

## Compass4D

**Compass4D** (Cooperative Mobility Pilot on Safety and Sustainability Services for Deployment) is a 3 year EU-funded project under the programme of Competitiveness and Innovation (CIP).

**Partners:** ERTICO (Coordinator), City of Copenhagen, City of Helmond, City of Newcastle, City of Vigo, City of Verona, Region of Central Macedonia, CETH, CTAG, ESYCSA, EUROTAXI, FIA, GEOLOC, ICCS, Idiada, IFSTTAR, INFOTRIP, IRU Projects, MAT Traffic, MEDDE, Siemens, Swarco Mizar, Peek NL, Peek DK, Imtech-ITS, Telecom Italia, TOPOS, TNO, Vialis, Vitrasa, V-TRON, University of Newcastle.

The objective of Compass4D is to target the improvement of road safety, increased energy efficiency and reducing congestion for road transport. These goals will be achieved by the concrete and sustainable deployment of Cooperative Intelligent Transport Systems in 7 European cities (Bordeaux, Copenhagen, Helmond, Newcastle, Thessaloniki, Verona & Vigo). These cities, together with the other partners of the project, will jointly implement three cooperative solutions:

1. Energy Efficiency Intersection Service (EEIS), allowing the driver to choose a fuel-saving and comfortable speed profile to cross the intersection efficiently.
2. Forward Collision Warning (FCW), in order to reduce road accidents by warning drivers about queuing traffic or other vehicles suddenly breaking/decelerating ahead.
3. Red Light Violation Warning (RLVW), to reduce the number of red light violations and to minimise the impacts of such violations (such as emergency vehicles crossing).

These services will be pre-deployed over one year of real life driving. Each of the pilot sites includes all the partners for a successful after-project life, from public authorities to infrastructure suppliers and users. The users group will include commercial vehicle, truck and taxi drivers, as well as private drivers.

<i>Vehicles / pilot site</i>	Bordeaux	Copenhagen	Helmond	Newcastle	Thessaloniki	Verona	Vigo	Total
<b>Trucks</b>	40		7	5 vans				<b>52</b>
<b>Cars</b>	34		25 electric	5 electric	7	10	10	<b>91</b>
<b>Buses</b>		100	5			10	20	<b>135</b>
<b>Emergency vehicles</b>	6		5				2	<b>13</b>
<b>Taxis</b>					35		8	<b>43</b>
<b>Total vehicles</b>	<b>80</b>	<b>100</b>	<b>42</b>	<b>10</b>	<b>42</b>	<b>20</b>	<b>40</b>	<b>334</b>

**Compass4D cooperative vehicles per pilot site**

Compass4D has a structure characterised by different phases that guarantee a smooth deployment of the services.

1. The project management part ensures high-quality administration of the processes as well as an efficient coordination of the consortium.
2. The implementation package aims to prepare Compass4D services for deployment in the pilot sites and ready them for evaluation.
3. The operational phase is structured in 4 plans: it will start by a preparation phase, and define a coordinated approach for all the pilots' sites. Subsequently, a baseline will be established for each site. Finally, followed by running the fully functional systems.

4. The Evaluation framework which defines the experimental design and assess the different applications at the pilots' sites. The overall aim is to evaluate the impact of V2V (Vehicle-to-Vehicle), V2I (Vehicle-to-Infrastructure) based on real life conditions.
5. The dissemination activities aiming at raising public awareness about the project and to facilitate the deployment of the piloted ITS services.
6. The deployment enablers will guarantee the development of an extensive business model, exploitation plan and cost-benefit analysis in order to guarantee a wider and future deployment of the project.

The implementation in each city will be in line with their demands and needs.

**Bordeaux (France):** the Bordeaux pilot will be implemented in close collaboration with Volvo Technology, the French Ministry of Transport, Geoloc Systems and TOPOS.

The site includes urban and interurban pilots: the urban pilot is located in an area with heavy traffic mainly because of large infrastructure and a large commercial zone. The circulation is difficult, both for cars and delivery trucks as the cars go to the large commercial area but also to the exhibition centre, the casino and soon, the new stadium whilst the delivery trucks distribute goods to many shops, especially two big ones, Auchan and IKEA. Interurban pilot: the ring road of Bordeaux presents several dangerous curves, which are prone to many incidents mainly due to poor visibility and sharp bends. These incidents often create major traffic jams and multi-vehicle incidents. These sites have been equipped with loop sensors and cameras in order to detect potential dangers and activate roadside danger signs or flashing lights. However, a more effective warning system could help to lower the number of accidents.

The pilot site team proposes to equip three dangerous curves with Road Site Units (RSU) in order to communicate information to the driver before entering the curve. The driver will be equipped with an On-Board Unit (OBU) to receive this information just before the curve and show it to the driver. Concerning the new equipment, RSU will be installed on 10 new urban intersections. RSU on 3 new inter urban intersections and OBU on 80 vehicles.

**Copenhagen (Denmark):** the section of road chosen for the pilot project in Copenhagen is a central bus connection running between Copenhagen Central Station, in the centre of Copenhagen, and past the important East Gate Station (Østerport), which is a hub for regional trains, commuter trains, the S-train and, from 2018, the Metro. A combined total of over 68,000 passengers pass through the two stations every day. For these reasons, the City of Copenhagen is extremely interested in implementing a project to reduce congestion and facilitate punctual or early arrival on this section of road.

In details, the equipment will be the following: 21 new RSU, 100 new OBU, 7 controller upgrades and 3 cameras. Moreover, 100 buses of the primary bus lines in the pilot site will be equipped with On Board Units, and 200 bus drivers will be using the ITS services.

**Newcastle (United Kingdom):** the Tyne and Wear pilot site is located in the North East region of England, comprises five local authority areas (Gateshead Council, Newcastle City Council, North Tyneside Council, South Tyneside Council and Sunderland City Council) and is home to over one million people.

20 intersections will be chosen. The routes used for Infrastructure to vehicle (I2V) communications to provide speed advice on approach to traffic signals to aid vehicles getting through on green, will be selected in consultation with Siemens, but from a traffic perspective, will be need to have free flowing traffic for the majority of the day so that speed choice is that of the driver and not dictated by congestion and have traffic signals with reasonable distance separation so that drivers have time to adjust their speed based on the information received.

**Thessaloniki (Greece):** the focus of the pilot activities in Thessaloniki will be the energy efficiency related technologies and the red light warning systems. Cooperative technologies both in the central

urban area of the city, as well as on the peripheral road network will be integrated into Thessaloniki's Urban Mobility Management System. The areas of the pilot activities will include Tsimiski Street, the main arterial of the entire city centre as well as major intersections with other arterials serving large numbers of daily traffic to and from the city centre. During a typical working day Tsimiski Street serves approximately 50,000 vehicles, 60% of which are through-traffic. Seven of the signal controlled intersections along Tsimiski Street will be equipped with Compass4D cooperative roadside units. In addition to Tsimiski Street, 7 major intersections in the wider area of the city will also be equipped with COMPASS4D roadside units.

**Verona (Italy):** the efficiency and safety applications that will be deployed and piloted in Verona are listed according to the city's priorities. Adaptations and extensions on basic applications and platform functionality, based on I2V (speed advice to drivers, in urban area; forward collision warning based on local traffic jam; red light violation). For the Compass4D project, part of Verona city centre will be considered in the pilot, in particular the main corridor and arteries where the cooperative RSU are going to be installed: 25 cooperative ETSI G5 compliant RSUs will be installed along the route; OBUs for 20 vehicles (10 buses and 10 municipal vehicles); 2 Cameras for the safety application; 30 vehicles users will be selected by the city of Verona to make tests using smart phones or tablets that use 3G/LTE communication. This will enable the city to provide some cooperative services also in the road network where the RSUs are not equipped with G5.

**Vigo (Spain):** the route selected for piloting the Compass4D services crosses the entire city centre and connects two of the main entrances to the city: AP-9 and A-55 highways. This route was selected because the conditions for testing these services will be optimal and the city council is really interested in witnessing the positive effects of Compass4D services in this area. In general, as it is located in city centre, the traffic conditions will be adequate for the tests and the number of buses driven through these roads is high in comparison with other areas in the city, allowing the collection of a high amount of data for evaluation purposes. The number of intersections equipped will be 17 and the system will be tested by 40 vehicles (buses, taxis, private vehicles and emergency vehicles).