In-vehicle Data and Resources”, report for European Commission DG Mobility and Transport

³ https://www.oversee-project.com/index.html

⁴ Enterprise (2017) “The Future Mobility System: Technical solution and key principles to ensure fair access to in-vehicle data for all third parties”

⁵ GVA (2016) “Positionspapier: Stellungnahme zum Grünbuch Digitale Plattformen des Bundesministeriums für Wirtschaft und Energie”


⁹ ERTICO (2016) “Study of the scope of Intelligent Transport Systems for reducing CO₂ emissions and increasing safety of heavy goods vehicles, buses and coaches”

¹⁰ Analysys Mason and SBD Automotive (2017) “Socio-Economic Benefits of Cellular V2X”, report for 5GAA

¹¹ 5GAA (2017) “An assessment of LTE-V2X (PC5) and 802.11p direct communications technologies for improved road safety in the EU”

¹² 5GAA (no date) “The Case for Cellular V2X for Safety and Cooperative Driving”

¹³ GSMA (2018) “Safer and Smarter Driving: The Rollout of Cellular V2X Services in Europe”
The European Competitive Telecommunications Association (ECTA) submitted three reports. The first was a report from the Body of European Regulators for Electronic Communications (BEREC) and the Radio Spectrum Policy Group (RSPG) on facilitating mobile connectivity in challenging areas\(^{14}\). The second was the ECTA’s response to the initial BEREC/RSPG consultation\(^{15}\), while the third was the ECTA’s response to a more recent RSPG consultation on a roadmap towards 5G for Europe\(^{16}\). The first two illustrated the various technical aspects of ensuring connectivity in difficult situations and underlined the importance of taking account of competitive considerations and of ensuring that connectivity can be consistently provided for the maximum benefit of society. The third report provided insights on how the next generation of wireless communications technology should be introduced, including in relation to C-ITS, in order to ensure that competition continues to contribute to delivering the anticipated benefits.

A position paper from EUPAVE, the European Concrete Paving Association, set out its view of the role of connected, autonomous and electric vehicles and the role its members could play in supporting these developments, including in the context of C-ITS\(^{17}\). CONEBI, the Confederation of the European Bicycle Industries, referred to the EU Cycling Strategy, which it developed along with other cycling stakeholders\(^{18}\). This included a chapter dedicated to Multimodality and Intelligent Transport Systems, as well as electrically assisted bicycles, which were mentioned by some stakeholders in their responses.

The city network Polis underlined that there were many challenges for cities in relation to C-ITS. It noted that the nature of the problems relating to improving road safety and the efficiency of the use of the road network in cities were very different from those that existed on motorways. This was a particular challenge in relation to C-ITS, as many of the latter have been developed for the inter-urban, rather than the urban road network. It submitted reports from two projects, CIMEC\(^{19}\) and CODECS\(^{20}\), which set out in more detail these and other challenges for cities in relation to C-ITS.

The Union des Transports Publics et Ferroviaires (UTP), the organisation that represents French public transport interests, submitted an additional contribution\(^{21}\). In their submission, while supporting the deployment of C-ITS, they argued that C-ITS should be used to prioritise public transport and act as a catalyst for increasing shared mobility, which should be promoted by the legal framework being developed by the Commission. Consequently, they deplored the lack of reference to public transport in the consultation, noting that operators with autonomous metros would be able to inform the debate, and called for the inclusion of public transport stakeholders in the debate about C-ITS at the European level.

The Verbraucherzentrale Bundesverband (VZBV), representing German consumer organisations, submitted a paper that it had produced in response to a study in Germany on the use of data in the transport system\(^{22}\). This underlined that privacy for consumers and innovation in C-ITS must be reconciled, and that data protection should be seen as a ‘building block in the value chain of digital business models’. They also highlighted that the socially-responsible use of the data must be ensured, to make up for the imbalance in the contractual relationship between consumers and businesses.

The Associazione Italiana Società Concessionarie Autostrade e Trasporti (AISCAT), an association representing Italian road operators, submitted a paper that it had prepared in response to a ‘smart road’ initiative undertaken by the Italian Ministry of Infrastructure and Transport\(^{23}\). The paper underlined that, when talking about ‘smart roads’, it was important to make a clear differentiation between different types of road. In this respect, they underlined that the motorway network in Italy was already well structured and well managed, which should be taken into account in the development of the relevant policy.

Submissions from private companies were also submitted in support of issues mentioned in the rest of the consultation. Intel submitted the 5GAA reports mentioned above, along with many links and its own paper\(^{24}\), which provided a set of policy principles for connected vehicles. These underlined that: innovation and market competition, rather than regulation, should drive public policy in this area; that

\(^{14}\) BEREC and RSPG (2017) ‘Joint report on ‘Facilitating mobile connectivity in “challenge areas”’’

\(^{15}\) ECTA (2017) ‘Response to the public consultation by BEREC and RSPG on the draft “BEREC and RSPG Joint report on “Facilitating mobile connectivity in “challenge areas””’

\(^{16}\) ECTA (2018) ‘Response to the public consultation by RSPG on “Strategic Spectrum Roadmap towards 5G for Europe: 2nd Draft RSPG Opinion on 5G Networks”

\(^{17}\) EUPAVE (2016) “Connected, Autonomous and Electric Vehicles: Concrete infrastructure can pave the way”


\(^{19}\) CIMEC (2017) ‘C-ITS in European cities: The CIMEC project – Experience and Recommendations’

\(^{20}\) CODECS (2016) ‘Requirements of urban transport authorities regarding cooperative V2I and I2V systems and their strategic policy implications’, Project Deliverable 4.2


\(^{22}\) Verbraucherzentrale Bundesverband (2017) “Verbraucher als ‘Eigentümer’ von Mobilitätsdaten?” (Consumers as ‘owners’ of mobility data?)

\(^{23}\) AISCAT (2016) 'Iniziativa Smart Road: Position Paper’

\(^{24}\) Intel (no date) “The Internet of Things (IoT) and Automotive & Transport Policy Principles”
the focus should be on increasing the safety of transport; that there should be open standards; and underlined the need for viable partnerships between the public and private sectors.

Siemens attached three documents, the first of which was a joint paper with NXP Semiconductors and Cohda Wireless, setting out the case for 802.11p, as opposed to LTE and 5G, for V2X communications. This underlined that the former was ready to be deployed and argued that, unlike cellular technologies, it was able to address the most challenging V2X use cases. The other two documents were press releases, the first of which announced the publication by the C-Roads Platform of C-ITS specifications for Europe, while the second was the C-Roads Platform’s position paper on the use of the 5.9 GHz band of the radio frequency spectrum. The latter underlined that there should be interoperability between ITS-G5 / 802.11p and LTE-V2X / 5G and that road authorities should not be forced to equip their roads with two or more competing technologies. Additionally, it stated that the platform’s members were committed to ‘backwards compatibility’ criteria.

Autotalks submitted two documents, both of which focused on ITS-G5 technology based on the wireless standard 802.11p. The first was a letter to the US authorities, signed by Autotalks and many other stakeholders, while the second was a statement relating to EU policy, which was signed by Autotalks and other companies. Both argued that ITS-G5/802.11p (or DSRC in the US) was the only validated technology on the market capable of being used for C-ITS and that any other technologies operating in the 5.9 GHz band of the radio frequency spectrum should not interfere with each other, be interoperable and be able to co-exist with communications in the 5.8 GHz band.

HERE B.V. submitted a copy of the final evaluation report of the NordicWay C-Roads project, which was also referred to be Ericsson. It was underlined that this project demonstrated the potential for good results from C-ITS with only limited investment, when existing cellular infrastructure was used for the purpose of communication. Centaur Consulting Ltd submitted the final report of the CiMEC project, the focus of which was the implementation of C-ITS in cities, a project that was also referred to by Polis (see above). NIRA submitted a presentation that provided an introduction to their company.

Some public authorities submitted additional documentation directly addressing the consultation, while others provided reports that are of a more general interest. The French authorities submitted a note to complement their response to the online public consultation. This underlined a number of issues on which a European intervention on C-ITS should focus. They underlined that the EU policy framework should focus on interoperability in order to ensure the consistent use of C-ITS in all Member States and that it should facilitate the deployment of C-ITS through technological and functional considerations, rather than being prescriptive. Additionally, EU policy should address the issue of on-board equipment and data access arrangements in order to ensure a smooth functioning of the internal market, while also guaranteeing the protection of personal data and promoting research.

The Dutch authorities submitted two documents: a direct response to the consultation and a call for innovation partnerships in the context of their ‘Talking Traffic’ partnership. The former complemented their responses to the online public consultation. It underlined the importance of C-ITS for the future of road transport, but noted that it was important to distinguish between use cases, as the respective functional requirements will determine the optimal communication technology. In this respect, they supported a technology-neutral hybrid communication approach, which did not give preference or priority to a particular communications technology. Their position was informed by a recognition that it was possible to make better use of the existing cellular 4G LTE networks, while the further development of direct cellular communication (C-V2X) and 5G in the longer-term was considered to be interesting. They underlined the importance of a joint coordinated approach at the EU level to agree on technical standards and profiles for interoperability and continuity of services across national borders. Furthermore, they underlined that privacy and security, as well as a realistic testing of applications, would need to be addressed before C-ITS could be implemented on a large scale.

25 Bundesministeriums für Wirtschaft und Energie
26 C-Roads Platform (no date) “The C-Roads Platform publishes harmonised C-ITS specifications for Europe”
28 CiMEC Technology (2017) “Final project report – CiMEC deliverable D5.3”
29 NIRA Dynamics AB (no date) “Together for Smarter Safety”
30 Note des autorités françaises (2017) “Contribution des autorités françaises à la consultation sur des spécifications pour des systèmes de transport intelligents coopératifs (STI-C)”
31 Ministry of Infrastructure and the Environment (2016) “All for Innovation Partnerships for smarter and inter-urban mobility through intelligent services”

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The Ministry of Transport and Communications of Finland underlined the need to create an operational framework to support the use of automation, the utilisation of data and new mobility services to their fullest potential. However, they noted that in doing so deregulation and the need to reduce administrative burden should be retained as high priorities, so they had a preference for soft measures and industry standards as far as was possible. In relation to interoperability, they noted that clear minimum requirements were a necessity for the deployment of C-ITS, but argued against their mandatory introduction at this stage, preferring for a principle of interoperability to be agreed upon and implemented at the most appropriate level. They also noted that interoperability should not only be seen as an internal issue for C-ITS services, but also applied more broadly to include relevant infrastructure and other ‘Internet of Things’ systems, including smart city features. While recognising that a high level of security was critical and supporting a common EU framework, the Finnish Transport Ministry called for existing validated solutions and legal instruments (such as the proposed cyber security Regulation that is under discussion) to be taken into account when assessing the need for further legislation. In relation to privacy and data protection, they noted that rules relating to personal data processing should only be included in C-ITS specific legislation where they were needed to complement the GDPR, the relevant principles of which could be included in recitals of the proposed C-ITS Regulation. Finally, they argued that no mandate or other requirements relating to communications technologies should be included in the proposed Delegated Act.

The Portuguese Public Authority for Mobility and Transport (AMT) provided a direct response to the Commission’s consultation. They agreed that the implementation of C-ITS could be hindered by the lack of guidelines and a clear framework, as otherwise there was risk of a lack of interoperability that would prevent the benefits from being delivered. This should be addressed by future EU legislation in this area, which should ensure EU-level compliance, although this could include a soft approach, e.g. including guidelines. They underlined that it was important to consider the effects of the different options in terms of all their potential benefits, and to also understand all of the potential financial and economic impacts. The definition of minimum and overarching parameters should promote industrial innovation and allow consumers to make choices, while the regulator provided effective oversight of the market. They believed that any future change to the EU legal framework should open specifications that ensure the exchange and re-use of data in a transparent, neutral and non-discriminatory way and to ensure effective interoperability based on common rules and interoperable solutions. The protection of privacy and personal data was also a crucial factor for the successful implementation of C-ITS.

The Austrian Ministry for Transport, Technology and Innovation submitted its national C-ITS Strategy and also referred to the C-ITS corridor that is being developed to link Vienna with Rotterdam in the Netherlands, via the German city of Frankfurt. The submission from Vienna City Council provided information on the structure of transport in the city, and its financing. The German city authorities of Munich, Hamburg and Cologne submitted a report outlining the opportunities and challenges for municipalities from C-ITS. In addition, the city authority of Cologne, as well as that of Kassel, submitted a guide for public authorities on establishing C-ITS. The Swiss Federal Roads Office referred to a report from the Swiss Federal Council on the implications of automated driving for transport, which underlined that C-ITS would only contribute to reductions in congestion and CO₂ emissions if it was accompanied by further measures to ensure that excessive increases of traffic were not generated.

Two NGOs submitted reports published by the European Transport Safety Council (ETSC), one of which was submitted by the European Cyclists’ Federation and the other by the ETSC itself. The first of these set out the potential safety benefits and challenges of C-ITS, and concluded with some recommendations for both the EU and Member State level. It recommended that the priority should be on those C-ITS that improve safety and underlined that there was a need to make appropriate changes to both legislation governing vehicle type approval and roadworthiness testing. Other recommendations underlined: the need to define, and clarify access rights, to the information needed for ‘highly automated driving’; the need for clear human-machine interfaces; and the importance of providing relevant information to consumers. The second paper covered similar issues, but with more detail in relation to

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34 AMT (2018) “Consulta Pública sobre Sistemas Cooperativos de Transporte Inteligentes”
36 Stadt Wien (no date) “Verkehrsteuerung”
37 Wegeweiser des OCA AukIbV (no date) “Kooperative intelligente Verkehrssysteme: Chancen und Herausforderungen für die Kommunen”
38 Technische Universität München et al (2016) “Leitfaden für die Einrichtung kooperativer Systeme auf öffentlicher Seite”

Ricardo
their relevance to C-ITS. A report analysing the cost-effectiveness of measures and features that could be implemented to improve vehicle safety in the EU was also submitted.

The German Road Safety Council (DVR) submitted two of its own reports. The first of these made a series of recommendations relating to ‘automated driving functions’, including that the driving behaviour of these systems should not be different from that expected by human beings and that each system must be approved on an individual basis. The second focused on improving road safety due to V2X communication. This underlined that data privacy and security must be ensured, and proposed a set of requirements for the communication technologies that were used. It also underlined that: safety applications should not be restricted to cars; that the deployment of the relevant technologies should happen as quickly as possible; and that Euro NCAP should include V2X technology in its safety rating scheme.

A number of additional documents were supplied by those who categorised themselves as ‘Other’. A group of road authorities and operators cooperating within the European ITS Platform, who submitted a joint responses to the consultation, submitted one report from the Easy Way project, and referenced a report from the EIP+ project. The former presented a business case and cost-benefit assessment of the priority C-ITS considered by the project. The second underlined that, as a result of actions by road operators, C-ITS services contribute to improved road safety, traffic efficiency and environmental protection. A researcher from Eindhoven University of Technology also submitted two papers, both of which provided examples of business models for C-ITS.

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42 TRL (2017) “In depth cost-effectiveness analysis of the identified measures and features regarding the way forward for EU vehicle safety”, report for European Commission DG Internal Market
43 DVR (2017) “Automated Driving Functions”
4. Glossary/Acronyms

- ACEA – European Automobile Manufacturers Association
- ADAS – Advanced Driver-Assistance Systems
- AISCAT – The Associazione Italiana Società Concessionarie Autostrade e Trafori
- AMT – The Portuguese Public Authority for Mobility and Transport
- BEREC – The Body of European Regulators for Electronic Communications
- CEN – The European Committee for Standardization
- CEPT – The European Conference of Postal and Telecommunications Administrations
- C-ITS – Cooperative Intelligent Transport Systems - the use of technologies that allow road vehicles to communicate with other vehicles, with traffic signals and roadside infrastructure as well as with other road users. The systems are also known as vehicle-to-vehicle communications, or vehicle-to-infrastructure communications.
- C-ITS Platform – A platform developed by the European Commission (DG MOVE) in November 2014 to support the emergence of a common vision across all actors involved in the value chain in terms of the interoperable deployment of C-ITS systems in the EU.
- CIMEC Project – Cooperative ITS for Mobility in European Cities
- CIVITAS – City VITAlity and Sustainability – a network of cities for cities dedicated to cleaner, better transport in Europe and beyond.
- C-ROADS Platform – a joint initiative of European Member States and road operators for testing and implementing C-ITS services in light of cross-border harmonisation and interoperability.
- C-V2X – Cellular V2X (5G)
- DSRC – Dedicated short range communication
- DVR – The German Road Safety Council
- EATA Roundtable – The European Automotive Telecom Alliance roundtable meeting
- ECTA – The European Competitive Telecommunications Association
- EGEA – European Garage Equipment Association
- ETSC – The European Transport Safety Council
- ETSI – The European Telecommunications Standards Institute
- EUPAVE – The European Concrete Paving Association
- Euro NCAP – The European New Car Assessment Programme
- EU-13 Countries – Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak Republic, Slovenia
- EU-15 Countries – Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom
- FIGIERFA – European Federation of Independent Distributors of Automotive Replacement Parts and Components and Insurance Europe
- GDPR – General Data Protection Regulation
- GEAR2030 – a high level group on automotive industry which has analysed and discussed the key trends and challenges which will affect the automotive industry over the next 15 years.
- GMSA - GSM Association - a trade body that represents the interests of mobile network operators worldwide
- GVA – The The Gesamtverband Autoteile-Handel
- HORIZON 2020 – the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe’s global competitiveness.
- IEEE 802.11p – a wireless vehicle communication system
- ISA – Intelligent Speed Assistance - any system that ensures that vehicle speed does not exceed a safe or legally enforced speed.
- **‘IP-based’ communication networks** – Internet Protocol
- **ITS** – Intelligent Transport Systems - systems in which information and communication technologies are applied in the field of road transport, including infrastructure, vehicles and users, and in traffic management and mobility management, as well as for interfaces with other modes of transport
- **LTE-V** – LTE-Vehicle technology
- **MaaS** – Mobility as a Service - brings every kind of transport together into a single intuitive mobile app
- **NGO** – Non-governmental organisation
- **NordicWay** – a pilot project that seeks to enable vehicles to communicate safety hazards through cellular networks on a road corridor through Finland, Norway, Sweden and Denmark.
- **OEMs** – Original equipment manufacturers
- **OVERSEE Project** – a European research project, funded within the 7th Framework Programme of the European Commission, to contribute to the efficiency and safety of road transport
- **PC** – Public consultation
- **PTI** – Periodic technical inspection
- **RSPG** – Radio Spectrum Policy Group
- **SMEs** – Small and Medium-sized enterprises
- **Trans-European road network (TERN)** – a project to improve the internal road infrastructure of the EU
- **UTP** – The Union des Transports Publics et Ferroviaires
- **VZBV** – The Verbraucherzentrale Bundesverband
- **V2I** – Vehicle to Infrastructure
- **V2V** – Vehicle to Vehicle
- **V2X** – Vehicle-to-everything (V2V or V2I) communication is the passing of information from a vehicle to any entity that may affect the vehicle, and vice versa.
- **5GAA** – 5G Automotive Association