D2.3 CIMEC - Supplier Workshops

WP2 – Potential C-ITS solutions and standardisation

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Revision History

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1.0	22/08/2016	First version to be circulated among partners for feedback
2.0	28/08/2016	Second version taking into consideration comments from the consortium
3.0	02/09/2016	Final version

1. Introduction

1.1 Task activities

Within the framework of EU-H2020-CIMEC project and one of its objective of gaining better understanding of the challenges, enablers and barriers for use of C-ITS solutions in European cities, this deliverable (D2.3) comes into place, as one of the activity of WP 2, to bridging the gap between C-ITS deployment and deployment and city needs and requirements. This deliverable (D 2.3) is a direct input for both WP 1 and WP 2.

This task has been intended to provide targeted ITS/C-ITS suppliers with background information about cities' need and requirements, to gain perspective on where the competitive market is heading for cities, and areas for potential investments in C-ITS. In return, suppliers have been asked to share their expertise on how their C-ITS can meet city need, what are the likely cost and risk for C-ITS, and new possibilities made available through C-ITS and integration challenges.

Four one-day regional supplier workshops were planned (Germany for German-speaking countries, Norway for Scandinavia, UK for UK suppliers, Spain for southern Europe) with a focus on C-ITS end-to-end solutions for cities, and with the responses to the supplier questionnaire as starting point for the discussions.

The regional supplier workshops were to be evaluated in terms of common views, recommendations and expectations and also regional differences.

1.2 Deviation of task activities and new implementation strategy

The online survey reported in D 2.2, was also the intended tool for recruiting participants to the supplier workshops. The survey responses showed little interest from the suppliers to joining the workshops, resulting in lack of basis for organising the four planned workshops. Due to this situation, a new strategy/procedure was developed for this task, moving from inviting suppliers to workshops hosted by the project, to an approach going to suppliers where there are available.

According to this new strategy, face-to-face interviews were based on the existing questionnaire and the planned description as far as possible, and conducted in formal and informal meetings organized with supplier's representatives.

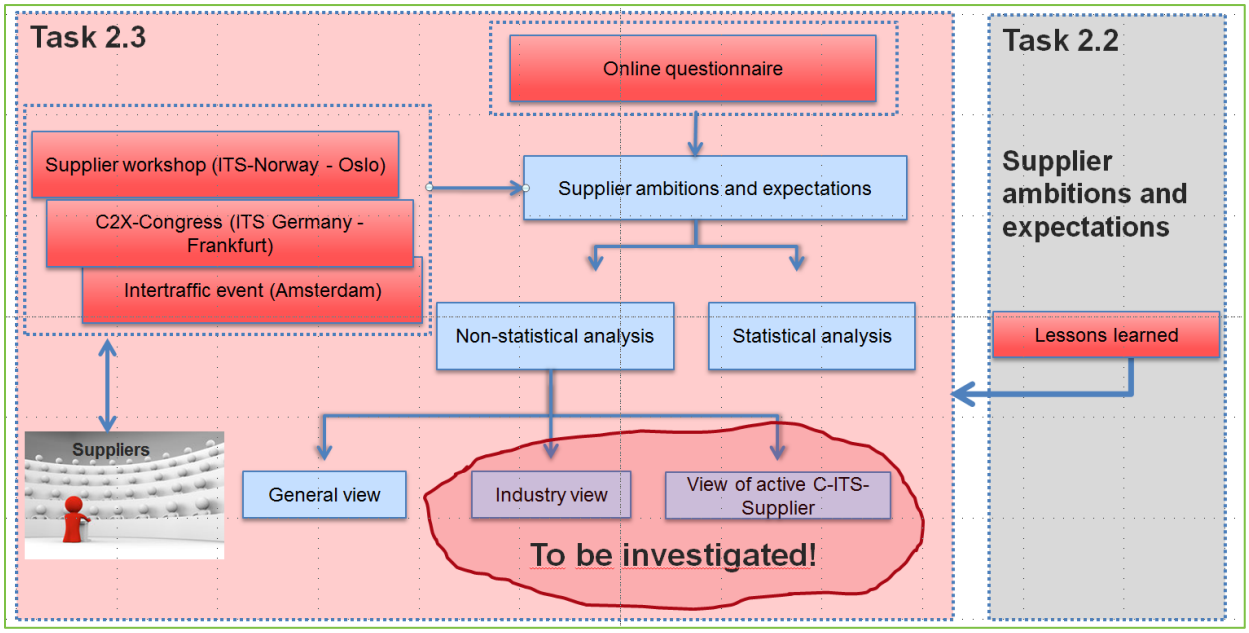
These interviews/meetings have been organized in the framework of the following events:

- Intertraffic Amsterdam - Amsterdam on the 5-6th of April 2016: (this is the largest and most prominent innovation platform in Europe for sustainable mobility solutions and products & services in the field of infrastructure, traffic management, safety and parking),
- ITS Norway congress - Oslo on the 9th of March 2016: (ITS Norway conference is a national event on intelligent transport systems organized annually by ITS Norway),

All responses from suppliers based on the event and type of interview are refined, validated and analysed. Figure 1 illustrates data acquisition channels and how they are classified and managed.

A total of 113 suppliers were contacted per email or/and per phone or/and in person. These extensive communications and associated activities are documented and kept confidential.

Figure 1: Data acquisition channels and data handling



2. Questionnaire development, distribution and statistics

As task 2.2 ''Suppliers ambitions and expectations'' was the starting point for further discussion with ITS/C-ITS suppliers, the existing questionnaire of task 2.2 was used as a basis and further developed for the activities in task 2.3. A set of questions were added to the questionnaire, based on the description of task 2.3 and the results of WP2 (D2.2). In addition, further improvements were made to the official invitation to make it more attractive, and some questions were adapted to add more focus to the interviews.

The new question and reformulated questions are shown below:

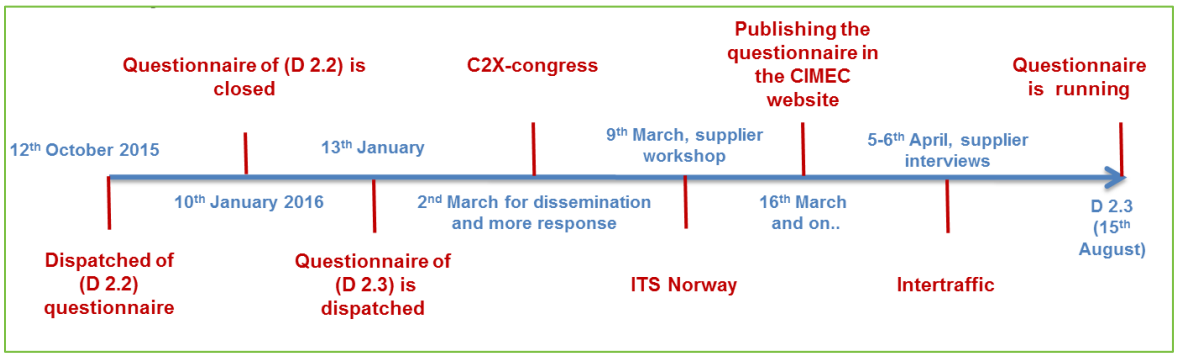
- In what C-ITS services - do you think - cities should actively engage/invest now (the first implies that its Benefit-Cost-Ratio is higher than the second and so on)? [open question 2.5, adapted from old question]
- Please identify briefly new possibilities made available through C-ITS - and alternative solutions provided by C-ITS [open question 3.3]

For further information about the questionnaire, please see annex 1.

The distribution of the questionnaire went through five phases, see figure 2 for visualisation:

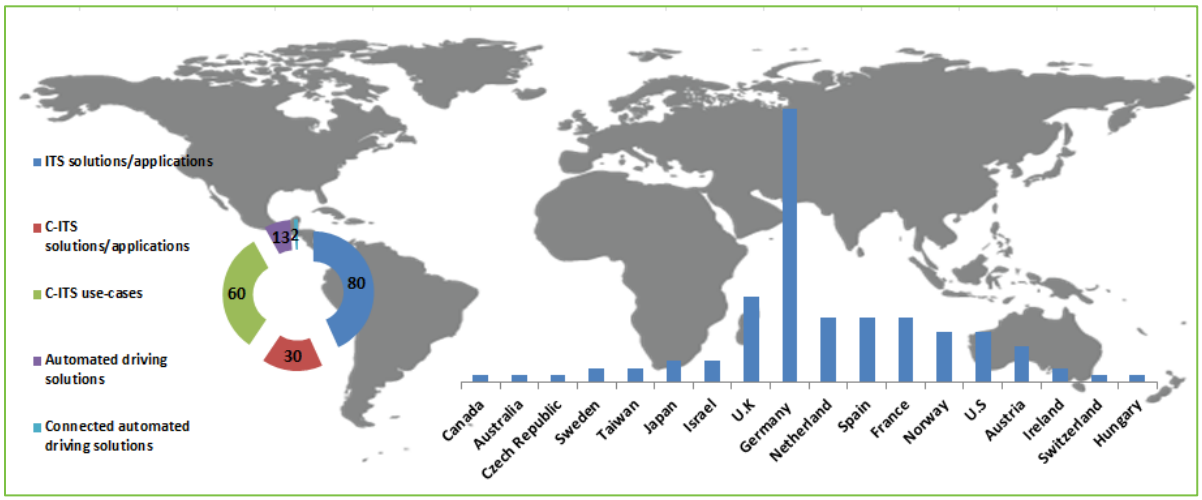
- Questionnaire was dispatched as online survey in January 2016,
- German suppliers were invited to participate in the questionnaire during a dissemination event (first German C2X-Congree in Frankfurt am Main - 2 March 2016),
- Supplier workshop session was conducted within the framework of ITS Norway-conference (9 March 2016)
- Link to the questionnaire was published on the CIMEC website in March 2016
- Face-to-face interviews were conducted with suppliers at the Intertraffic event in Amsterdam (5-6 April 2016).

Figure 2: Executive time plan for questionnaire distribution



Characteristics of the responding suppliers included in the database (D 2.1), are shown in figure 3. These include types of solutions they offer, and geographical representation. One third of the responses come from German suppliers, followed by suppliers from the UK, Netherlands, Spain, France and Norway.

Figure 3: Statistics about the suppliers and their types of solutions and services



3. Data collection, methodology and data analysis

The targeted population were all ITS-, C-ITS- and automated connected driving solution suppliers active in those fields in Europe. These suppliers offer different types of solutions and services such as complete systems, in-field/in-vehicle components, communication, software/applications and mobility services.

3.1 Data collection and validation

The questionnaire responses have been saved on the one hand automatically by the online questionnaire tool and documented manually during the suppliers' interviews.

The questionnaire has been validated with the consortium by means of internal discussion. For the task 2.2 questionnaire, this was carried out in two steps before publishing; the first one by ensuring that the questions in the survey will answer what the ambitions and expectations of C-ITS are, the second one by testing the consistency of the questionnaire, not only with the CIMEC objectives but also the city questionnaire (WP 1, task 1).

Furthermore, the responses have been validated by the following approach:

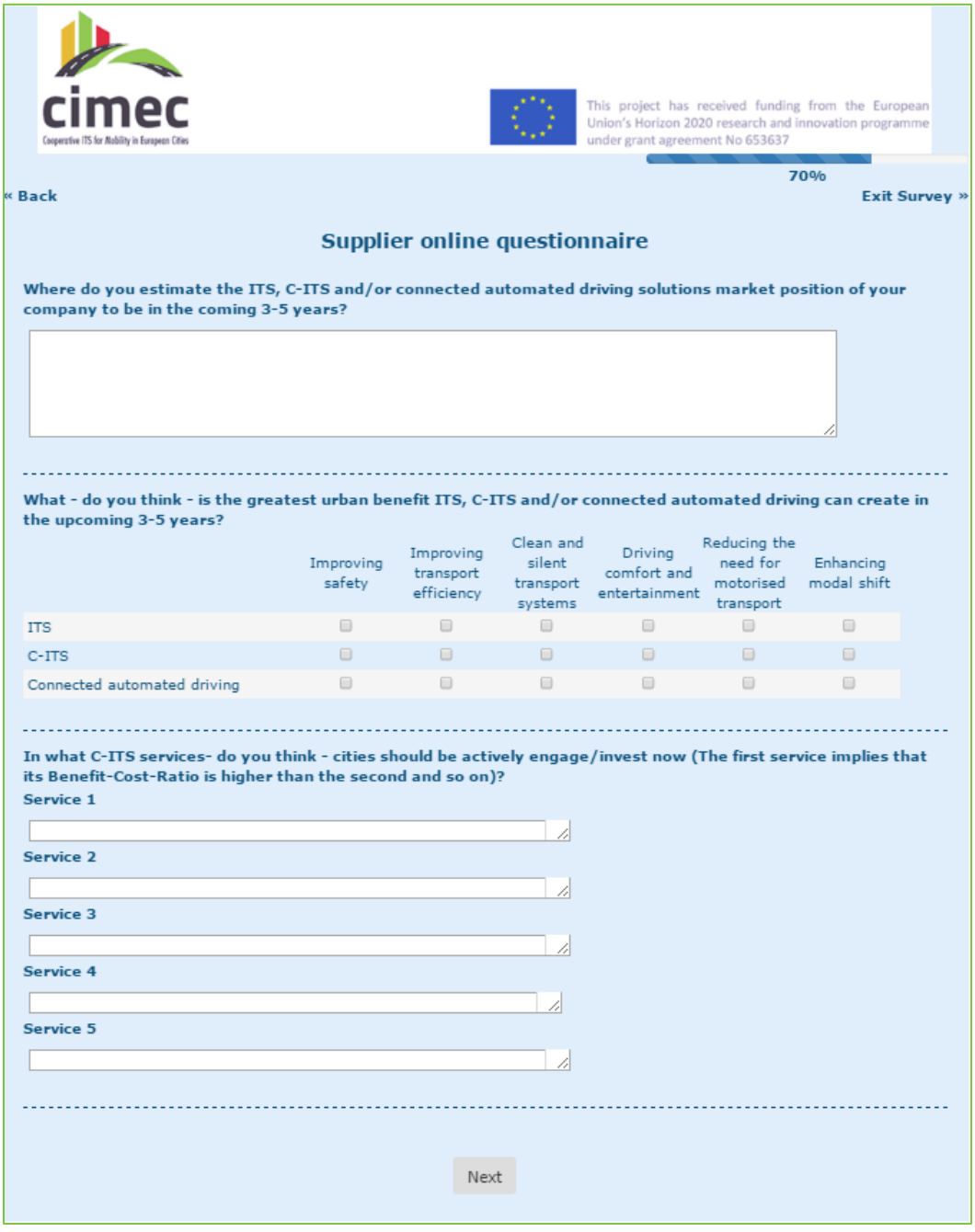
- only those questions that have been answered by most of the respondents have been analysed:
    - This is to avoid any bias in the results as far as possible,
- Non-response biases are highlighted, if one type of industry is over-represented compared to other stakeholders,
- consistency and relevant answers has been checked per respondent:
    - This is to avoid any response bias1 as far as possible,
    - Consistency has been further investigated based on the strategic ambitions of the supplier through their official website and the available database, when this was needed.
- consistency and relevant answers based upon the interviewing channel:
    - E.g. few companies answered the online questionnaire and were interviewed.

Challenge and opportunity had been experienced at the Intertraffic Amsterdam exhibition. The challenge when conducting face-to-face interviews was clearly how to cover important aspects, if not all, of the online questionnaire during interviews due to the time limitation. One opportunity was the possibility of receiving spontaneous responses to questions and capture verbal and non-verbal signs that are very useful to analyse data relevance and data quality. Most of the respondents are high-profile persons, e.g. managing directors and senior product managers.

[1] This was taken into consideration during the development of the questionnaire

To sum up, all questions were answered by suppliers and consistency of acquired data is experienced. Moreover, most of the responses are coming from the infrastructure industry and this shall be taken into consideration for the audience.

Figure 4: Snapshot of the distributed questionnaire



3.2 Methodology and data analysis

The data analysis followed the following process:

- Statistical analysis has been applied for closed-ended questions.
    - Interesting comments from some suppliers have been cited to enhance the results from the analysis
- Qualitative analysis has been used for open questions. Thematic analysis is used.
- Further analysis has been conducted by classifying suppliers and identifying, if any, different points of view (automotive, communication, etc.) with regard to main questions of this task.
- Conclusions have been drawn regarding supplier ambitions and expectations.

3.2.1 Rate, size of participation and supplier profile

The amount of data that was finally collected was adequate compared with that in (D2.2). It is therefore possible to come up with a clearer picture of the ambitions and expectations of suppliers.

As is shown in figure 5, 39 out of the 113 contacted ITS-, C-ITS-, connected automated driving solution suppliers participated in the task 2.3 survey. This is a response rate of 35 %, which should be considered a satisfactory result.

Figure 5: Size of participation

The geographical distribution of responses by country and region presented in figure 6 and 7. What is interesting - in line with the objective of identifying possible regional differences – is the second figure in which more than third of responses are middle Europe region's suppliers (German speaking countries), followed by the UK region, Southern Europe (Spain and Italy). Others countries who are out of the focus of CIMEC were grouped together, they represented 26 % of the total responses.

Figure 6: Supplier head-quarter

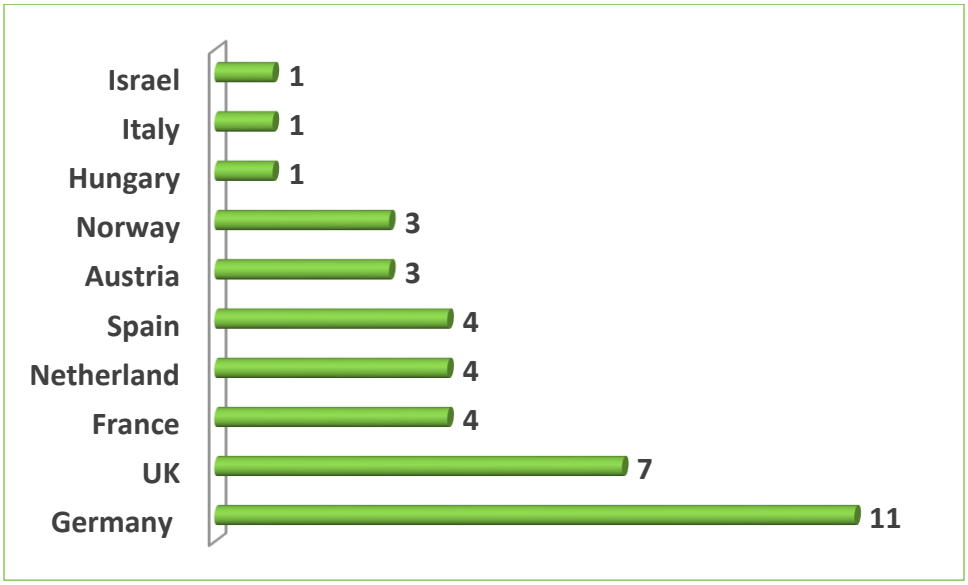


Figure 7: Geographical representation by region (N=39)

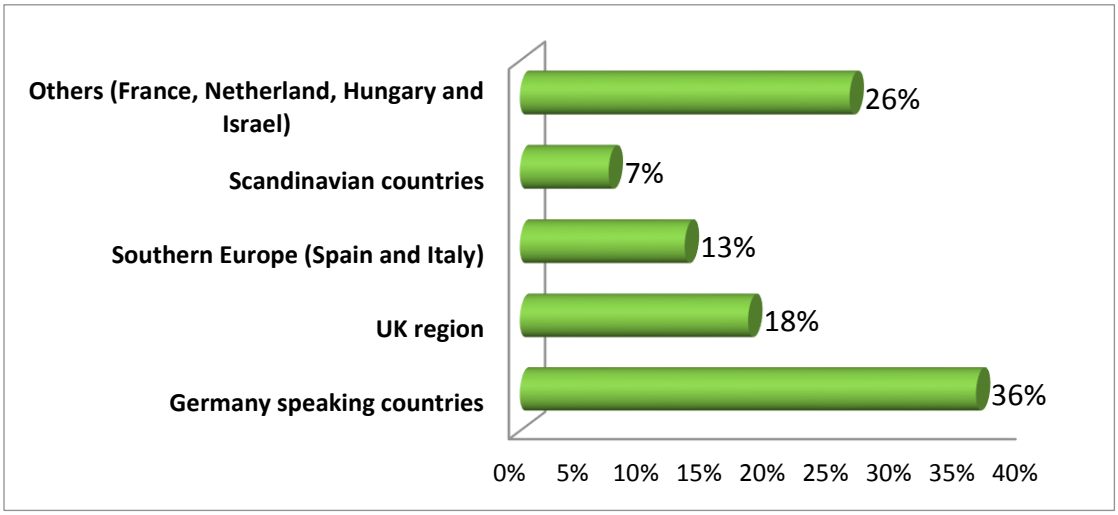
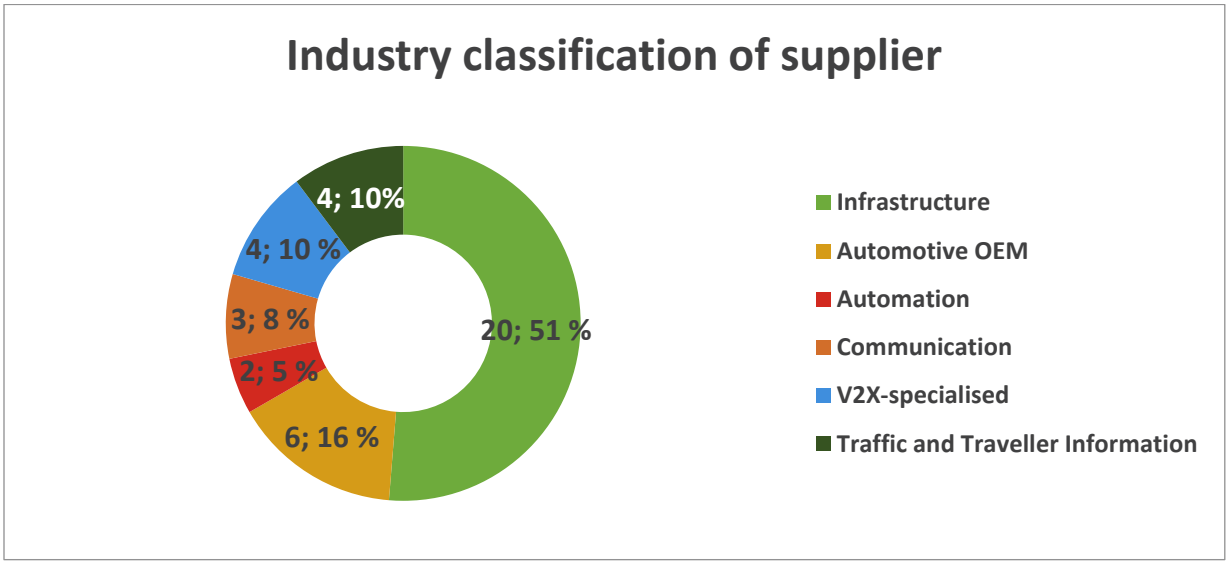


Figure 8: Industry classification of suppliers (N=39)



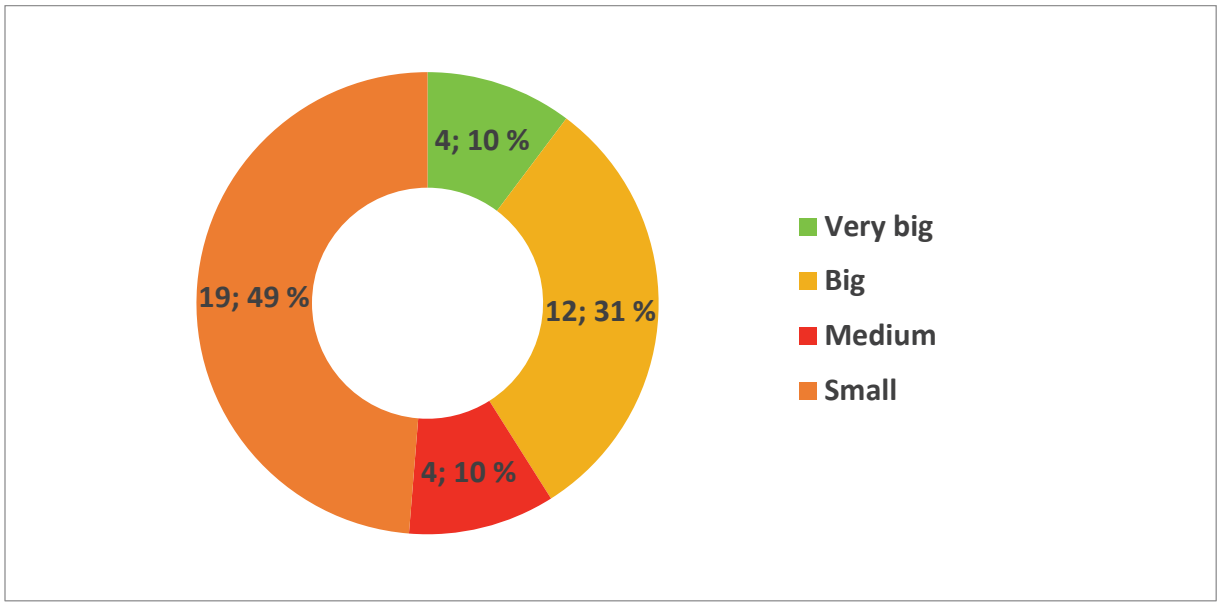
These suppliers are from different industry sectors, provide different solutions and have a different focus/interest. The suppliers are classified in 6 groups based on type of activity, as shown in figure 8;

- infrastructure-based suppliers who provide conventional ITS solutions such as traffic light controllers, ANPR, etc.,
- automotive Original Equipment Manufacturer (OEM),
- automation suppliers who provide automated, complete transport solutions,
- communication-based suppliers who provide communication modules with software or hardware,
- V2X-specialists are suppliers who focus mainly on cooperative solutions, components and products
- traffic and traveller information providers who work on acquiring data and providing services based on this, or who manufacture navigation systems, or both.

Half of the responses are coming from the infrastructure industry. The overall results are therefore impacted significantly by infrastructure suppliers' point of view.

The size of the supplier (see figure 9), has been roughly estimated due to the lack of required information. The estimation was based on number of employees, sales, number of departments with the company, or judgement on provided services which were documented in (D 2.1). Half of the responses come from suppliers estimated to be small companies.

Figure 9: Supplier size[2] (N=39)



3.3 Quantitative analysis

This section provides a presentation of statistical results from the analysis of the responses. The analysis is based on not only suppliers who answered the survey, but also suppliers that have been interviewed face-to-face.

- Question #1.2: To what extent is your company active in ITS, C-ITS and/or connected automated driving?

  The results in the following figures show that more than 50 % of suppliers who responded consider themselves to be very active in ITS (Figure 10) and C-ITS (Figure 11), while the share is 24 % in the case of connected automated driving (Figure 12). This percentage of C-ITS activity is reasonable since many suppliers engaged/engage in previous and current C-ITS pilot-projects.

  The percentage of suppliers active in C-ITS is relatively correlated to the ones in ITS. 5 % and 15 % of suppliers are currently not active in ITS and C-ITS respectively.

[2] Approximated as there is no enough information that is required for a better estimation

Figure 10: Respondents' level of activity in ITS (N=38)

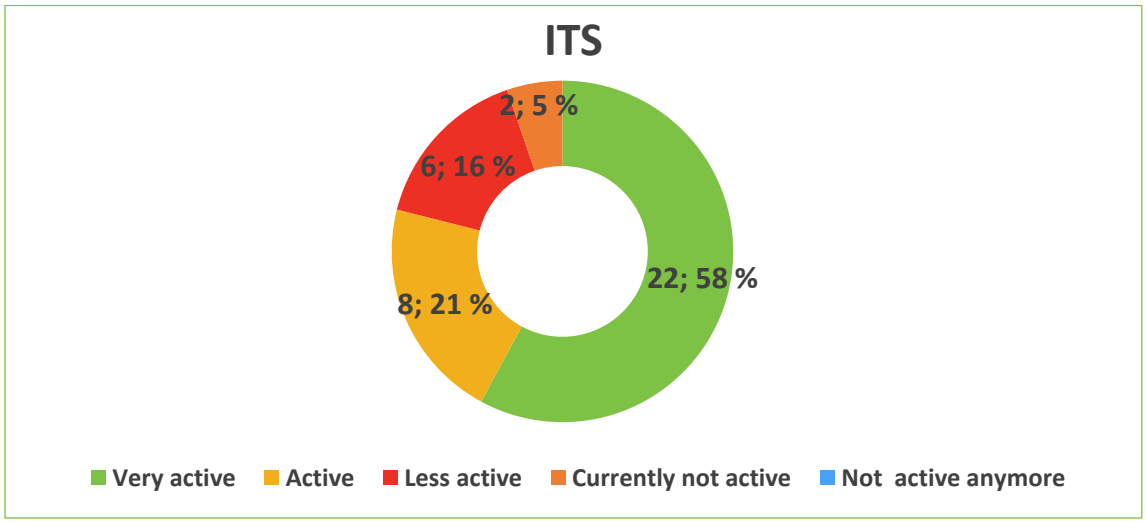


Figure 11: Respondents' level of activity in C-ITS (N=39)

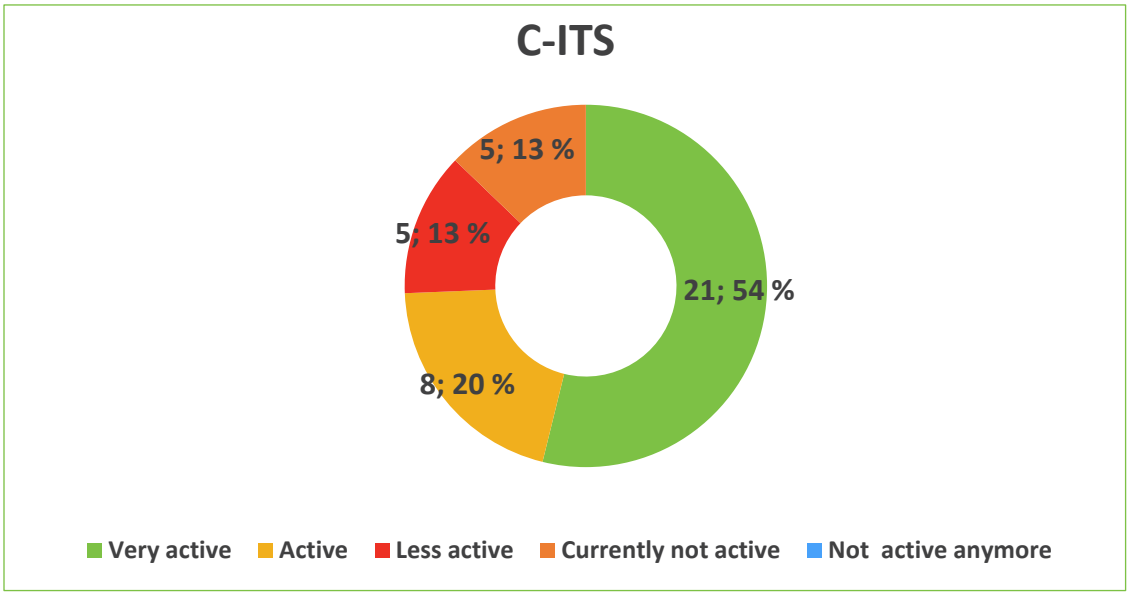
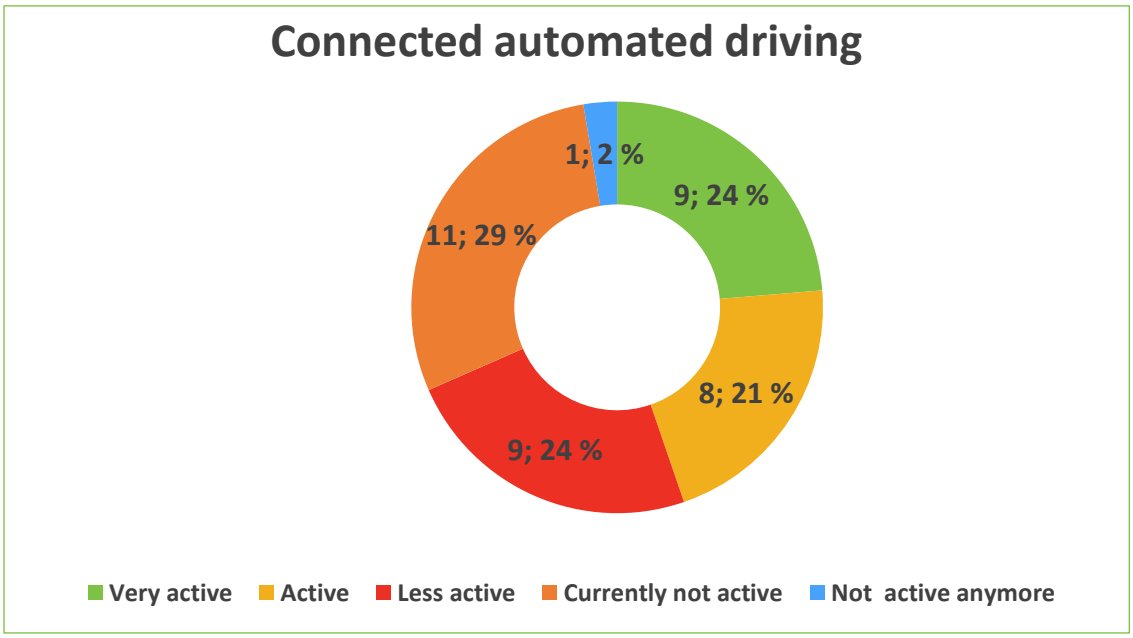


Figure 12: Respondents' level of activity in connected automated driving (N=38)



- Question #1.5: Would you please describe your company focus with regard to ITS, C-ITS as well as connected automated driving solutions (if any).

  This was a multi-response question answered by respondents indicating that they are *currently active* within the respective fields of technology.

  Most of the suppliers who focus on complete systems use ETSI ITS G5 technology, while the others who deliver other complementary products such as in-field sensors, communication modules and software solutions, do not focus on one single cooperative technology. The responses may indicate that mobility services attract less attention from suppliers in comparison with business areas such as software/ application, communication and in-field/in-vehicle components. It might be that complete systems and service mobility are what many public road authorities and thus cities are interested in, but every city has their own unique needs either as a software solution, in-field component or complete system.

  C-ITS suppliers (Figure 14) focus more on ETSI-ITS-G5 than cellular technologies for the complete systems. This may relate to the fact that ETSI-ITS-G5 is a standardised dedicated technology for vehicular and infrastructure communication, unlike cellular technologies 2G/3G/4G-Lte at the moment of writing this report.

Figure 13: Types of solutions (focus) of suppliers active in ITS (N=19)

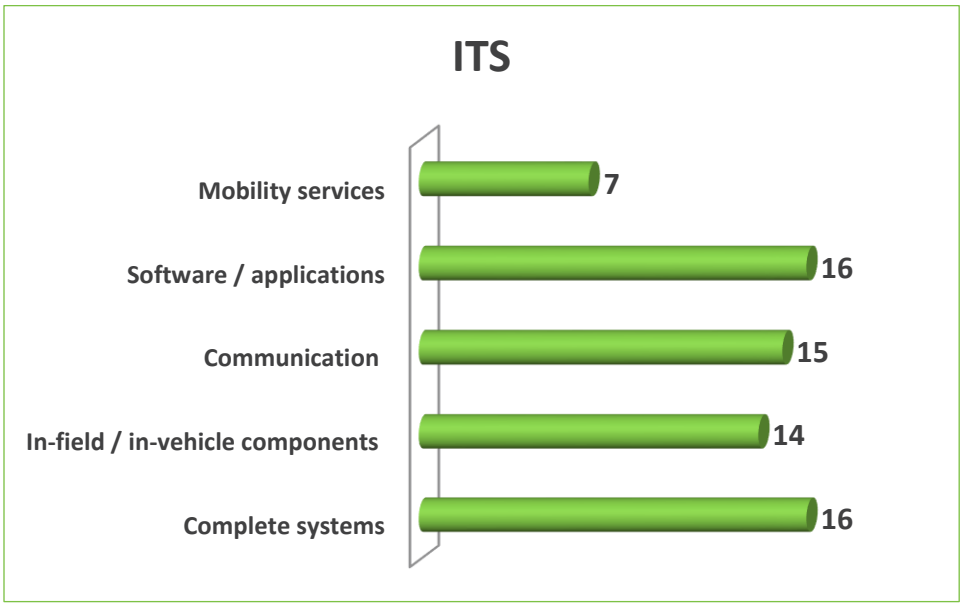


Figure 14: Types of solutions (focus) of suppliers active in C-ITS (N=15/17)

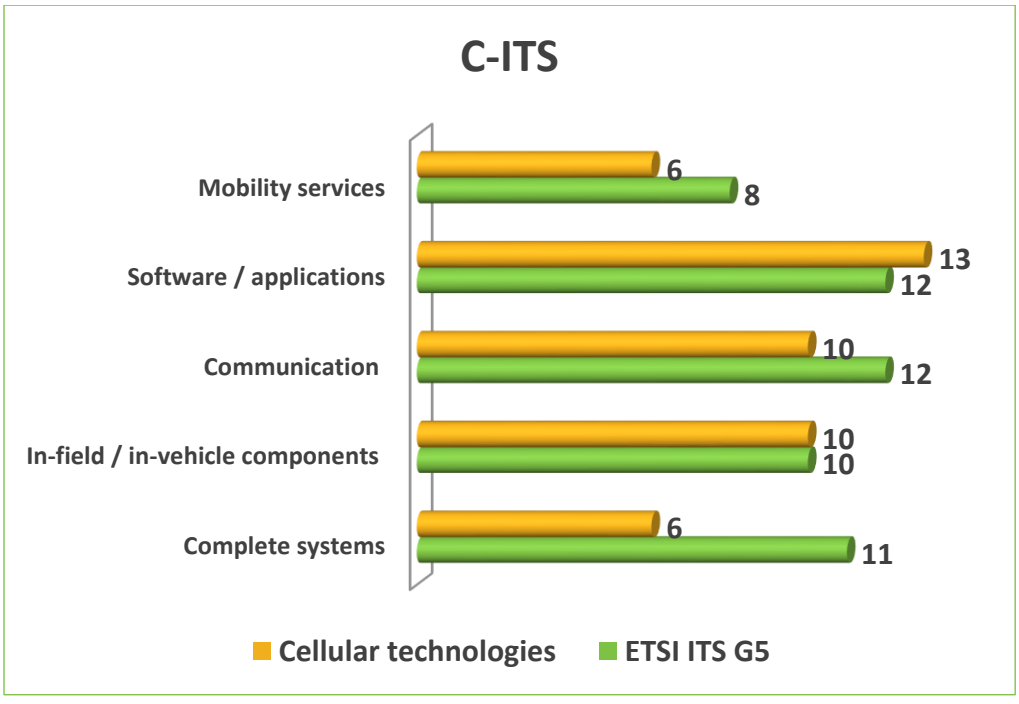
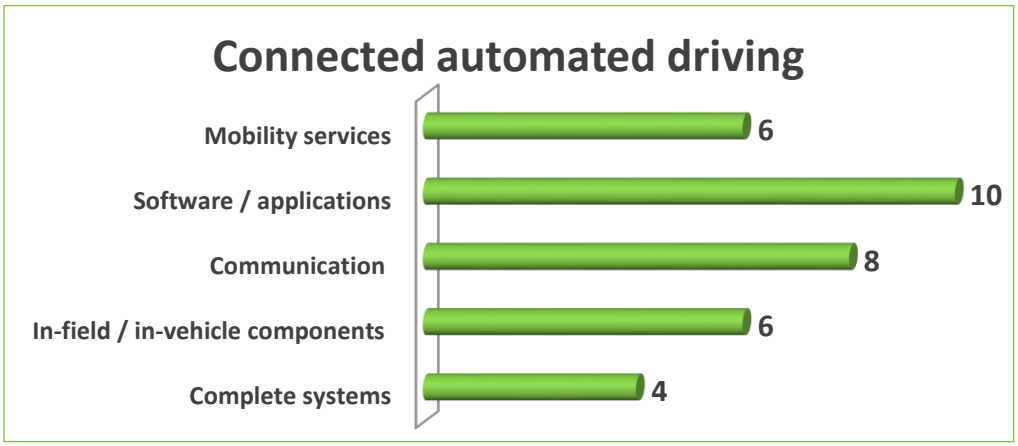


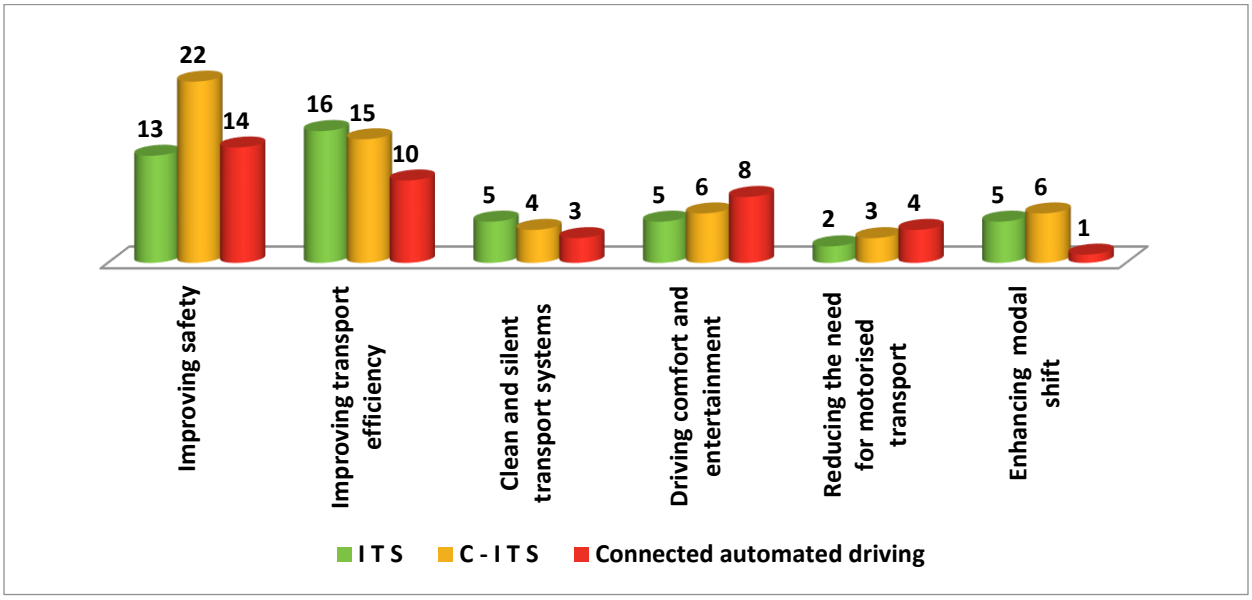
Figure 15: Types of solutions (focus) of suppliers active in connected automated driving (N=13)



- Question #2.4: What - do you think - is the greatest urban benefit ITS, C-ITS and/or connected automated driving can create in the upcoming 3-5 years?

  It can be seen that C-ITS solutions are expected to have a major impact on both improving safety and transport efficiently. This is the case shown in figure 16 for both ITS and connected automated driving, even though the safety potential of C-ITS is slightly more significant compared to the other two.

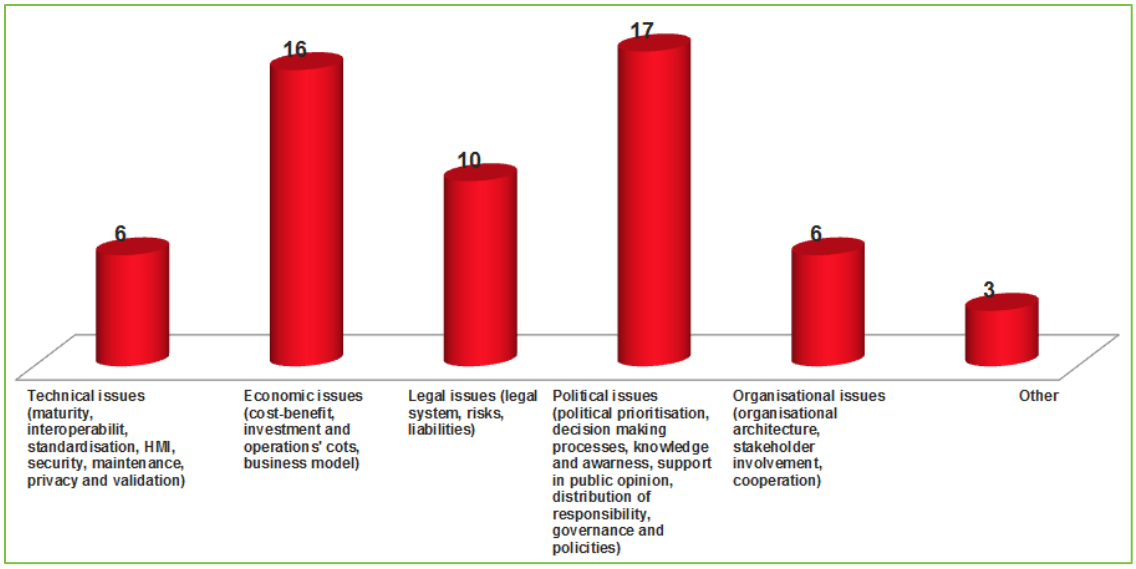
Figure 16: The benefits of ITS, C-ITS and connected automated driving from a supplier's perspective (N=39)



- Question #3.1: What do you consider the main barriers to integrating C-ITS solutions into existing ITS infrastructure in cities?

  The responses indicate that seen from the supplier side, the main barriers towards deploying C-ITS in the cities are *political issues* such as political prioritisation and *economic issues* such as lack of business case; the result is illustrated in the figure 17 below. More details on this can be found in the analysis of question 3.2 in section 3.4.

Figure 17: Barriers suppliers see towards deploying C-ITS in cities (N=36)



3.4 Qualitative analysis

This is an analysis of open-ended questions that most of the respondents answered. It has been be conducted per question as follows:

- Question #1.7-b: Could you please give more information about your company's C-ITS solution/product/component family (name and short description)? Number of respondents =25.

  This question reveals the actual capabilities of suppliers for delivering components, products, systems with regard to C-ITS. Table 1 below summarises current solutions/products/component that suppliers can offer. Some of the solutions presented raised further questions for clarification that were not answered as suppliers did not respond. Globally, it is worth noticing out of the table that the development of mature and effective solutions/products/component is ongoing and may take some time. As an example, one key supplier stated that it will be ready selling Cooperative-based

equipment by the end of 2016. In addition, there is ambiguous or irrelevance of some solutions indicated in the table which are:

1. Warning to drivers and intelligent junction: What is meant by intelligent junction,
2. Supporting C-ITS via infrastructure (ITS G5-based) and supporting systems that support connected & autonomous systems: What are supporting systems?
3. Partly GLOSA, crowd sourcing and many others: no further information on other solutions,
4. R-ITS-S R&D development platform for R-ITS-S or V-ITS-S: still in development phase,
5. Test-field for In-Vehicle Signage: it is not a product yet.

Table 1: Current solutions/products/components that suppliers can offer

# Supp-liers	Description of solution, product, component or service	Complete systems	In-field /In vehicle	Communi-cation	Software /application	Mobility services
1	Software services to find, book and pay for parking spaces in cities via Smartphone app. and in-vehicle software in cooperation with an automotive company					☑
1	Solutions for intersection in-vehicle signage for traffic lights and fleet management				☑	
1	''Warning to drivers and intelligent junction'', probably using cellular technology, could not to be verified!	☑	☑	☑	☑	☑
1	Supporting C-ITS via infrastructure (ITS G5-based) and supporting systems that support connected & autonomous systems	☑	☑	☑	☑	☑
1	Platform: one key supplier did not reveal any information, but its sister company stated that they made their platform a C-ITS enabled.	☑	☑	☑	☑	☑
1	- R-ITS-S - R&D development platform for R-ITS-S or V-ITS-S - V2X diagnostics tablet to capture, log, replay or analyse V2X life on site, Complete - Software stack conforms to ETSI Plug test ITS-CMS4 2015 with CAM BS, DEN BS, SPAT/MAP, LDM, BTP and GN		☑	☑		
1	Partly GLOSA, crowd sourcing and many others!	☑	☑	☑	☑	☑

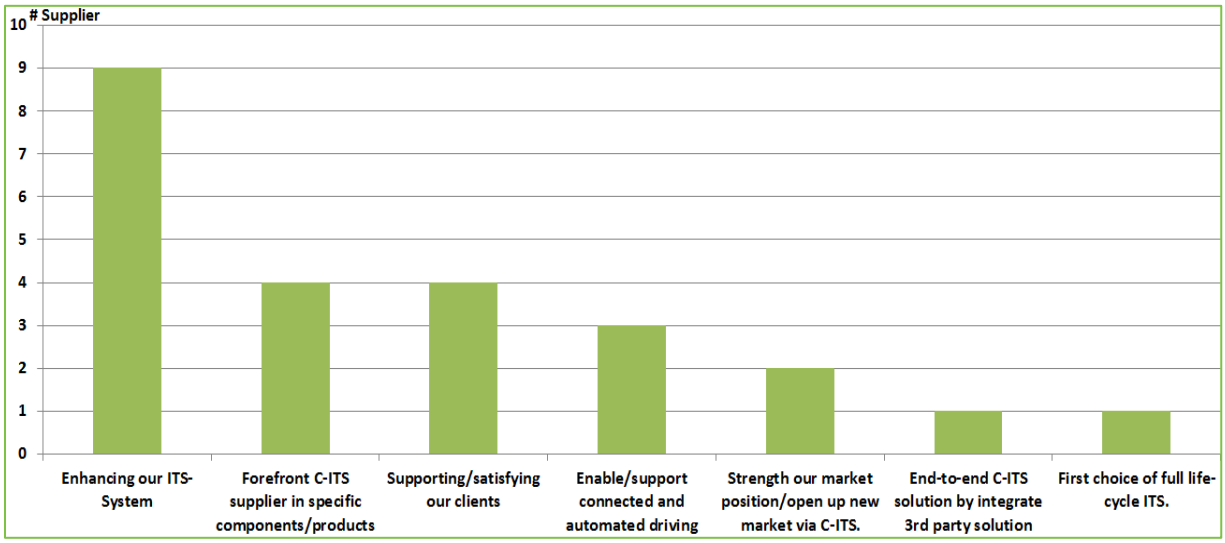
# Suppliers	Description of solution, product, component or service	Complete systems	In-field /In vehicle	Communication	Software /application	Mobility services
1	Complete system (sensors, V2X-enabler, application and services, maturity and readiness are of question!	☑	☑	☑	☑	☑
1	V2x-enabler soft- and hardware and possible applications!	☑	☑	☑	☑	☑
1	Our wireless sensing systems are used to provide real time information about outdoor parking availability and traffic	☑	☑	☑	☑	☑
1	Provide service such as prioritisation of public at intersections using radio modems for wireless data communication			☑		
1	Management module for Cooperative Systems and Communication Unit (R-ITS-S)		☑	☑		
1	Cloud-based distributed communication modem with application capabilities			☑		
1	Products deliver scalable communication software for telecommunications, transportation and the automotive market ready-to-use software solution supports US and European standards, solution is hardware agnostic!			☑	☑	
1	Software and methodologies for (cyber-) security and safety of connected automated driving				☑	
1	Automated Road Transport System with communication with traffic light, only if necessary!	☑	☑	☑	☑	☑
1	Implementation of ITS-G5 using software toolkits of other suppliers. Only in pilot-phase					
1	Test-field for In-Vehicle Signage					
1	Provides conformance testing					
1	Location-based Services and Data Content, Maps and Traffic			☑		
2	No solutions!					
3	No solutions yet!					

- Question #2.1: What are the principle ambitions of your company with regard to ITS, C-ITS and/or connected automated driving? Number of respondents = 37.

  Regardless of the type of industry the supplier belongs to, most of them see C-ITS as a potential for new and/or enhanced services. Suppliers are interested in C-ITS as a big opportunity; on the one hand to keep their existing clients satisfied (keep their own market position) by helping them realise this technology for the good (added value and new services), and on the other hand to open up a new market, and for a very few of them to enable connected automated driving. Quantifying the mainstream suppliers and their expectations, see figure 18, shows that the majority of suppliers who come from the traditional ITS-industry regard C-ITS an opportunity for enhancing their own systems and services.

  Based on their responses to this question, the participating suppliers can be grouped into three categories with respect to ambitions: One category looks for a long-term engagement or the involvement of a cooperative technological solution. The second category aims at entering the market through their comprehensive specific expertise in one single major product/product family (software, hardware, system or platform). The third category aims to become involved through their own products that complement/support cooperative technology to be realised. One fourth category will integrate C-ITS into their existing portfolio as an added-value service and perhaps new service, but when there is an established market and thus proof of business.

Figure 18: Supplier ambitions and expectations



- Question #2.2: Would you please outline your company's most significant ITS-, C-ITS- and/or connected automated driving activities (with regard to application, scale of activities, projects and partnership with both other suppliers and/or cities). Number of respondents = 36.

  Most of the suppliers stated that they participate in activities of initial deployment of C-ITS, either directly as a partner of relevant projects[3] or indirectly by supporting their client ''key-players who outsource some of their sub-services such as automotive suppliers''.

- Question #2.3: Where do you estimate the ITS, C-ITS and/or connected automated driving solutions market position of your company to be in the coming 3-5 years? Number of respondents = 29.

  The responses from the key suppliers from automotive and infrastructure sector indicated that they have a clear vision that they will be the frontrunner of connected car driving and a leading supplier of infrastructure-based C-ITS solutions respectively. For most of the other small- and medium-sized suppliers, the responses indicate that they have no clear view and no vision regarding this, due to the complexities and uncertainties of this disruptive technology, see the analysis of both question 3.1 (in section 3.3) and question 3.2 (below). It is therefore worth citing an interesting statement by one supplier, see below:

  '' [SUPPLIER NAME] has a strong position in the specialist data communications sector of the [COUNTRY NAME] ITS market and hopes to retain that. As POLIS recognizes, the defining characteristics of the C-ITS market are still to be defined: for example, what applications will be run? What business models will deliver those services? What are the technical requirements of the service delivery solutions? It is certainly going to be a very competitive market with organizations not traditionally associated with ITS entering the market. It is therefore impossible to state now what our market position will be in 3-5 years' time except to say that as [SUPPLIER NAME] already has (i) extensive existing roadside infrastructure; (ii) good working relationships with local authorities, freight operators and vehicle OEMs we feel well-placed to make an impact''

[3] Such as simTD, UR:BAN, C-ITS Corrdior (ECo-AT), Compass4D, e-Call, SCOOP@F, Converage, ANIKA, AKTIV, .etc.

- Question #2.5: In what C-ITS- and/or connected automated driving solutions - do you think - cities should be actively engage/invest now? Number of respondents = 30.

  The most important solutions that suppliers see with regard to urban context are those related to both the leverage of road safety at intersections, efficiency in managing traffic and the reliability of traffic information. The list of solutions/applications which are stated by the suppliers is:

    - Road hazard warnings (slow vehicle, shock wave, traffic jam, hazardous location notification (weather mainly) and signal violation),
    - In-vehicle signage (speed limit),
    - Parking (off- and on-street),
    - Vulnerable road user warning,
    - Prioritisation of Public Transport (PT),
    - Green Light Optimised Speed Advisory (GLOSA),
    - FCD (using all possible vehicles including public safety vehicles).

  Other specific recommended solutions are:

    - Parking management including P&R,
    - Information on Alternative Fuel Vehicle (AFV) fuelling & charging stations
    - Fleet management of city-owned vehicles including PT
    - Emission monitoring and FCD using public vehicles
    - Telematics insurance (Pay-As-You-Drive) or (Pay-As-You-Pollute)

- Question #3.2: Would you like to add more information to the previous question[4] (main barriers to integrating C-ITS solutions into the existing ITS infrastructure in cities)? Number of respondents = 8.

  Even though there is a consensus on the potential or expected benefits of C-ITS, deploying such a ''proper'' C-ITS solution has clearly a technical complexity (due to missing standards in cities, for instance) and because suppliers obviously require a profitable business case (ROI). Therefore, every supplier/actor is waiting and watching while being watched (“Penguin effect”). Starting first may ensure a minimum penetration rate (regardless of the type of ITS station) to gain the promised benefits.

[4] See question number 3.1 in section 3.3 for a statistical illustration of the responses regarding main significant barriers towards integrating C-ITS into existing ITS infrastructures

The responses indicate that one important aspect is the issue of data (privacy, security and liabilities), who owns the data/information, who is it shared with, how can it be understand properly, who is responsible for wrong warning and who owns the system etc. Another dimension of the challenges (barriers) is that cooperation (risk of loss or opportunity for gain) is needed to realise a cooperative service and this is very difficult due to the diverging interests of stakeholders.

- Question #3.3: Please identify briefly new possibilities made available through C-ITS - and alternative solutions provided by C-ITS, number of respondents = 8

  Even though C-ITS is a "small market'' today, it can disrupt/change the current business of ITS and open up a new value chain due to its potential of bringing what ITS cannot provide. In the supplier's point of view, C-ITS is going to improve safety for all road users, including VRU, optimise traffic flow and reduce traffic emissions.

  Furthermore, they expect new opportunities to arise from C-ITS as a connectivity-enabler for automated connected driving.

- Question #4.1: Do you have any comments or feedback on this questionnaire? Number of respondents = 10.

  Two respondents commented on the questionnaire/questions overall. One of them was about positive critics concerning clarity of the questions. This is logically the reason why this respondent did not answer a couple of questions, see quotation below.

  '' I think the questions are not clear enough''

  The other one reflected on the ambiguity of the C-ITS market as an emergent network industry. This comments confirms the long discussions among CIMEC partners into the scope of C-ITS terms of technical perspective (which technologies), business perspective (who are the targeted end-user), what cooperation means (stakeholders) and, last but not least, what is the use-cases that C-ITS is actually targeted, see quotation below.

  '' Thank you for the opportunity to comment. The questions were challenging, but reflect the general sentiment of everyone else currently active in C-ITS - there are no easy answers and no clear direction (yet)''.

4. Conclusion

Before concluding, it makes sense to categorize suppliers in four main groups:

The first is called the key suppliers. There are very few of these as they have a significant impact on the market and therefore C-ITS. This category is divided into two sub-groups; automotive-based supplier and infrastructure-based suppliers.

The second group are small active suppliers who are actually working for key suppliers, the first category, and adjust their goals and ambitions accordingly since their business depends heavily on the strategic decision of other suppliers. They too have specific ambitions such as:

- worldwide V2X equipment supplier with concrete numbers,
- hybrid secure application platform for V2X,
- independent recognized tester and certifier.

The third group is passive suppliers, the mainstream ITS suppliers, who are interested in the C-ITS, but are waiting for a key player to deploy such a solution and before entering this market. This category is risk-averse to the new technology and would join in the game when there is an established market and thus proof of business.

The fourth group is specific suppliers who are more technologically oriented. These suppliers provide specific technologies which are needed by other suppliers, e.g. positioning technologies and RSU chip set producers.

Regardless of the type of supplier, most of them see C-ITS as a technological potential, on the one hand to improve the existing ITS-services (added-value services) and on the other to enable new services such as intersection safety warning against vulnerable road users (VRU) and near future of connected automated driving. Either they don't want to risk their existing, successful ITS business and/or they are waiting for key suppliers to act.

The deployment barriers that have been identified by suppliers are mainly economic and political; economic because there is no concrete business case behind them and expected benefits, political since there is an uncertainty about cooperative systems such as privacy liability, though this goes even further to the cities' lack of investment capacity.

APPENDIX 1: SUPPLIER ONLINE QUESTIONNAIRE

C-ITS – Cooperative Intelligent Transport Systems in urban areas

Cooperative systems – in which there is real-time data exchange between vehicle systems and local authority systems, either centrally or at the roadside - have the potential to support and improve the management of urban transport systems. By definition, local authorities are key players in the deployment of cooperative systems.

Numerous R&D projects have shown that cooperative systems work at a technical level, but they have yet to prove how they can contribute to policy objectives and/or cost-effectiveness in urban environments. This is a significant barrier towards a greater use of cooperative systems.

Dear Supplier,

You are cordially invited to participate in our questionnaire that is one of the main activities of the **European project "CIMEC – C-ITS for Mobility in European Cities"** aimed at supporting both cities and suppliers in the implementation of **C-ITS solutions in European cities**.

This will be achieved by:

- raising awareness amongst city decision makers for possible urban C-ITS solutions and their potential benefits for the cities, and
- bringing city stakeholders together with current and potential suppliers, thus fostering discussion and cooperation in the C-ITS area
- developing, validating and publishing a roadmap for the roll-out of C-ITS solutions suited to European Cities

One major goal of the CIMEC project is to collate and understand not only established urban ITS suppliers, but also C-ITS suppliers, who may be more familiar with customers in highways management or vehicle telematics. The roll-out of C-ITS solutions will only gain momentum if both sides – cities with their politicians and decision makers, as well as suppliers with their managers and engineers – are able to start an substantive information exchange about the cities' needs and what suppliers – in terms of C-ITS - are able to offer to solve the problems.

To initiate this process, we are collecting information from both key cities and key suppliers around Europe. The resulting information will be collated in two reports, one on city requirements and one on supplier expectations for products/services. In the supplier report, all information will be anonymised by default.

WHAT DO WE EXPECT FROM YOU?

- To foster this information exchange, we kindly ask you as a supplier to complete and return the following questionnaire concerning your ambitions and expectations in the field of urban C-ITS.

WHAT WILL WE RETURN TO YOU?

- We will share with you what we learn from this supplier questionnaire, documented in an anonymized report.
- We will invite you to one of 4 regional suppliers' workshops, in which we will bring suppliers together to discuss cities' challenges with respect to potential C-ITS solutions.
- We will share with you what we learn about cities' evolving expectations, hopes, needs and requirements.
- We will share the draft urban C-ITS road map, with recommendations for the European Commission on how to support C-ITS for urban areas, for your review and comment.

LOGISTIC

In this questionnaire, more than 90 ITS, C-ITS and connected automated vehicle solutions suppliers (either European or non-European active in Europe) will be asked to complete a survey that asks questions about supplier ambitions and expectations with regard to C-ITS as well as connected automated vehicle solutions in the URBAN CONTEXT. It will take approximately 10 to 20 minutes to complete the questionnaire. It is very important for us to have your valued contribution that could make all the difference.

Your questionnaire responses will be strictly confidential and data from this research will be reported only in the aggregate. If you have questions at any time about the questionnaire or the procedures, please contact Mr. Osama Al-Gazali via his email address [osama.al-gazali@albrechtconsult.com]. Notice that the sign (*) indicates compulsory question and the sign (?) is hints in case a question is unclear!

Thank you very much in advance for your time and support. Please start with the survey now by clicking on **NEXT**/Link **button** below.

Supplier Questionnaire

<table>
<tr><th colspan="2">1. General information</th><th></th></tr>
<tr><td>1.1</td><td>Please give us some general information about yourself and your company</td><td>▪ Name of respondent: XXX XXX
▪ Core competence: XXX XXX
▪ Role/responsibility: XXXXXX
▪ Email-address: XXXXX@XXXX.XX
▪ Company: XXXXXX
▪ Unit/division/department: XXXX/XXX/XX
▪ Country: XXX XXX
▪ Head quarter: XXX XXX
▪ Business focus: XXXXXX</td></tr>
<tr><td>1.2</td><td>To what degree is your company active in ITS, C-ITS and connected automated vehicle solutions*? [please tick all that apply]
(*) Automated vehicle does not mean only full automated driving. It is also regardless of car type (public transport and private car both passenger car and trucks)</td><td>
<table>
<tr><td></td><td>Very active</td><td>Active</td><td>Less active</td><td>currently Not active</td><td>Not active anymore</td></tr>
<tr><td>ITS</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td>C-ITS</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr>
<tr><td>connected automated driving</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr>
</table>
</td></tr>
<tr><td>1.3</td><td>If your answer to question 1.2 is 9 or 10: please explain why your company is not active?</td><td>Free text: ……..</td></tr>
<tr><td>1.4</td><td>If your answer to question 1.2 is 4,5,14 or 15: Could you please elaborate briefly why your company is not active?</td><td>Go to thanks page.</td></tr>
<tr><td>1.5</td><td>If your answer to question 1.2 is 1, 2, 3, 6, 7,8, 11, 12 or 13:
Would you please describe your company focus with regard to ITS, C-ITS as well as connected automated vehicle solutions (if any)? [please tick all that apply]</td><td>A. Intelligent Transportation Systems (ITS)
a. Complete systems
b. In-field/in-vehicle components
c. Communication
d. Software/applications
e. Mobility services
B. Cooperative-Intelligent Transportation Systems - ETSI ITS G5 or 802.11p-based
a. Complete systems
b. In-field/in-vehicle components
c. Communication
d. Software/applications
e. Mobility services
C. Cooperative-Intelligent Transportation Systems - 3G/4G (LTE-based)
a. Complete systems</td></tr>
</table>

		b. In-field/in-vehicle components c. Communication d. Software/applications e. Mobility services D. Connected automated vehicle driving a. Complete systems b. In-field/in-vehicle components c. Communication d. Software/applications e. Mobility services
1.6	Would you please elaborate more on previous question?	Free text: ……
1.7	Would you please name ITS, C-ITS and/or connected automated driving products/solutions or applications that your company offer?	Free text: ITS …… C-ITS …… Connected automated driving ……
2.	**Ambitions, initiatives and expectations with regard to C-ITS and Connected Automated Driving Solutions**	
2.1	What are the principle ambitions of your company with regard to C-ITS and/or connected automated driving solutions?	Free text: …….
2.2	Would you please outline your company's most significant ITS, C-ITS and/or connected automated driving activities (with regard to application, scale of activities, projects and partnership with both other suppliers and/or cities)?	Free text: ……
2.3	Where do you estimate the ITS, C-ITS and/or connected automated driving solutions market position of your company to be in the coming 3-5 years?	Free text: …….
2.4	What do you think is the greatest urban benefit C-ITS and or connected automated driving can create within 3-5 years?	1. Improving safety 2. Improving transport efficiency 3. Clean and silent transport systems 4. Driving comfort and entertainment 5. Reducing the need for motorised transport 6. Reducing modal shift
2.5	In what C-ITS services - do you think - cities should actively engage/invest now (the first	Free text: …….

	implies that its Benefit-Cost-Ratio is higher than the second and so on)?	

3.	**Challenges and opportunities**	
3.1	What do you consider the main barriers to integrating C-ITS and/or connected automated vehicle solution into existing ITS infrastructures in cities? [please tick a maximum of 3 answers]	1 Technical issues (maturity, interoperability, standardisation, HMI, security, maintenance, privacy, validation) 2 Economic issues (cost-benefit, investments and operations costs, business models) 3 Legal issues (legal system, risks, liabilities) 4 Political issues (political prioritisation, decision making processes, knowledge and awareness, support in public opinion, distribution of responsibility, governance and policies) 5 Organisational issues (organisational architecture, stakeholder involvement, cooperation) 6 Other issues, please specify: ……..
3.2	Would you like to elaborate more on previous question?	Free text: ……
3.3	Please identify briefly new possibilities made available through C-ITS - and alternative solutions provided by C-ITS.	Free text: ……
4.	**Comments and feedback**	
4.1	Do you have any comments or feedback on this questionnaire?	Free text: ……

Thank you for your participation; we will send you the result of the questionnaire soon!

APPENDIX 2: ITS NORWAY-CONGRESS

Overview of ITS Norway-congress

ITS Norway conference is a national event in intelligent transport systems that is organized annually by ITS Norway and was held in Trondheim on 8-9 March 2016. This event attracted more than a 100 delegates and participants. The main topics for the conference are oriented to the topics that are of great interest at the national level and European level such as trends in technology, development and cooperation, innovative ITS – smart mobility and smart ITS, policy and trends, open data and specifications, safety and security.

Agenda of the workshop session

The workshop session aims at exploring supplier visions and expectations from a technological and commercial point of view, the deployment of C-ITS services taking into account city needs and requirements.

The outcome will be summarized as a input for developing a realistic roadmap for the deployment of C-ITS in the city environment taking into account the goals and constraints of cities; a common view and the expectations of supplier solutions are documented in the upcoming deliverable (D 2.3), see drafted agenda.

Protocol

On the 9th of March 2016, morning session, AC attended the ITS Norway-congress and introduced the CIMEC project in the form of a presentation[5] under the title ''Cooperative-ITS Services from city and supplier perspective: First results of horizon 2020 – CIMEC project''. At the end of the presentation, and on behalf of CIMEC, AC invited all suppliers to take part in the supplier session in the afternoon.

In the afternoon session, a short presentation of the working package was introduced to participating suppliers. After that, suppliers were invited to fill in the survey. Finally, open discussions were moderated by AC with regard to the survey and the challenges of C-ITS in cities that suppliers see and how to overcome them.

Participants

Flemming Sveen	Managing director	Online.no
Bjørn Elnes	System engineer	Aventi Technology AS

[5] This presentation and other supporting documents are attached to this report

Trond Hovland	ITS Norway on behalf of Triona

In addition the following representatives were present:

Solveig Meland	SINTEF (The Foundation of Scientific and Industrial Research)
Hans Westerheim	SINTEF (The Foundation of Scientific and Industrial Research)
Per Einar Pedersli	NRPA (Norwegian Public Road Administration)
Hanfried Albrecht	AC (AlbrechtConsult GmbH)
Osama Al-Gazali	AC (AlbrechtConsult GmbH)
Mark Cartwright	CC (Centaur Consulting Ltd)

APPENDIX 3: INTERTRAFFIC AMSTERDAM

Overview of Intertraffic Amsterdam

''The Intertraffic Amsterdam exhibition is the largest and most prominent innovation platform in Europe for (sustainable) mobility solutions and products & services in the field of infrastructure, traffic management, safety and parking. Intertraffic Amsterdam is the key meeting platform, market place and knowledge centre for businesses and traffic professionals worldwide. With approximately 800 exhibitors from 42 countries, an extensive knowledge programme and commitment from all stakeholders, Intertraffic Amsterdam is the leading global biennial trade fair for the traffic industry. The show covers more than 56,000 square metres of exhibition space and welcomes 25,000+ visiting professionals representing 128 nationalities'' [http://www.intertraffic.com/].

The Intertraffic Amsterdam exhibition will be held in Amsterdam on 5-8 April 2016. This event focuses on the state of art-and practice in the field of ITS from infrastructure perspective. It is planned to target suppliers who neither answered the supplier questionnaire, were interviewed, nor participated in the interactive workshop in Trondheim.

This event is dedicated to infrastructure suppliers and therefore more attention to other types of suppliers is necessary, such as automotive suppliers.

Activities overview

Attending the event and having direct face-to-face interviews with targeted ITS/C-ITS and partly automated and connected suppliers are the main activities. This event will be the last event that is planned with regard to task 2.3. Attending the event, for 2 days (on the 5th and 6th of April 2016), aims to complete the results of previous events and interviews.

The interviews will address the supplier vision and expectations from a technological and commercial point of view, the deployment of C-ITS services, taking into account city needs and requirements. Eventually, a common view and expectation of supplier solutions will be documented in the upcoming deliverable (D 2.3).

It is worth noting that the targeted suppliers are chosen due to the relevance and geographical representation.

Protocol

On the 5th and 6th of April, AC, on behalf of CIMEC, attended the event with a targeted list of suppliers who either did not fill in the complete online questionnaire, or who did not answer. In addition, new suppliers are reached and interviewed.

The open-ended questions of the developed questionnaire are considered as the core of the discussion. The evolution of interview and the level of details depend on the interviewee's responsiveness. The average duration of the interview is around 20 minutes.

This type of interview (supplier) provides the opportunity to gain the full attention of suppliers and discuss the questions in a convenient mode to talk. 14 suppliers from different ITS industries are interviewed with the support of some partners, see the list of participation.

Participants

Osama Al-Gazali	AC (AlbrechtConsult GmbH)
Tilo Voigt	AC (AlbrechtConsult GmbH)
Bernd Noll	City of Kassel (supportive partner)
Dr. Thorsten Miltner	City of Kassel (supportive partner)
Silvia Murga	MLC-ITS Euskadi (supportive partner)

APPENDIX 4: ABBREVIATIONS

Term	Meaning
V2X	Vehicle to Infrastructure communication
ANPR	Automatic Number Plate Recognition
e-Call	Is a European initiative intended to bring rapid assistance to motorists involved in a collision anywhere in the EU
OEM	Original Equipment Manufacturer
GLOSA	Green Light Optimised Speed Advisory