# Final project report

CIMEC deliverable D5.3

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cimec

Cooperative ITS for Mobility in European Cities

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# EXECUTIVE SUMMARY

## CONTEXT AND OBJECTIVES

CIMEC is a city-focused project which explored the role that cooperative ITS systems (C-ITS) can play to support city authorities in managing their transport networks and the delivery of other transport-linked services.

The deployment of C-ITS in cities has not kept pace with the technological development, implying that deployment is being restrained by non-technical factors. CIMEC, as a CSA for this topic, aimed to support the accelerated take-up of C-ITS by increasing the alignment of technological solutions with user needs, thereby removing perceived barriers and risks in deployment.

European highways authorities are relatively well educated, prepared and supported regarding C-ITS, including through a series of EC- and nationally funded R&D projects. However the greatest benefits are expected through the more complex and fragmented city context, which up to now has been much less understood. CIMEC has focused especially on this urban C-ITS context.

CIMEC brought together key collaborative institutions, supported by a panel of core cities and by the European city network Polis. This meta-network has extensive experience in bringing together cities and suppliers to optimise ITS, and has specific expertise in a range of C-ITS at national and European level.

CIMEC has reached out to key stakeholder groups (both public and private) in cities around Europe, and has engaged with and reached out to traffic system suppliers, large and small, in order to explore the potential for a rich and open market place for urban C-ITS.

The objectives of CIMEC were to:

- capture and document a set of realistic use cases for C-ITS in cities, supported by robust business cases
- identify practical project structures which enable the deployment of these use cases
- identify how emerging standards for C-ITS will affect, and should respond to, urban systems and processes
- show possible system architecture and workflow of C-ITS support systems
- promote multi-sector stakeholder dialogue, engagement and collaboration

The principal output from CIMEC is a Roadmap for city deployment of C-ITS which has been validated against user needs and technology maturity, captured in meaningful project descriptions. By developing a single, coherent narrative and communicating it effectively to all relevant stakeholder groups, this will ensure that standards, product development, project management, and policy goals are fully aligned across the European urban C-ITS context.

## WORK PERFORMED

Dialogue with local authorities, agencies and stakeholders and engagement with suppliers and other C-ITS stakeholders have been the main activities during the first year of the CIMEC project.

A combination of online surveys and local and regional workshops was used to engage with authorities and stakeholders in cities across Europe. Findings from the surveys were used as the input for the workshop discussions.

The four partner cities Bilbao (ES), Kassel (DE), Reading (UK) and Trondheim (NO) hosted two workshops each during the first three months of 2016, with a total of 108 participants representing a wide range of stakeholders in European cities:

- A local workshop aiming at a broad representation of stakeholders either having an interest in traffic management and use of ITS/C-ITS, or being affected by problems in the city road network and shortcomings in managing these which could potentially be improved by implementation and deployment of new technology in the city roads. Participants included representatives of transport and planning authorities, public transport and freight operators, emergency services, logistics trade union and chamber of commerce.
- A regional workshop involving participants from a wide range of small/medium sized cities within the region, focusing on the deployment of ITS/C-ITS in cities, challenges, requirements and barriers related to this.

A wide range of city-relevant Use Cases for C-ITS was identified through these surveys and workshops. These Use Cases were based on information about the cities' transport-related challenges and strategies, as well as the prevalence of ITS applications, plans, requirements and barriers for further deployment of C-ITS.

To enhance the city participation beyond the workshops organised by the CIMEC city partners, the CIMEC City Pool was established as a forum to enable a wider gathering of input from cities on urban transport needs and requirements and opportunities for C-ITS deployment. During the project lifetime, three City Pool workshops have been held (London, March 2016; Barcelona, November 2016; Brussels, May 2017). The two first workshops were joint events with the CODECS project, and back-to-back with events of other H2020 projects, ensuring broad participation from a wide range of cities and

stakeholders. The City Pool workshops have drawn participants representing 38 distinct local authorities (excluding partners) from 14 different countries.

A supplier database has been established, comprising large ITS suppliers identified through the consortium, as well as small and medium sized suppliers identified by the participants in the online city surveys. These suppliers and other C-ITS stakeholders have been approached by means of an online survey, workshops and personal interviews, to collect information about emerging C-ITS products, the supplier's views on benefits for cities and commercial expectations. Requirements for new/extended standards for were explored in a dedicated workshop.

The work on user needs and on supplier offerings has been brought together in activities aiming at developing a realistic, constructive and practical Roadmap for C-ITS in the urban area. The major part of this work has been carried out during the second year of the project. This work built on a review of existing Roadmaps - both the theory and how they have been applied to C-ITS historically - and participation in both the city- and supplier-related activities to ensure that the parallel information gathering processes would be as well aligned to the project goal as possible. The Roadmap for city deployment of C-ITS has been validated against user needs and technology maturity by CIMEC partners as well as city authorities and stakeholders taking part in the early CIMEC workshops and surveys. A draft version of the Roadmap was the topic of separate workshops in each of the four CIMEC partner's cities, and the final version was further discussed in the final City Pool workshop.

The main CIMEC findings and events and all public CIMEC deliverables have been published on the CIMEC web site. The CIMEC Newsletter has been distributed by email to a large number of representatives of city authorities, stakeholders and suppliers participating in surveys and workshops conducted in the project, and through the local, national and Europe-wide networks of the CIMEC partners. The findings and outputs of CIMEC have been brought into the European policy and deployment arenas such as the EC C-ITS Deployment Platform - Urban WG, CEN and ETSI standardisation committees, the Amsterdam group, H2020 and CEF projects, etc. All CIMEC partners have identified actions further exploitation of the CIMEC findings and outcome.

## PROGRESS BEYOND STATE-OF-THE-ART

Through city-focused multi-sector stakeholder discussions and processes, the CIMEC project activities have contributed to raising awareness and providing a basis for better understanding of the challenges, enablers and barriers and strategies for use of C-ITS solutions in European cities. This knowledge contributes to bridging the gap between C-ITS development and deployment in cities.

The 'Roadmap for deployment of C-ITS in European cities' is the principal output of the CIMEC activities. This Roadmap brings together key outputs of the early CIMEC project activities, including city

requirements for C-ITS, main barriers and how these can be overcome, a set of realistic use cases for urban C-ITS, as well as outline business cases and an overview of anticipated market developments of C-ITS. The Roadmap further provides recommendations for cities on how to approach implementation of C-ITS infrastructure, and for national and European policymakers on actions which could help to ease issues which constraints the cities in their effort to deploy C-ITS. The latter includes development of an evidence base for proven benefits of urban C-ITS, clarification of legal aspects related to urban C-ITS services and solutions, and provision of support mechanisms for the uptake of C-ITS in cities; both finding and technical advice on good practice regarding implementation.

The CIMEC Roadmap for city deployment of C-ITS is the first of its kind dedicated to conveying the "the voice of the cities" into the arena of C-ITS.

## CIMEC AT A GLANCE

The CIMEC project (Cooperative ITS for Mobility in European Cities) is supported by the European Commission under the Horizon 2020 research and innovation programme. The project is a Coordination and Support Action, commencing in June 2015 and running until May 2017.

Four of the eight project partners represented cities directly, from different parts of Europe: Bilbao (Spain), Kassel (Germany), Trondheim (Norway) and Reading (United Kingdom). In addition, five of the partners represent multiplier organisations, enabling connection with regional, national and international city-networks; POLIS (Europe-wide), AlbrechtConsult and Centaur Consulting (national in Germany (OCA) and the UK (UTMC) respectively), MLC-ITS Euskadi (Basque Country), and the National Public Roads Administration (NPRA) (responsible for the main road network in Norwegian cities). NPRA also provided links to national roads authorities in other European countries. The project was coordinated by SINTEF (Norway).

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# 1. Project context and objectives

CIMEC was created to support the efforts by the European Commission in accelerating the take-up of cooperative systems and associated legal, organisational, technical and standardisation issues. Within this context, the specific focus of CIMEC was to present "the voice of the cities", to complement the substantial amount of work that has already been undertaken for highways and vehicles. Starting with the user perspective on how cooperative systems can contribute to solving city challenges, CIMEC aimed to address the goals and constraints of cities, balancing costs and benefits.

Dialogue with local authorities, agencies and stakeholders, and engagement with suppliers and other C-ITS stakeholders have been key activities throughout the CIMEC project. City needs and requirements have been captured and discussed through a series of surveys and workshops, while providers of C-ITS solutions have been consulted for information about product development and commercial projections. This approach enabled the development of a credible, practical Roadmap for the deployment of C-ITS in the urban environments. Further review by a broad range of city authorities validated the Roadmap, which is the main output of the CIMEC project.

During the project, the construction of a viable business case for cities to implement C-ITS has become increasingly important, in a context of core transport policies and strategies, legacy systems and limited budgets. One of the main recommendations from the CIMEC project for future actions, therefore, is to provide and make accessible a resource base of collated results and findings from projects and pilots, providing cities with as much robust evidence as possible of the real benefits from C-ITS in the urban environment. This will be invaluable to help cities justify their investments.

CIMEC was the first project of its kind in Europe to take the city perspective on C-ITS as a starting point. The outputs of the CIMEC project, including the insight and understanding of city views and requirements on C-ITS, the supplier market readiness for urban C-ITS, the status and recommendations regarding C-ITS standardisation, as well as the Roadmap itself, will be taken forward by the project partners – through their respective city networks and through participation in various European, national- and local-level working groups, forums and projects. The CIMEC consortium hope that the CIMEC legacy will be carried on through a range of future projects which will, in time, help to bridge the (still quite large) gap between C-ITS systems and their deployment in cities.

## 1.1. Why CIMEC?

While many of the larger European cities are able to develop/procure and implement C-ITS solutions on their own and according to their own requirements, that is rarely the case for the medium-size and smaller cities. With respect to accelerated take-up of C-ITS-solutions, these cities represent – to a large degree – an untapped potential, as there is a large number of European cities within this size-range.

### DEPLOYMENT BARRIERS ARE NOT TECHNICAL

City deployment of C-ITS has lagged a long way behind technological development, indicating that deployment is being restrained primarily by non-technical factors. Cities in particular are wary about the costs and benefits. Part of the role of CIMEC has been to facilitate the take-up of C-ITS by increasing the alignment of technological solutions with user needs.

### DEPLOYMENT IN CITIES IS NOT KEEPING PACE WITH THE HIGHWAYS

European highways authorities are relatively well educated, prepared and supported regarding C-ITS, including through a series of European and national funded R&D projects. However, significant benefits are expected through the more complex and fragmented city context, which up to now have been much less understood. CIMEC has focused specifically on this urban C-ITS context.

### DEPLOYMENT SHOULD HAPPEN IN AN OPEN MARKET PLACE

The larger traffic system suppliers are geared up for their own vision of C-ITS; the same cannot be said for the small and medium-sized suppliers. CIMEC has reached out to a wide range of suppliers, in many parts of the supply chain – especially those supplying the four partner cities – in order to help build a rich and open market place for C-ITS.

### DEPLOYMENT SHOULD BE SIMPLE AND INTEGRATION AUTOMATIC

In future there will be many suppliers providing cities with systems, and many different suppliers providing vehicle-mounted equipment. The only way to guarantee that these can become an effective cooperative ITS is to drive the development and adoption of effective technical, operational and potentially even commercial standards. CIMEC has explored where the current standards are incomplete or underused, and how these standards gaps can be filled.

## 1.2. Objectives

The overall aim of CIMEC has been to support the efforts by the European Commission in accelerating the take-up of cooperative systems and associated legal, organisational, technical and standardisation

issues by enabling "the voice of the cities". Within this, the specific objectives of the project have been to:

- Gain better understanding of the challenges, enablers and barriers, and strategies for use of C-ITS solutions in European cities
- Bridge the gap between C-ITS development and deployment through city-focused discussion on most relevant applications of C-ITS technology
- Identify future city specific processes and interfaces
- Identify how emerging standards for C-ITS will affect, and should respond to, the systems and processes in the urban environment
- Show possible system architecture and workflow of C-ITS support systems
- Raise awareness and campaigning for C-ITS by promoting multi-sector stakeholder dialogue, engagement and collaboration
- Provide a Roadmap for Deployment with Europe-wide applicability

## 1.3. Project structure

The CIMEC activities have been organised according to the following structure:

- WP1 concentrated on the cities' situation
- WP2 explored C-ITS solutions
- WP3 drew up a roadmap to implementation for relevant C-ITS solutions in the cities.
- WP4 coordinated dissemination of project result, including through a pool of follower cities, CIMEC City pool, which also provided
  - input to WP1 and WP2
  - review forum for WP3 roadmaps
- WP5 undertook project management activities

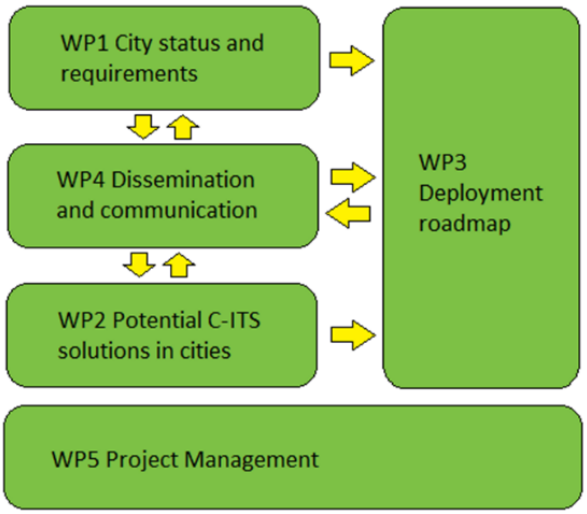


**Figure 1: CIMEC project structure**

# 2. Main scientific and technical results

## 2.1. Overview of outreach activities

CIMEC is a Coordination and Support Action (CSA), and consequently, outreach activities have been a prominent part of the activities throughout the project. The aim of these activities has been to provide the respective stakeholders with the appropriate information to further their own commitment to deploying C-ITS through:

- raising city awareness on the opportunities which C-ITS solutions might represent in solving their particular transport challenges, and
- raising awareness among ITS suppliers on city needs and requests regarding the development of C-ITS solutions.

The project has engaged with local city authorities and stakeholders as well as suppliers through a series of workshops and online surveys at different stages in the project.

### 2.1.1. City stakeholder engagement

The four CIMEC partner cities Bilbao, Kassel, Reading and Trondheim have hosted *three workshops each*, engaging a total of 158 external participants;

- two workshops early 2016, one local and one regional, as part of WP1 (City status and requirements), focussing on cities' challenges, needs, requirements and barriers regarding C-ITS deployment.
- one regional workshop early 2017, as part of WP3 (Deployment Roadmap), discussing and validating the draft Roadmap for C-ITS deployment in cities.

The two WP1 workshops were combined with two *online surveys* targeting city stakeholders. The surveys engaged a total of 17 local partner city stakeholders (Survey B) and 58 regional city stakeholders (Survey A), and provided results which were used as a starting point for the respective workshops.

Three *Europe-wide City Pool workshops* have been held during the lifetime of the project, engaging a total of 38 distinct local authorities (excluding partners) from 14 different countries. The workshops were part of the WP4 (Dissemination and communication) activities, focussing on topics reflecting the ongoing activities in the project at the time of the workshop;

- March 2016, joint with the H2020 CODECS project: on cities' challenges and requirements
- November 2016, joint with the H2020 CODECS project: on cities' needs and the role the industry
- May 2017: on the Roadmap for deployment

### 2.1.2. Supplier engagement

The CIMEC project has engaged with the industry through an online survey, workshops and discussions at relevant events such as congresses and conferences. The project has approached suppliers of each of the four CIMEC partner cities, existing contacts of CIMEC partners, as well as suppliers identified through other H2020 projects.

- Supplier online survey and interviews; 39 participants
- Supplier workshop; 3 external participants
- Standardisation workshop; 5 external participants

Suppliers have also been represented in the City Pool workshops with presentations.

## 2.2. WP1: City Status and requirements

### 2.2.1. Objectives

The objective of this work package has been to identify the cities' main transport challenges and associated strategies, and to identify barriers towards take-up of C-ITS solutions. The work package provides insight into internal and external conditions which guide the choices and priorities of cities in employing C-ITS solutions for solving transport challenges. WP1 was led by SINTEF.

### 2.2.2. Work undertaken

The main activities of this work package has been *planning*, *conducting* and *reporting* individual workshops with the cities and the accompanying online surveys. The purpose of these activities has been for cities to present their transport challenges, their strategies for dealing with these challenges and the prevalence of ITS/C-ITS solutions in both strategy and practice. The workshops were used for exploring the cities' barriers and enablers regarding greater use of C-ITS solutions, as well as to identify potential C-ITS use cases which are relevant for the cities. This work package provided input and information to WP3, and represents part of the basis upon which Roadmaps for facilitating the deployment of C-ITS have been drawn.

#### WORKSHOPS AND SURVEYS

Each of the CIMEC partner cities hosted two workshops (one Local and one Regional) during the first three months of 2016. The workshops were mainly held in the local language. The duration of each of the workshops was ½ -1 day.

- The local city workshops were aimed at a broad cross section of stakeholders either having an interest in traffic management and use of ITS/C-ITS, or being affected by any (lack of) implementation and deployment of new technology in the city roads.

- The regional workshops were held with stakeholders from cities in the regions of the four cities, focusing on the deployment of ITS/C-ITS in cities, challenges, requirements and barriers related to this.

Details on participation in each of the workshops and surveys is included in the table below.

Table 1: CIMEC WP1 workshops and surveys participation

| | Reading / UK cities | Kassel / German speaking cities | Trondheim / Nordic cities | Bilbao / Spanish & French + Other cities | SUM |
|---|---|---|---|---|---|
| **Local stakeholders** | | | | | |
| Workshop: | | | | | |
| Stakeholders | 12 | 21 | 10 | 16 | 59 |
| *Additional partners* | *6* | *8* | *3* | *5* | *22* |
| Survey B: | 2 | 6 | 4 | 5 | 17 |
| **Regional stakeholders** | | | | | |
| Workshop: | | | | | |
| Stakeholders/city representatives | 12 | 28 | 5 | 4 | 49 |
| *Additional partners* | *6* | *8* | *3* | *5* | *22* |
| Survey A: | 10 | 26 | 9 | 13 | 58 |

- The workshop participants provided valuable input to the CIMEC work, and also expressed interest in being involved in the CIMEC WP3 Roadmap process following the WP1 workshops.
- Some of the workshop participants representing larger than small/medium sized cities, also expressed the need for a "CIMEC for larger European Cities".
- Issues related to automated driving were touched upon in the workshop discussions.
- A wide range of city-relevant Use Cases for C-ITS were identified through the CIMEC WP1 surveys and workshops. These activities also provided information about the cities' transport related challenges and strategies, prevalence of ITS applications, plans, requirements and barriers for further deployment of C-ITS.

Findings from the WP1 workshops and surveys have been synthesised and documented in CIMEC deliverable D1.1 'City status and requirements for C-ITS deployment'. This deliverable is based on the workshop reports provided by the respective CIMEC city partners, and findings from the WP1 surveys.

## 2.2.3. Scientific and technical results

The CIMEC report (D1.1) 'City status and requirements for C-ITS deployment' brings together the main conclusions from the local and regional workshops and the survey findings, including a list of use cases of potential interest for cities.

Findings from the surveys include:

**What cities want:**

- To reduce congestion
- To improve the environment – specifically regarding air pollution
- To maintain safety on the network
- To improve accessibility by promoting excellent public transport (partly to support the above goals)

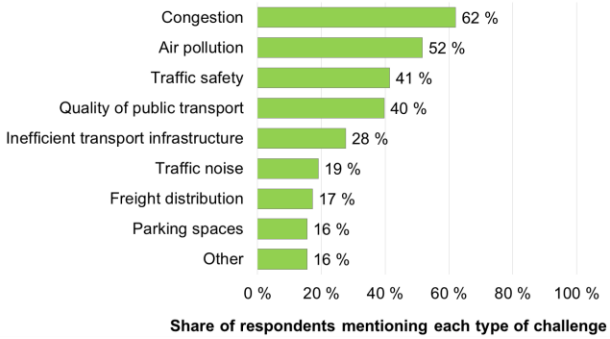


**Figure 2: Three most prominent mobility/transport challenges in the cities (N=58)**

**Cities' policies to solve the challenges:**

- The policies reflect the challenges
- The use of "Pull" measures (promotion and awareness raising) to enhance modal shift is a predominant strategy for most cities

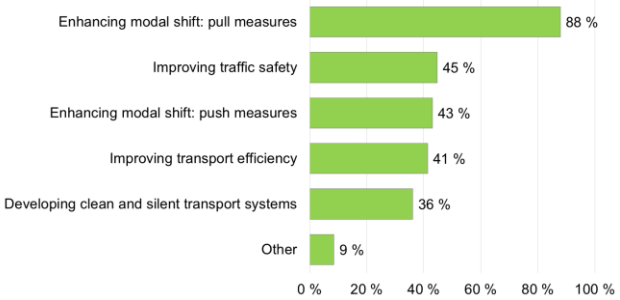


**Figure 3: Three most prominent policies to meet transport related challenges in the cities (N=58)**

**Cities strategies for (greater) use of ITS/C-ITS:**

- One out of four cities already have a strategy for the use of ITS/C-ITS
- The smaller the city, the more likely that it does not have or work with a strategy

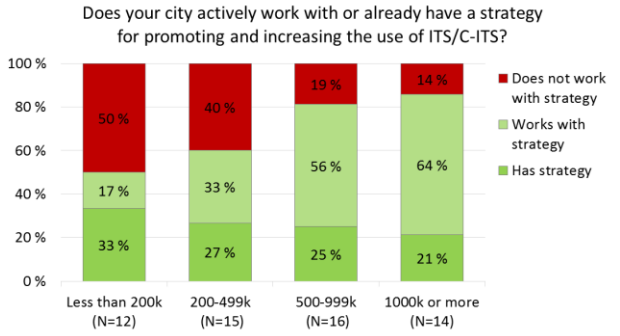


**Figure 4: Prevalence of strategy for use of ITS/C-ITS – by city size**

**Why no strategy related to use of ITS/C-ITS?**

- Lack of personnel with relevant competence
- Lack of financial resources
- Lack of confidence that technology will help deliver policies

City consultations in workshops have identified that:

**Cities lack knowledge about:**

- what products are available
- which products will work with each other, or with the systems that will be acquired by road users
- the cost of acquiring or operating products

**Cities need to be convinced that the technology:**

- is available and meets the specification
- will do the job better than another (cheaper) solution
- is well tested to achieve the outcome desired
- is well tested to be safe in the context applied
- is a price which is manageable within the budget
- will integrate with the city's own legacy systems
- is future-proofed against obsolescence

Through the workshop discussions, a set of C-ITS use cases with potential city interest/benefit was identified. The use cases represent a mix of general and more specific areas of application, with some overlap. The general areas include provision of information to road users, conducting access control and management of traffic lights and parking, while also addressing specific categories of road users such as freight vehicles, emergency vehicles of vulnerable road users (VRUs). Some of these use cases were initially identified in the H2020 projects CODECS and VRUITS, but included in the CIMEC discussions. The use cases identified in WP1 were further developed during WP3.

### 2.2.4. Impact on other work packages

The results and finding from the WP1 city stakeholder surveys and consultations have provided input to WPs 2, 3 and 4:

Table 2: WP1 contributions to other WPs

| Topical Work packages | |
|---|---|
| **WP2 Potential C-ITS solutions and standardization for cities** | ▪ Contact info for CIMEC partner cities' ITS suppliers<br>▪ Contact info for ITS responsible in cities responding to WP1 survey<br>▪ Input for supplier discussions:<br>- Cities' take on and knowledge of C-ITS<br>- C-ITS use cases of potential interest for cities |
| **WP3 Roadmap for deployment** | ▪ Basis for Roadmap drawing:<br>- Cities' take on and knowledge of C-ITS<br>- C-ITS use cases of potential interest for cities<br>▪ Participants in WP3 workshops for discussing and validating the draft Roadmap |
| **WP4 Dissemination and communication** | ▪ Input for City Pool workshops:<br>- Cities' take on and knowledge of C-ITS<br>- C-ITS use cases of potential interest for cities<br>▪ Contact info for interested recipients of the CIMEC Newsletter |

## 2.3. WP2: Potential C-ITS solutions and standardisation for cities

### 2.3.1. Objectives

The objective of this work package has been to identify potential (current and future) markets for cooperative ITS solutions with specific benefit in the urban environment. Thus, the work package has approached suppliers of ITS/C-ITS infrastructure and services to discuss the product emergence and their commercial expectations. The activities have included joint discussions with industry and city representatives to identify standards which need to be influenced and potential new standards required to consider e.g. urban configuration processes for C-ITS infrastructure. WP1 was led by AlbrectConsult.

### 2.3.2. Work undertaken

Liaising with suppliers has been an important and challenging part of the activities in this work package. An online survey was distributed to the suppliers identified by the CIMEC project partners and by cities participating in the WP1 surveys and workshops. The purpose of this survey was to get insight into the supplier's type of and level of activity and ambitions regarding C-ITS in general, and for the urban context. Ambitions to arrange a series of supplier workshops proved hard to complete, and led to a change of strategy into attending events where suppliers could be met with and interviewed.

#### SUPPLIER DATABASE

In order to engage a wide range of suppliers and to extend the number of small and medium sized suppliers involved, core and follower cities were asked to provide information about their ITS suppliers. Information about these suppliers has been entered into a supplier database, along with information about large suppliers already identified through the consortium's existing networks. A total of 113 suppliers of ITS/C-ITS are represented in this supplier database. The initial version of the supplier database has been documented in CIMEC deliverable D2.1 'Contact database on cities' ITS suppliers', and the extended version of the data base, in D2.2 'Suppliers ambitions and expectations'.

#### SURVEY ON SUPPLIER'S AMBITIONS AND EXPECTATIONS

An online survey was distributed to the suppliers to identify their initiatives and ambitions for C-ITS solutions in urban areas. The survey was designed to provide insight into the industry view on emerging C-ITS products, potential benefits for cities, commercial expectations and barriers towards urban C-ITS deployment.


Figure 5: Supplier survey participation

One third of the suppliers in the data-base responded to the survey. The responding suppliers represented industry across some 10 European countries, from a variety of sectors within the ITS area, and of different company sizes.

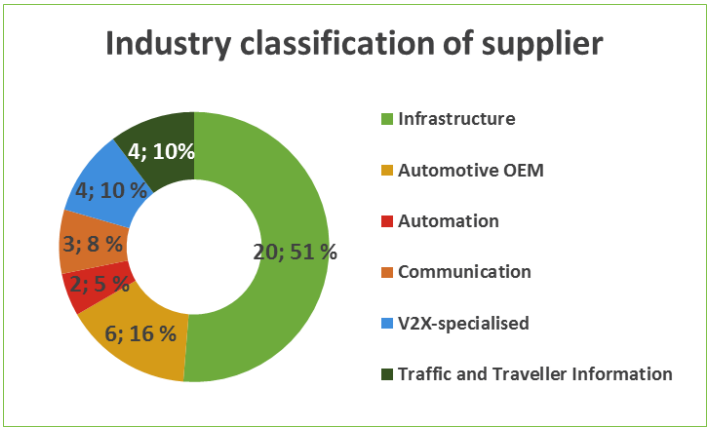


Figure 6: Industry classification of suppliers (N=39)

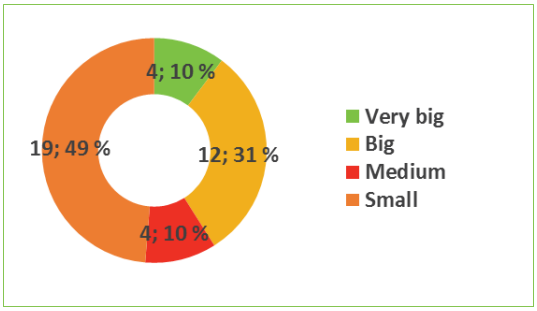


Figure 7: Supplier size (N=39)

The initial responses and findings from supplier online survey has been documented in CIMEC deliverable D2.2 'Suppliers ambitions and expectations'. Due to the required changes in strategy regarding further discussions with the industry, deliverable D2.3 'Supplier workshops' also includes findings from a prolonged online survey, and can thus be considered an extension of the D2.2.

## SUPPLIER WORKSHOPS CONVERTED INTO INTERVIEWS

The initial plans for this work package included a one-day supplier workshop in each of the respective regions for the four CIMEC cities (Germany for German speaking countries, Norway for Scandinavia, UK for UK-Suppliers, Spain for southern Europe). Due to low interest from the industry, the workshop plans had to be changed. Instead of inviting suppliers to workshops, CIMEC partners attended events where the supplier industry would be represented, and conducted discussions and face-to-face interviews there. Interviews were conducted at the following events:

- Intertraffic - 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)

The responses and findings from supplier interviews are documented in CIMEC deliverable D2.3 'Suppliers workshops'.

Standards, or lack thereof, play an important role in the deployment of C-ITS in the urban environment. Assessment of ITS/C-ITS standards has been included in the work package activities. This assessment was conducted in a three-step process:

- compiling a list of existing standards; 148 standards were identified
- CIMEC-internal assessment of relevance of the identified standards, based on criteria important for urban authorities, resulting in a short-list of 40 standards
- standardisation workshop in Brussels, discussing the short-list of standards, and identifying further needs for standards for the urban environment

The activities on standardisation are documented in the CIMEC deliverable D2.4 'C-ITS standardization requirements for the urban environment', and in D2.5 'C-ITS standardization requirements for the urban environment', which is an extension of the D2.4, including recommendations on further standardisation

### 2.3.3. Scientific and technical results

The CIMEC report (D2.3) 'Supplier workshops' brings together the main findings and conclusions from the activities on supplier's views and ambitions regarding C-ITS in the urban context.

**Supplier's responses confirm that:**

- the development of C-ITS within the industry is still at an early stage
- mature and effective solutions / products / components for the urban environment are likely to take some time to emerge
- a small number of large (key) suppliers are the main "engine" in C-ITS development and deployment

The main findings and conclusions from the activities on standardisation requirements for deployment of C-ITS in the urban context are summarised in the CIMEC report (D2.5) 'C-ITS standardization requirements for the urban environment'. The recommendations cover the need to identify and address:

- standards already in use in urban ITS that need to be adapted for C-ITS use
- C-ITS standards that might limit the functionality in urban use cases
- standards that have an impact on urban operator's business processes
- standards supporting procurement
- new standards requirements specifically focussed on the urban C-ITS context; in particular, a control interface standard to link roadside devices (such as signal controllers) to in-station systems
- mechanisms for certification of product compliance
- a common security mechanism (including a trust authority)

### 2.3.4. Impact on other work packages

The results and finding from the WP2 activities have provided input to WPs 3 and 4:

Table 3: WP2 contributions to other WPs

| Topical Work packages | |
|---|---|
| **WP3 Roadmap for deployment** | ▪ Basis for Roadmap drawing:<br>- Supplier's take on and ambitions for urban C-ITS<br>- C-ITS products of potential interest for cities<br>- Assessment of standardisation requirements for urban C-ITS |
| **WP4 Dissemination and communication** | ▪ Input for City Pool workshops:<br>- Supplier's take on and ambitions for C-ITS<br>- C-ITS products of potential interest for cities<br>▪ Contact info for interested recipients of the CIMEC Newsletter |

## 2.4. WP3: Deployment Roadmap

### 2.4.1. Objectives

The objective of this work package has been to develop a realistic Roadmap for the deployment of C-ITS in the city environment, taking into account the goals and constraints of cities (identified in WP1) and the product emergence and commercial expectations of suppliers (identified in WP2). The aim has been to document a comprehensive characterisation of the issues that are likely to affect the urban deployment of C-ITS over the foreseeable future The realism of this Roadmap has been tested through detailed review with the partner cities and in regional city workshops. WP3 was led by Centaur Consulting.

### 2.4.2. Work undertaken

The CIMEC Roadmap for deployment of C-ITS in European cities is the result of a three-step process:

- establish a Roadmap framework
- prepare a draft Roadmap for internal and external validation
- prepare the final Roadmap document

#### ROADMAP FRAMEWORK

The initial Roadmap framework (deliverable D3.1 'Roadmap Framework') was developed based on a review of the factors involved in the implementation of C-ITS which arose during the stakeholder programmes of WP1 (for cities) and WP2 (for suppliers), and agreed with the project partners. Factors covered within the framework included a consideration of city policy *vs* C-ITS functionality; quantifiable

benefit *vs* anticipated cost of acquisition/operation; city scale factors (population, density, economics etc.); longevity, maturity and feasibility of products/services; social acceptability (e.g. for privacy); and marketplace coherence.

The structure identified in the Framework developed the following structure for the Roadmap:

- The opening chapters provide background on the context and current state of the art:
  - how complex the operation of a city is, and the practical conditions in which it operates
  - what C-ITS is, from the perspective of a potential city user (and not deeply technical)
  - the current state of the supplier market, specifically focussed on city C-ITS suppliers
- The middle section presents and analyses specific functionality from the perspective of what provides tangible benefit to a city:
  - a review of the ways in which C-ITS could, potentially, be useful to cities, based on research conducted directly with cities and others during CIMEC and in related projects.
  - which key factors that might go into evaluating a potential city C-ITS project
  - specific functions that are likely to form part of a city programme – subject to local relevance, budget availability, etc.
  - some key lessons for how a city's selected "shortlist" of C-ITS services could be put together in a robust and practical programme
- The final section steps back to explore some additional key factors:
  - how city C-ITS deployment will be affected by developments outside the control of cities and their supply chains, and implicitly sets a challenge to the wider set of stakeholder
  - a brief summary of the Roadmap's key conclusions.

## DRAFT ROADMAP

The D3.2 'Draft Roadmap' was structured according to the D3.1 'Roadmap framework'. It is the result of a detailed analysis of the city perspectives derived from the WP1 activities, and of the supplier perspectives and standardisation issues as identified in WP2. The Draft Roadmap formed the basis for an extensive review and validation process:

- internal review, most prominently by the four CIMEC city partners
- external validation in four regional workshops involving a larger number of cities

As well as drawing on WP1 and WP2, the Roadmap drew on a range of other projects and initiatives input on city C-ITS. Resources consulted during the preparation of the Roadmap include:

- the C-ITS Platform, specifically the Phase 1 final report and discussions within the new Urban WG
- the Car2Car Consortium and the Amsterdam Group, through a variety of conferences, presentations and documents
- the main European Connected Corridors projects

- European R&D projects, especially CODECS but also Compass4D, CONVERGE, DriveC2X, TEAM and VRUITS
- public documentation on the EC's planned research (especially H2020 calls) where the results may provide evidence in the near future
- Ertico reviews and activities, including the TM2.0 platform
- where available, summaries of national C-ITS research (focusing on project partners' Member States)

## FINAL ROADMAP

The D3.3 'Final Roadmap' was based on the 'Draft Roadmap' (deliverable D3.2). As well as a small amount of revision, extension and clarification arising from public feedback, the Final Roadmap also includes an annex with a set of outline strategies for C-ITS by each of the four CIMEC partner cities, based on their understanding of the Roadmap and making specific links to the local relevance and practicality of the CIMEC use cases.

As part of the outreach, dissemination and validation process, each of the CIMEC partner cities hosted a regional workshop during the first months of 2017. These workshops were part of the validation process for the Roadmap. The workshops were mainly held in the local language. The duration of each of the workshops was ½ -1 day.

Table 4: CIMEC WP3 workshops participation

| | Reading / UK cities | Kassel / German speaking cities | Trondheim / Nordic cities | Bilbao / Spanish & French + Other cities | SUM |
|---|---|---|---|---|---|
| **Regional stakeholders** | | | | | |
| Workshop: | | | | | |
| Stakeholders/city representatives | 15 | 10 | 5 | 26 | 56 |
| *Additional partners* | *8* | *4* | *5* | *4* | *21* |

## ENSURING EUROPE-WIDE APPLICABILITY

For practical reasons, the project has only been able to sustain detailed discussions with a limited number of cities, and we have engaged some of those that are most able to understand and comment on the C-ITS agenda. However, it is important to ensure that the WP outputs are not excessively swayed by the specific contexts in these cities.

Throughout the WP, therefore, Polis has been involved to ensure that (a) it has a good perspective on the progress of the WP, with a view to ensuring adequate levels of external communication; (b) advising on where other city perspectives might be relevant, through its membership; and (c) advising on the readability, coherence and clarity of the WP reports. This has been conducted in three ways: by using its

own wide spectrum of experience as a European city network; by ensuring that WP4 allows communication on the right topics, with as broad a reflection community as possibly; and by ensuring that the WP engages with the CIMEC City Pool, in order to address specific issues more effectively. The Final Roadmap was the main topic of the third and final CIMEC City Pool workshop in May 2017.

### 2.4.3. Scientific and technical results

The CIMEC deliverable D 3.3 Final Roadmap is the main output of CIMEC: 'A Roadmap for European cities'.

The primary audience for the Roadmap is "cities" (in the broad sense, including e.g. regional local road authorities), for whom the document is intended to be an educational guide on how, why and when to approach the issue of C-ITS.

The secondary audience is stakeholders whose actions provide important externalities for cities: national policymakers, funding authorities, the vehicle industry, the ICT industry, etc. For this audience, the Roadmap is intended to be an indication of where and how to focus:

- regulatory development
- funding interventions
- support services
- product development
- marketing

While the CIMEC project is nominally focussed on "medium European cities", much of the Roadmap is expected to be equally relevant to cities which are (a) larger or smaller, or (b) outside Europe.

This Roadmap is intended, above all, to be an overview perspective on how the city C-ITS market is expected to develop in Europe: to provide a vision that European cities can collectively recognise and support, and that other stakeholder can benefit from in their political or commercial planning.

A core part of D3.2 was the refinement of an extended set of use cases (see Table 5 and Table 6 below), based on those that emerged during WP1 and enhanced with input from a range of other projects and initiatives – notably, from the emerging work of the newly-formed Urban Working Group of the EC's C-ITS Platform (whose first meeting was September2016).

The resulting use cases do not represent a catalogue of what cities want - just of things that they are "willing to listen about", because they represent activities which align with their policy rather than simply being technology-led.

Table 5: C-ITS use cases with potential city interest - general areas of application

| General areas of application | |
|---|---|
| **Information to road users**  | UC1: Individual routing of vehicles<br>UC2: In-vehicle signs<br>UC3: In-vehicle signal information<br>UC12: Inform about incidents in the road network and access control to these areas<br>UC13: Inform about emergencies in the road network and access control to these areas |
| **Traffic light management**  | UC8: Traffic light management<br>UC7: Green lights for police and emergency vehicles<br>UC9: Green lights for public transport vehicles<br>UC10: Green lights for cyclists |
| **Access control**  | UC5: Access control for heavy goods vehicles with dangerous goods<br>UC6: Regulation of access to free lanes for electrical vehicles<br>UC14: Dynamic access control for air quality management |
| **Parking management**  | UC11: Parking management |

Table 6: C-ITS use cases with potential city interest – for specific road user categories

| Specific areas of application | |
|---|---|
| **Vulnerable road users (VRUs)**  | UC10: Green lights for cyclists<br>UC15: Speed enforcement around schools<br>UC16: C-ITS services for vulnerable road users<br>UC17: Pedestrians crossing in front of bus/tram<br>UC18: Bike lane change and unusual crossing |
| **Emergency vehicles**  | UC7: Green lights for police and emergency vehicles |
| **Freight vehicles**  | UC4: Management of loading and unloading areas for freight vehicles<br>UC5: Access control for heavy goods vehicles with dangerous goods |

It became clear very quickly that cities will implement C-ITS only where they see a reasonable case for benefit to local transport, in the context of established policy and limited budgets. This is challenging as many urban C-ITS services are still in their infancy, and robust long term evidence is not yet available.

Chapter 7 of the Roadmap, therefore, looks at how a city might create a realistic strategy for rolling out C-ITS within its own systems. This includes a consideration of which services are likely to be most

relevant, how they can be packaged together, how to engage with others, and what will trigger a decision to procure (if and when the time comes).

For each of the 18 CIMEC use cases, an outline quantitative assessment was provided on:

- the extent and robustness of available evidence
- political feasibility
- technical feasibility – including interoperability and links with legacy systems, and identifying the suitability of different communications options
- commercial feasibility – likely costs, support for phased implementation, cost risks etc.
- utility to road users
- utility to city managers
- social and legal issues, especially regarding the key issue of privacy protection

Finally, the results of CIMEC point to two broader conclusions for the EC and Member States:

- One of the major barriers to city C-ITS is the lack of robust evidence that there is a tangible benefit for them. There is therefore a need for an evidence base to be collated, including from the range of projects – historical, current and upcoming – that Europe already has.
- The city C-ITS market is still in its early stages, and a continued dialogue among stakeholders would be beneficial: bodies such as the C-ITS Platform at European level, and connected activities at national/regional levels, should be sustained and strengthened, with a continued focus on cities.

### 2.4.4. Impact on other work packages

The results and finding from the WP3 activities has provided input and topics for the WP4 City Pool workshops.

# 3. Potential impact

The CIMEC outcome and more specifically the Roadmap, will potentially influence different sets of stakeholders as indicated below.

## LOCAL CITY AUTHORITIES

(transport teams, procurement officers, legal staff, senior decision makers)

- Increased understanding of the ways in which C-ITS could, potentially, be useful to cities as tool to support key city policy goals, e.g. to improve:
  - traffic efficiency
  - traffic safety
  - the environment
  - accessibility
- Increased insight in the supplier market, specifically:
  - city C-ITS suppliers
  - products on offer/under development
- Overview of key factors that might go into evaluating and assessing a potential city C-ITS project, such as:
  - size, nature and beneficiary of benefit
  - cost of implementation/operation
  - market maturity and future-proofness
  - dependencies on third parties
  - liability exposure and risk
  - use of personal data
- How to develop and assess specific functions that can be part of a city C-ITS programme:
  - political, technical and commercial feasibility
  - utility to road users and to city managers
  - social/legal issues
- Understanding of how to go about deployment of C-ITS, including:
  - how to set a strategy
  - how to establish project ownership
  - skills required
  - requirements for a communication architecture
  - how to plan a programme for C-ITS infrastructure
  - stakeholder involvement and coordination
- Understanding of issues to consider for procurement and implementation, including:
  - commercial model
  - specification requirements and evaluation criteria

## LOCAL CITY STAKEHOLDERS AND ROAD USERS (LONGER TERM EFFECTS):

- saving travel time
- saving fuel
- reducing the risk for accidents
- improving the comfort of travelling through better information

## SUPPLIERS OF C-ITS:

Increased understanding of:

- how complex the operation of a city is, and the practical conditions in which it operates
- how "the city" thinks about and understands C-ITS
- use cases and areas of application of C-ITS which cities may be interested in

## NATIONAL AND INTERNATIONAL AUTHORITIES:

An indication of where and how to focus:

- legal developments
- private sector developments
- evidence base
- funding support
- implementation support

## STANDARDISATION BODIES:

Standardisation requirements for urban C-ITS deployment:

- standards already in use in urban ITS that need to be adapted for C-ITS use
- C-ITS standards that might limit the functionality in urban use cases
- standards that have an impact on urban operator’s business processes
- standards supporting procurement
- new standards requirements specifically focussed on the urban C-ITS context; in particular, a control interface standard to link roadside devices (such as signal controllers) to in-station systems
- mechanisms for certification of product compliance
- a common security mechanism (including a trust authority)

**RESEARCHERS:**

Build on and include in future research activities acquired new knowledge of:

- how "the city" thinks about and understands C-ITS
- the gap between cities' understanding of the possibilities and limitations in C-ITS technology and the technology suppliers' understanding of the cities' needs
- cities' requirements
- use cases and areas of application of C-ITS which cities may be interested in

Survey methodology and outcome:

- questionnaires developed
- survey responses for further studies

## 3.1. Impact by topical WP

### 3.1.1. WP1 City status and requirements

The main exploitable results from WP1 are:

- CIMEC report (D1.1) 'City status and requirements for C-ITS deployment'
- results of the Europe-wide city survey (Survey A)

The report provides insight into the experiences, reflections and ideas of many European cities, collected through means of local and regional city stakeholder workshops, and a pan-European city survey which secured more than 50 responses from city authorities. The survey results can be used independently of the report D1.1.

### 3.1.2. WP2 Potential C-ITS solutions and standardizations for cities

The main exploitable results from WP2 are:

- CIMEC report (D2.3) 'Supplier workshops'
- CIMEC report (D2.5) 'C-ITS standardization requirements for the urban environment'
- supplier database

The report 'Supplier Workshops' provides insight into the supplier market readiness for C-ITS, based on supplier survey and extensive outreach activities. The report 'C-ITS standardization requirements for the urban environment' presents two key results: the first is the identification of key, relevant ITS/C-ITS standards that cities need to be aware of when procuring and deploying C-ITS. The second is a set of standardisation recommendations for the target audience (urban road operators and the European Commission, among others).

### 3.1.3. WP3 Deployment Roadmap

The main exploitable result from WP3 is:

- CIMEC report (D3.3) 'C-ITS Roadmap for European cities'

The roadmap is the main output of the CIMEC project in that it is based on the main findings of all preceding project activities. It draws on an extensive consultation process with both city stakeholders and the ITS industry, and presents a practical and realistic view of how the urban C-ITS environment is likely to develop over the next 5-10 years. The roadmap is available in a short, medium and full-length version: the one pager in English, Spanish and German is targeted at politicians; the roadmap summary (approx. 15 pages) is intended for the decision marker; whereas the full-length version is intended for operational staff.

# 4. Dissemination activities and tools

The CIMEC dissemination activities have been coordinated in work package 4, led by POLIS. CIMEC deliverable D4.1 'Dissemination strategy' was prepared during the first months of the project, and has been the basis for the dissemination activities carried out through the project. This document included identification of relevant target groups and how to engage with/inform them, as well as plans for developing and use of promotional tools, online media and networking.

Target group for dissemination include:

- sub-national authorities (mainly cities)
- sectorial transport groups (mainly public transport and freight stakeholders)
- system suppliers, service providers and vehicle manufacturers
- academia
- transport authorities and ITS associations (national and European level)
- policy makers (national and European level)

## 4.1. Promotional tools

Communications in electronic and printed form has been an essential mechanism for the dissemination of the project activities, objectives and outputs to various target audiences. To support this, the following tools, publications and other materials has been developed.

### 4.1.1. Project identity and templates

A project logo, branding guidance, and a set of templates (Word, PowerPoint, reports, etc.) have been developed by a professional communications agency to give the project a common and recognisable identity. This identity has been used on all project and local dissemination materials.

Figure 8: CIMEC logo

### 4.1.2. Project web site

The website is the most important source of information on activities within the project. It provides a description of the project objectives and priorities, main areas of activity, profiles of consortium partners with links to partner's websites, news and events, project results, link to current and past projects and other relevant websites. The CIMEC website domain name is: www.cimec-project.eu.

The CIMEC website was launched on December 1, 2015. Main statistics on the website visits are presented in Figure 9. The statistics include information on:

- SESSIONS: A session is the period time a user is actively engaged with your website, app, etc. All usage data (Screen Views, Events, Ecommerce, etc.) is associated with a session.
- USERS: Users that have had at least one session. Includes both new (1581) and returning users.


**Figure 9: CIMEC website; visitor statistics**

It is particularly interesting to notice that, from January 2017 on, the visits have significantly increased, probably because of the publication of the main findings of the project in regional workshops and the promotion of the final conference.

CIMEC project partners have created CIMEC web pages on their own websites[1, 2].

[1] http://www.sintef.no/cimec_en; http://www.sintef.no/cimec_no

[2] http://www.albrechtconsult.com/index.php?id=19&L=0&tx_ttnews[backPid]=3&tx_ttnews[tt_news]=185&tx_ttnews[pointer]=1&cHash=b621c57cb6

## 4.1.3. Project leaflet

A project leaflet (Figure 10) was produced at the beginning of the project, with a print-run of 1000 copies. The leaflet describing the scope, objectives, and activities, expected outputs and partners. The leaflet has been distributed at local, regional and European level by all project partners.


**Figure 10: CIMEC leaflet (2015)**

## 4.1.4. Roll-up banner

A roll-up poster has been produced for promoting the project at relevant events around Europe. The roll-up advertises CIMEC's key messages, referring those interested to the website for more information.

### 4.1.5. Electronic newsletters

Electronic newsletters informing the identified target groups and other potentially interested stakeholders about the progress of the project has been distributed approximately every six months, depending on project results. The newsletter has been available from the project website, and circulated electronically to the CIMEC contact database (section 4.3.1).

A total of seven CIMEC newsletters have been published:

- #1: March 2016
- #2: September 2016
- #3: December 2016
- #4: February 2017
- #5: February 2017
- #6: March 2017
- #7: April 2017


CIMEC 1st Newsletter

March 2016

Dear reader,

Welcome to the first issue of the CIMEC newsletter!
CIMEC, a two-year European project focusing on C-ITS and cities, is now well into its first year and has already made significant progress in terms of reaching out to local authorities and understanding requirements for implementing (C-)ITS.
You will read about the various local, national and European workshops that have taken place in this newsletter, as well as ongoing work in building a picture of the suppliers perspective on C-ITS.
CIMEC is cooperating closely with sister project CODECS and welcomes linking up with other C-ITS projects addressing implementation in cities.
If you wish to be informed about future CIMEC developments, please **subscribe to the newsletter** via the CIMEC website HERE.

We wish you a pleasant read!

Engaging with cities on C-ITS

CIMEC-CODECS C-ITS AND CITIES WORKSHOP - LONDON
The first meeting of the CIMEC-CODECS City Pool took place on 3 March 2016 in London. The main points of discussion were city requirements for C-ITS as well as supplier and vehicle manufacturer expectations. The attendance was high: 55 delegates coming from all Europe attended the event. Read more

1ST CIMEC REGIONAL WORKSHOP - READING
As part of its work to understand the requirements and perspectives of cities, CIMEC is holding a short series of workshops around Europe, hosted by partner cities. The 1st CIMEC city workshop took place in Reading, UK on 13 January. Read more

**Figure 11: CIMEC Newsletter (#1, March 2016)**

## 4.2. Publications

### 4.2.1. CIMEC deliverables

All public CIMEC deliverables have been made available on the CIMEC web site. An overview of the deliverables is given in the References section.

### 4.2.2. The Roadmap

The C-ITS Roadmap is the principal outcome of the CIMEC project. To enhance the accessibility of the roadmap for the greater European audience, the full version of the 'Final Roadmap' (Deliverable D3.3) has been translated into German, and additional short versions and translations of these has been prepared to accommodate further dissemination of the main messages:

- one-page flyers in Spanish, German and English
- summary version in English

For the CIMEC final conference, a *booklet* (Figure 12) with a

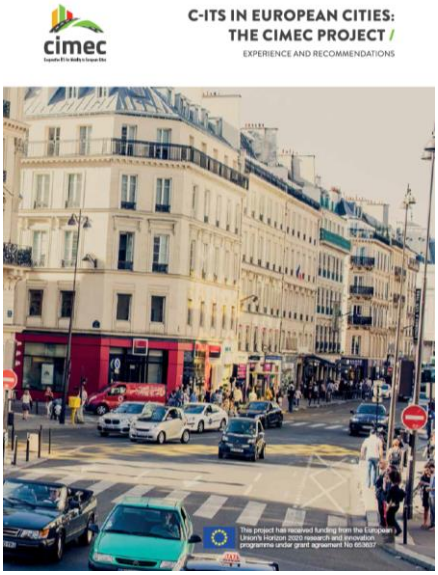


**Figure 12: CIMEC booklet (2017)**

print-run of 500 copies was prepared, conveying the main messages from the Roadmap. This booklet is also available from the project website. The booklet is currently under translation to Spanish and German, and it will be available in PDF format on the CIMEC website for download.

### 4.2.3. Articles for trade journals and popular press

Several articles have been prepared and presented in transport magazines and journals:

**Table 7: CIMEC articles for publication in trade journals and popular press**

| Journal | Title | Issue/Date | Author |
|---|---|---|---|
| Eurotransport | C-ITS – just a technology for cars? | Volume 15, issue 1, 2017 | Suzanne Hoadley, POLIS |
| Cities Today [3], online publication | How a European project is helping facilitate autonomous vehicles | February 26, 2017 | Hans Westerheim, SINTEF |
| Straßenverkehrstechnik (DE) | Integration von C-IVS in ein bestehendes städtisches IVS-Umfeld | June 16, 2017 | Osama Al Gazali, AlbrechtConsult |
| Intertraffic World | C-ITS standardisation needs in the urban context | October 2017 | Osama Al Gazali, AlbrechtConsult |
| Thinking Cities | Thank you for your cooperation: connected vehicles in urban areas | May issue 2017 | Mark Cartwright, Centaur Consulting |
| Samferdsel (NO) | Cities must pass many obstacles to use C-ITS (in Norwegian) | Probably June 2017 | Kristin Ystmark Bjerkan, Solveig Meland, Hans Westerheim, SINTEF |
| GEMINI (NO) | C-ITS for mobility in European Cities | Date T.B.D. | Kristin Ystmark Bjerkan, Solveig Meland, SINTEF |
| Transportation research C: Emerging technologies[4] | C-ITS in European cities (Scientific paper) | To be confirmed | Kristin Ystmark Bjerkan, Solveig Meland, SINTEF |

### 4.2.4. Presentations at external events

CIMEC activities and outcome has been presented at several external events and conferences. Main CIMEC activities at international conference are shown in Table 8. In addition, CIMEC partners have promoted the project, results and outcome by distributing leaflets and other dissemination material at regional, national and international events during the project lifetime.

[3] https://cities-today.com/

[4] https://www.journals.elsevier.com/transportation-research-part-c-emerging-technologies/

Table 8: CIMEC presentations at international events

| Conference/event | Title/Topic | Issue/Date | Partners |
|---|---|---|---|
| 22nd ITS World Congress, Towards Intelligent Mobility – Better Use of Space | CIMEC presentation | October 5, 2015 | POLIS |
| European Transport Conference 2016 Barcelona | Presentation: Supplier readiness for urban C-ITS | October 5, 2016 | AlbrechtConsult |
| Car2Car forum, Gaydon, UK | Presentation: Why do cities come second for C-ITS? | October 26, 2016 | Centaur Consulting |
| POLIS conference, Rotterdam (NL) | Presentation: From stand-alone ITS to connected ITS - What does it mean for cities and regions? | December 1-2, 2016 | Centaur Consulting |
| STTRIDE Stakeholder workshops, London (UK) | Stakeholders discussion - presenting results of CIMEC | May 15, 2017 | POLIS |
| C-ITS Deployment Day – UK, arranged by Department for Transport | Dedicated session on CIMEC /C-ITS Platform Urban C-ITS Working Group | May 24, 2017 | Centaur Consulting; POLIS; Reading Borough Council |
| ECOMM Confewrence, Maastricht (NL) | Stand | May 31, 2017 | POLIS |
| European Transport Conference 2017 Barcelona | Presentation: Roadmap for Cooperative ITS in European Cities | October 4, 2017 | Centaur Consulting |

## 4.3. CIMEC Networking and synergies

### 4.3.1. CIMEC City Pool

The CIMEC City Pool has been a forum to enable a wider gathering of input from cities on urban transport needs and requirements and opportunities for C-ITS deployment. Three City Pool workshops have been organised at relevant stages in the project. The two first workshops were joint event with the H2020 CODECS project. Invitations for cities to apply to join the CIMEC City Pool have been distributed by POLIS, and a budget was set aside to cover the travel expenses of up to 10 City Pool members. A wider group of cities were invited on an own-cost basis.

The CIMEC City Pool activities have engaged representatives of 38 distinct local authorities (excluding project partners) from 14 different countries. A comprehensive description of agenda, discussions and participant at each of the three workshops is included in CIMEC deliverable D4.4 'City Pool report'.

## CITY POOL WORKSHOP #1

The first CIMEC City Pool workshop was held in London, March 3, 2016, hosted by Transport for London.

This was a joint event with the CODECS project, and also back-to-back with the final event of the H2020 Vruits project, drawing 55 participants from a wide range of cities and stakeholders.

The main points of discussion were city requirements for C-ITS as well as supplier and vehicle manufacturer expectations.


Figure 13: CIMEC City Pool workshop #1 Programme

## CITY POOL WORKSHOP #2

The second CIMEC City Pool workshop was held in Barcelona, November 14, 2016. The workshop was a joint event with the CODECS project, and hosted by CODECS partner RACC (Reial Automòbil Club de Catalunya). The workshop was attended by more than 50 participants, of which one half were representing local government. The workshop was scheduled back-to-back with a workshop in the H2020 Maven project on November 15, 2016, and also coinciding with the Smart Cities world congress held in Barcelona the same week. The workshop programme included discussions on the potential for C-ITS deployment in the urban environment.

## CITY POOL WORKSHOP #3

The third and final CIMEC City Pool workshop was held in Brussels, May 18, 2017, immediately after the CIMEC Final conference, hosted by the Brussels Representation of State of Hessen. The event was designed for open and interactive discussion about how to create a CIMEC legacy and the way forward for C-ITS and cities, with two key questions for the audience:

- Do you see potential for the CIMEC findings to be used locally/nationally?
- How would you like to see C-ITS developments moving forward at European and national?

Comments were made that the Roadmap, including its summarised version (booklet)

- offers excellent insight to the local authority perspective on C-ITS, and provides a useful document to inform the wider C-ITS community about the challenges of implementing C-ITS and to hopefully inform the future direction of C-ITS developments.

- offers a useful tool to reach out to the wider local authority community, the majority of which are not involved in C-ITS and may even have limited expertise and experience of more traditional ITS.

Several questions were raised during the discussions, including:

- the role of the national level in stimulating C-ITS discussion and coordinating activities
- how to 'sell' C-ITS to local authorities
- what role local authorities should play, if any, with regards to C-ITS deployment
- how to upscale, from a small-scale pilot or wider scale deployment
- how to ensure that the intended end users actually use the C-ITS Service

#### CONTINUED CITY POOL ACTIVITY AFTER CIMEC CLOSES?

The scale of involvement of local authorities in the City Pool is rather unique. CIMEC partners are not aware of any other European C-ITS project that has mobilised such a great number of local authorities. Given the success of the City Pool, it is a shame to see it stop now that CIMEC has come to an end, particularly as the urban C-ITS momentum is growing. To enable some continuity, there is the opportunity to hold another City Pool workshop in Autumn 2017 in the context of the CODECS project, which runs until April 2018. Some preliminary discussions are also underway with other new projects, such as C-the difference.

However, projects are temporary solutions for a City Pool, in that they can support this for the duration of the project only, and where funds are available. A longer-term platform for sharing experiences and facilitating discussion would be beneficial.

### 4.3.2. Workshops and events

CIMEC has been organising its own dissemination events as well as taking advantage of other established events, including those events organized by the partners.

#### CIMEC WORKSHOPS

During the project lifetime CIMEC has hosted 15 local regional and Europe-wide workshops primarily involving city authorities and stakeholders, and hosted/organised activities at three events involving suppliers (overview in Table 9).

The CIMEC workshops have proved useful in engaging with other local authorities, suppliers and other ITS stakeholders and were widely appreciated, especially by those people not involved in European research projects and therefore not active in the European C-ITS community. The regional/national and European workshops were particularly valued by participants and opportunities will be sought to keep this momentum going beyond the life of the project.

## CIMEC FINAL EVENT

The conference marking the end of the CIMEC project was full of lively discussion and general interaction. Some 80 people attended the event, held in Brussels on 18 March, including many representatives of local government – the main project target group.

The conference programme invited contributions from people outside the project, including the sister project CODECS and newly starting projects as well as the Dutch transport department and the EC.

The conference was followed immediately by the CIMEC city pool workshop, which essentially entailed just over one hour of free discussion about how to build on the CIMEC findings and what next for C-ITS and cities.

Table 9: Overview of workshops and events/activities organised by CIMEC

| Event/activity | Date | Location |
|---|---|---|
| **WP1 Workshops:** | | |
| Local city workshop, Reading | January 13, 2016 | Reading |
| Regional workshop, UK | January 13, 2016 | Reading |
| Local city workshop, Kassel | February 1, 2016 | Kassel |
| Regional workshop, German | February 2, 2016 | Kassel |
| Local city workshop, Trondheim | February 16, 2016 | Trondheim |
| Local city workshop, Bilbao | February 18, 2016 | Bilbao |
| Regional workshop, Spanish/French | February 19, 2016 | Bilbao |
| Regional workshop, Nordic | March 10, 2016 | Oslo |
| **WP2 Workshops/visited events:** | | |
| Workshop at ITS Norway[5], annual national conference | March 9, 2016 | Oslo |
| Organised interviews at Intertraffic[6], congress and exhibition | April 5-6, 2016 | Amsterdam |
| Standardisation workshop | September 12, 2016 | Brussels |
| **WP3 Workshops:** | | |
| Roadmap workshop, Nordic | February 8, 2017 | Trondheim |
| Roadmap workshop, German | February 21, 2017 | Kassel |
| Roadmap workshop, Spanish | March 2, 2017 | Bilbao |
| Roadmap workshop, UK | March 21, 2017 | Reading |
| **WP4 workshops (City Pool):** | | |
| CODECS-CIMEC City pool Workshop #1 | March 3, 2016 | London |
| CODECS-CIMEC City pool Workshop #2 | November 14, 2016 | Barcelona |
| CIMEC City pool Workshop #3 | May 18, 2017 | Brussels |
| **CIMEC Final event** | May 18th 2017 | Brussels |

[5] http://its-norway.no/

[6] http://www.intertraffic.com/

### EXTERNAL NETWORKING

Many of the CIMEC partners have a wide international, national or regional reach, and have undertaken dedicated actions to promote CIMEC within their respective networks and to build an urban C-ITS community:

- AlbrechtConsult (the secretariat of the German-speaking Open Cities Association)
- Centaur Consulting (Director the UK's Universal Traffic Management & Control initiative)
- MLC (representing ITS players within the Basque region)
- NPRA (representing public roads authorities in cities across Norway; member of CEDR, NVF)
- POLIS (representing cities across Europe; involved in several EU-projects; other European city networks; industry networks, e.g. C2C; sector networks, e.g. UITP)

CIMEC partners are also members of a range of relevant national and regional associations (ITS, transport, government), and active in activities such as:

- C-ITS Platform Urban WG meetings: POLIS, AlbrechtConsult, CentaurConsulting
- CEN TC 278 WG17 (urban ITS): POLIS, AlbrechtConsult, CentaurConsulting, SINTEF
- CEN project PT1701 (pre-study on urban ITS standards, now completed): POLIS, AlbrechtConsult, CentaurConsulting
- Amsterdam Group: POLIS
- H2020 and CEF funded projects : POLIS, AlbrechtConsult, NPRA, SINTEF

## 4.3.3. CIMEC stakeholder database

For the promotion of CIMEC, the project partners, most notably Polis, OCA and UTMC, have made use of their own contact databases, consisting of a large number of transport stakeholder contacts from all over Europe, from different sectors (public institutions, research, industry, consultants) and from different levels (European, national, regional, local).

Experts involved in other relevant European projects have also been included, and other initiatives, platforms and networks have been approached to further enhance dissemination. This includes liaising with the CIVITAS initiative, the urban mobility portal Eltis and the EC initiative EIP - Smart Cities and Communities.

The database has been further extended with the interested audience that actively subscribes to the project newsletter through the website's newsletter sign-up function and to CIMEC events.

## 4.4. Exploitation of results

The full description of plans for exploiting CIMEC outcome is given in CIMEC deliverable 4.3 'Exploitation plan'.

Main exploitable findings and outputs include:

- city views and requirements on C-ITS
- supplier market readiness for C-ITS
- standardisation status and recommendations
- C-ITS Roadmap for cities
- new urban C-ITS dynamics created

### 4.4.1. Main mechanisms for take-up of CIMEC outcome

CIMEC partners are members of/active in a range of initiatives relevant for continued take-up of CIMEC outcome:

#### EUROPEAN LEVEL

- EC C-ITS Deployment Platform - Urban WG
- CEN TC 278 WG17 (urban ITS)
- ETSI ITS Committee
- Amsterdam Group
- H2020 projects
- CEF projects and other cross-border deployment initiatives
- City Networks (POLIS, Eurocities, EMTA, CIVITAS)
- National road authorities (CEDR)
- Industry networks (C2C, Eucar, Clepa)
- Sector networks (UITP, EMTA, EPA)
- Events (ETC, ECOMM, POLIS conference etc)

#### NATIONAL LEVEL

- Member States (mainly CIMEC partners countries)
- Local government associations (mainly CIMEC partners countries)
- Transport associations/bodies
- National ITS bodies

#### LOCAL LEVEL

- Local authorities and stakeholders
- Local C-ITS projects

### 4.4.2. Exploitation by CIMEC partners

All CIMEC partners have provided separate description of how they foresee to conduct further exploitation of the CIMEC outcome (in D4.3 'Exploitation plan').

The project partners foresee a range of activities and actions to exploit CIMEC findings and output, including:

- Disseminate findings on requirements, challenges, priorities and technology issues to available arenas and networks
- Disseminate findings through website and newsletters
- Distribute printed brochure (based on roadmap)
- Take findings to policymakers and advise on emerging C-ITS strategy and programmes
- Transfer findings (including key project reports) to relevant bodies and forums
- Make use of findings, especially on realistic and high priority use cases, to relevant standardisation activities
- Use learning in research or consultancy advice given to clients and other contacts (for example, within the public transport context)
- Use learning as input to research programmes, tender specifications, consultation responses, etc.
- Working together with the other project partners to develop a non-academic road map, but a road map for C-ITS that is in step with actual practice (bringing in a lot of own needs and influence)
- Maintain dialogue with other CIMEC partners towards a coherent C-ITS deployment in Europe
- Maintain dialogue with wider contacts (EC, other specific H2020 projects, community groups, stakeholders within cities/companies/universities, etc.) in case of future C-ITS-related opportunities
- Use outputs to inform internal company thinking regarding next-level connectivity issues, in particular personal technologies, instrumented cities and automated vehicles
- Implement the roadmap into ITS processes
- Verify the roadmap by including the roadmap in the work within national ITS-pilots
- Test the roadmap in projects related to automated driving, these projects involve a lot of stakeholders and standardisation and will meet many of the barriers from the findings in CIMEC
- Share with surrounding cities and local, regional and if possible national administrations the main findings of CIMEC project
- Utilise CIMEC roadmap as a basis to create a live document of use cases, C-ITS experiences, architecture and business models to share
- Use the new knowledge of cities' requirements to support projects and activities working with urban/inter-urban road traffic challenges

# REFERENCES

## CIMEC PUBLIC DELIVERABLES AVAILABLE FROM WEBSITE:

(the most important highlighted)

**CIMEC deliverable D1.1 'City status and requirements for C-ITS deployment'**

CIMEC deliverable D2.1 'Contact database on cities' ITS suppliers'

CIMEC deliverable D2.2 'Suppliers' ambitions and expectation' (Extended version of CIMEC D2.1)

**CIMEC deliverable D2.3 'Supplier workshops'**

CIMEC deliverable D2.4 'C-ITS standard requirements for the urban environment'

**CIMEC deliverable D2.5 'C-ITS standard requirements for the urban environment'** (Extended version of CIMEC D2.4)

CIMEC deliverable D3.1 'Framework for Roadmap'

CIMEC deliverable D3.2 'Draft Roadmap'

**CIMEC deliverable D3.3 'Final Roadmap'**

CIMEC deliverable D4.1 'Dissemination strategy including project identity'

**CIMEC deliverable D4.2 Website (http://cimec-project.eu/)**

**CIMEC deliverable D4.3 'City Pool Report'**

CIMEC deliverable D4.4 'Exploitation plan'

**CIMEC deliverable D5.3 'Final project report'**

# APPENDIX 1 CIMEC PARTNERS AND CONTACTS

| | | |
|---|---|---|
| **Representing Cities:** | | |
| Bilbao (ES) | mlc – its euskadi | Nerea Rojas, Silvia Murga |
| Kassel (DE) | Dokumenta Stadt Kassel | Thorsten Miltner, Bernd Noll |
| Reading (UK) | Reading Borough Council | Simon Beasley, Lyndon George<br>Rob McDonald (Peter Brett Associates) |
| Trondheim (NO) | NPRA | Per Einar Pedersli, Erik Olsen |
| **Wp leaders:** | | |
| WP1 & WP5 | SINTEF | Hans Westerheim, Kristin Ystmark Bjerkan (WP1)<br>Solveig Meland (Coordinator) |
| WP2 | AlbrechtConsult | Hanfried Albrecht, Osama, Al-Gazali, Josef Kaltwasser |
| WP3 | Centaur Consulting | Mark Cartwright, Leslie Knoop |
| WP4 | POLIS | Suzanne Hoadley, Giacomo Lozzi |