Horizon 2020

Call: H2020-ICT-2015

Topic: ICT-10-2015

Type of action: RIA

Proposal number: 687959

Proposal acronym: CROWD4ROADS

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How to fill in the forms

The administrative forms must be filled in for each proposal using the templates available in the submission system. Some data fields in the administrative forms are pre-filled based on the previous steps in the submission wizard.

Proposal ID **687959** *Acronym* **CROWD4ROADS**

1 - General information

Topic ICT-10-2015 Type of action RIA

Call identifier H2020-ICT-2015 Acronym CROWD4ROADS

Proposal title* CROWD sensing and ride sharing FOR ROAD Sustainability

Note that for technical reasons, the following characters are not accepted in the Proposal Title and will be removed: < > " &

Duration in months *36*

Fixed keyword 1	*Collective Awareness Platforms*	Add	
Fixed keyword 2	*Participatory Innovation*	Add	Remove
Fixed keyword 3	*Collaborative and social computing*	Add	Remove
Fixed keyword 4	*Digital Social Innovation*	Add	Remove
Fixed keyword 5	*Behavioural change campaigns*	Add	Remove

Free keywords *Crowd sensing, Trip sharing, Road monitoring, Car occupancy rate*

Abstract

Road networks are the largest publicly owned assets and they play a fundamental role in socio-economic development and competitiveness. At the same time, roads have huge environmental impacts and maintenance costs. Passenger cars account for 73.7% of total intra-EU passenger transport, with an average car occupancy rate well below 2 passengers per car. The resulting traffic accounts for about 12% of CO2 emissions. Delayed maintenance impairs road safety and increases cost of intervention, vehicle operating costs, and emissions.
The CROWD4ROADS project combines trip sharing and crowd sensing initiatives to harness collective intelligence to contribute
to the solution of the sustainability issues of road passenger transport, by increasing the car occupancy rate and by engaging drivers and passengers in road monitoring.
BlaBlaCar (http://blablacar.com/) is the largest trusted ride sharing community worldwide, with more than 10.000.000 members in 14 countries, while SmartRoadSense (http://smartroadsense.it/) is a crowd sensing system which makes use of the accelerometers of car-mounted smartphones to estimate the roughness of the road surface.
The CROWD4ROADS platform establishes a synergistic relationship between BlaBlaCar and SmartRoadSense, exploiting the network effect which is inherent in both the initiatives, to provide a sizeable impact in terms of car occupancy rate, road monitoring, and end-user engagement in road maintenance and transport sustainability.
Scalability issues will be addressed during the project both from a technical and from a social point of view. The approach will be validated on representative large scale pilots, involving more than 1 million people and covering more than 1 million km of roads. Impacts will be measures in terms of road coverage, car occupancy rates, and open data volume.

Remaining characters 158

Has this proposal (or a very similar one) been submitted in the past 2 years in response to a call for proposals under the 7th Framework Programme, Horizon 2020 or any other EU programme(s)? ○ Yes ◉ No

Proposal ID **687959** *Acronym* **CROWD4ROADS**

Declarations

1) The coordinator declares to have the explicit consent of all applicants on their participation and on the content of this proposal.	☒
2) The information contained in this proposal is correct and complete.	☒
3) This proposal complies with ethical principles (including the highest standards of research integrity — as set out, for instance, in the European Code of Conduct for Research Integrity — and including, in particular, avoiding fabrication, falsification, plagiarism or other research misconduct).	☒

4) The coordinator confirms:

- to have carried out the self-check of the financial capacity of the organisation on https://ec.europa.eu/research/participants/portal/desktop/en/organisations/lfv.html or to be covered by a financial viability check in an EU project for the last closed financial year. Where the result was "weak" or "insufficient", the coordinator confirms being aware of the measures that may be imposed in accordance with the H2020 Grants Manual (Chapter on Financial capacity check); or	○
- is exempt from the financial capacity check being a public body including international organisations, higher or secondary education establishment or a legal entity, whose viability is guaranteed by a Member State or associated country, as defined in the H2020 Grants Manual (Chapter on Financial capacity check); or	◉
- as sole participant in the proposal is exempt from the financial capacity check.	○

5) The coordinator hereby declares that each applicant has confirmed:

- they are fully eligible in accordance with the criteria set out in the specific call for proposals; and	☒
- they have the financial and operational capacity to carry out the proposed action.	☒

The coordinator is only responsible for the correctness of the information relating to his/her own organisation. Each applicant remains responsible for the correctness of the information related to him and declared above. Where the proposal to be retained for EU funding, the coordinator and each beneficiary applicant will be required to present a formal declaration in this respect.

According to Article 131 of the Financial Regulation of 25 October 2012 on the financial rules applicable to the general budget of the Union (Official Journal L 298 of 26.10.2012, p. 1) and Article 145 of its Rules of Application (Official Journal L 362, 31.12.2012, p.1) applicants found guilty of misrepresentation may be subject to administrative and financial penalties under certain conditions.

Personal data protection

Your reply to the grant application will involve the recording and processing of personal data (such as your name, address and CV), which will be processed pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. Unless indicated otherwise, your replies to the questions in this form and any personal data requested are required to assess your grant application in accordance with the specifications of the call for proposals and will be processed solely for that purpose. Details concerning the processing of your personal data are available on the privacy statement. Applicants may lodge a complaint about the processing of their personal data with the European Data Protection Supervisor at any time.

Your personal data may be registered in the Early Warning System (EWS) only or both in the EWS and Central Exclusion Database (CED) by the Accounting Officer of the Commission, should you be in one of the situations mentioned in:
-the Commission Decision 2008/969 of 16.12.2008 on the Early Warning System (for more information see the Privacy Statement), or
-the Commission Regulation 2008/1302 of 17.12.2008 on the Central Exclusion Database (for more information see the Privacy Statement) .

Proposal ID **687959** *Acronym* **CROWD4ROADS**

List of participants

#	Participant Legal Name	Country
1	Universita' degli Studi di Urbino Carlo Bo	Italy
2	REGIONE MARCHE	Italy
3	Comuto Sa	France
4	COVENTRY UNIVERSITY	United Kingdom
5	FUNDATIA SATEAN	Romania
6	Buckinghamshire Advantage	United Kingdom
7	Regione Abruzzo	Italy

Proposal ID **687959** *Acronym* **CROWD4ROADS** *Short name* **UNIURB**

2 - Administrative data of participating organisations

PIC	***Legal name***
997437906	*Universita' degli Studi di Urbino Carlo Bo*

Short name: UNIURB

Address of the organisation

Street Via Aurelio Saffi 2

Town URBINO

Postcode 61029

Country Italy

Webpage www.uniurb.it

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... yes

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2014 - no

SME self-assesment ..... unknown

SME validation sme ..... 2007 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE code 853 -

Proposal ID **687959**	*Acronym* **CROWD4ROADS**	*Short name* **UNIURB**

Department(s) carrying out the proposed work

Department 1

Department name	Dipartimento di Scienze di Base e Fondamenti
	☐ Same as organisation address
Street	Piazza della Repubblica, 13
Town	Urbino
Postcode	61029
Country	Italy

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **687959** *Acronym* **CROWD4ROADS** *Short name* **UNIURB**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Alessandro** Last name: **Bogliolo**

E-Mail: **alessandro.bogliolo@uniurb.it**

Position in org.: Associate Professor

Department: DiSBeF

[ ] Same as organisation address

Street: Piazza della Repubblica, 13

Town: Urbino Post code: 61029

Country: Italy

Website: http://informatica.uniurb.it/

Phone: +390722304410 Phone 2: +393480979889 Fax: +3907224475

Proposal ID **687959** *Acronym* **CROWD4ROADS** *Short name* **MARCHE REGION**

PIC	***Legal name***
986340233	*REGIONE MARCHE*

Short name: MARCHE REGION

Address of the organisation

Street .

Town .

Postcode

Country Italy

Webpage WWW.REGIONE.MARCHE.IT

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes
Non-profit ..... yes
International organisation ..... no
International organisation of European interest ..... no
Secondary or Higher education establishment ..... no
Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown
SME self-assesment ..... unknown
SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE code 84 -

Proposal ID **687959**	*Acronym* **CROWD4ROADS**	*Short name* **MARCHE REGION**

Department(s) carrying out the proposed work

Department 1

Department name	PF Sistemi Informativi e Telematici
	☐ Same as organisation address
Street	via Tiziano 44
Town	Ancona
Postcode	60125
Country	Italy

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **687959** *Acronym* **CROWD4ROADS** *Short name* **MARCHE REGION**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: ○ Male ◉ Female

First name **Serenella** Last name **Carota**

E-Mail **serena.carota@regione.marche.it**

Position in org.: Executive Director

Department: PF Sistemi Informativi e Telematici

☐ Same as organisation address

Street: via Tiziano 44

Town: Ancona Post code: 60125

Country: Italy

Website: http://www.regione.marche.it/

Phone: +390718063500 Phone 2: +390718063915 Fax: +390718063071

Other contact persons

First Name	*Last Name*	*E-mail*	*Phone*
Andrea	Sergiacomi	andrea.sergiacomi@regione.marche.it	+390718063504

Proposal ID **687959** *Acronym* **CROWD4ROADS** *Short name* **Comuto Sa**

PIC	***Legal name***
929226730	*Comuto Sa*

Short name: Comuto Sa

Address of the organisation

Street avenue de la republique 84

Town Paris

Postcode 75011

Country France

Webpage www.BlaBlaCar.it

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... unknown

Non-profit ..... unknown

International organisation ..... unknown

International organisation of European interest ..... unknown

Secondary or Higher education establishment ..... unknown

Research organisation ..... unknown

Legal person ..... no

Enterprise Data

SME self-declared status ..... 2014 - yes

SME self-assesment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

NACE code

Proposal ID **687959**	*Acronym* **CROWD4ROADS**	*Short name* **Comuto Sa**

Department(s) carrying out the proposed work

Department 1

Department name	Communication
	☐ Same as organisation address
Street	Avenue de la Republique 84
Town	Paris
Postcode	75011
Country	France

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **687959** *Acronym* **CROWD4ROADS** *Short name* **Comuto Sa**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Franco** Last name: **Lo Giudice**

E-Mail: **franco.logiudice@blablacar.com**

Position in org.: Community and event manager

Department: Communication

☒ Same as organisation address

Street: avenue de la republique 84

Town: Paris Post code: 75011

Country: France

Website: http://www.blablacar.it

Phone: +390287188766 Phone 2: *+xxx xxxxxxxxx* Fax: *+xxx xxxxxxxxx*

Proposal ID **687959**	*Acronym* **CROWD4ROADS**	*Short name* **COVENTRY UNIVERSITY**

PIC	***Legal name***
999612161	*COVENTRY UNIVERSITY*

Short name: COVENTRY UNIVERSITY

Address of the organisation

Street PRIORY STREET

Town COVENTRY

Postcode CV1 5FB

Country United Kingdom

Webpage www.coventry.ac.uk

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... yes

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2012 - no

SME self-assesment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE code 853 -

Proposal ID **687959**	*Acronym* **CROWD4ROADS**	*Short name* **COVENTRY UNIVERSITY**

Department(s) carrying out the proposed work

Department 1

Department name	Disruptive Media Learning Lab
	☒ Same as organisation address
Street	PRIORY STREET
Town	COVENTRY
Postcode	CV1 5FB
Country	United Kingdom

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **687959**	*Acronym* **CROWD4ROADS**	*Short name* **COVENTRY UNIVERSITY**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. | Sex: (•) Male ( ) Female

First name: **Sylvester** | Last name: **Arnab**

E-Mail: **s.arnab@coventry.ac.uk**

Position in org.: Senior Research Fellow

Department: Disruptive Media Learning Lab

☒ Same as organisation address

Street: PRIORY STREET

Town: COVENTRY | Post code: CV1 5FB

Country: United Kingdom

Website: http://www.coventry.ac.uk/

Phone: +44(0)7795818977 | Phone 2: +xxx xxxxxxxxx | Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Yvonne	Morgan	yvonne.morgan@coventry.ac.uk	

Proposal ID **687959** *Acronym* **CROWD4ROADS** *Short name* **FUNDATIA SATEAN**

PIC	***Legal name***
952952057	*FUNDATIA SATEAN*

Short name: FUNDATIA SATEAN

Address of the organisation

Street CALEA CALARASILOR 15 BL 1

Town BRAILA

Postcode 810008

Country Romania

Webpage www.satean.ro

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2012 - no

SME self-assesment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE code 93 - Other service activities

Proposal ID **687959**	*Acronym* **CROWD4ROADS**	*Short name* **FUNDATIA SATEAN**

Department(s) carrying out the proposed work

Department 1

Department name	EU Project Department
	☒ Same as organisation address
Street	CALEA CALARASILOR 15 BL 1
Town	BRAILA
Postcode	810008
Country	Romania

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **687959** *Acronym* **CROWD4ROADS** *Short name* **FUNDATIA SATEAN**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Giorgio** Last name: **Guidi**

E-Mail: **giorgio.guidi@sidagroup.com**

Position in org.: Executive Director

Department: EU Project Department

☒ Same as organisation address

Street: CALEA CALARASILOR 15 BL 1

Town: BRAILA Post code: 810008

Country: Romania

Website: http://www.satean.ro/

Phone: +40239620212 Phone 2: *+xxx xxxxxxxxx* Fax: +40239620212

Proposal ID **687959**	*Acronym* **CROWD4ROADS**	*Short name* **Buckinghamshire Advantage**

PIC	***Legal name***
929247876	*Buckinghamshire Advantage*

Short name: Buckinghamshire Advantage

Address of the organisation

Street THE SAUNDERTON ESTATE, WYCOMBE ROA

Town Saunderton

Postcode HP14 4BF

Country United Kingdom

Webpage

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2014 - yes

SME self-assesment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

NACE code

Proposal ID **687959**	*Acronym* **CROWD4ROADS**	*Short name* **Buckinghamshire Advantage**

Department(s) carrying out the proposed work

Department 1

Department name	Smart Infrastructure
	☒ Same as organisation address
Street	THE SAUNDERTON ESTATE, WYCOMBE ROAD
Town	Saunderton
Postcode	HP14 4BF
Country	United Kingdom

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **687959**	*Acronym* **CROWD4ROADS**	*Short name* **Buckinghamshire Advantage**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Mr.

Sex: (•) Male ( ) Female

First name: **Jim**

Last name: **Sims**

E-Mail: **jim@btvlep.co.uk**

Position in org.: Development Manager

Department: Smart Infrastructure

☒ Same as organisation address

Street: THE SAUNDERTON ESTATE, WYCOMBE ROAD

Town: Saunderton

Post code: HP14 4BF

Country: United Kingdom

Website: www.buckstvlep.co.uk/interesting-stuff/buckinghamshire-advantage

Phone: +44(0)1494568951

Phone 2: +44(0)7740511976

Fax: *+xxx xxxxxxxxx*

Proposal ID **687959** *Acronym* **CROWD4ROADS** *Short name* **Regione Abruzzo**

PIC	***Legal name***
994604051	*Regione Abruzzo*

Short name: Regione Abruzzo

Address of the organisation

Street Via Leonardo da Vinci

Town L'Aquila

Postcode 67100

Country Italy

Webpage

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes
Non-profit ..... no
International organisation ..... no
International organisation of European interest ..... no
Secondary or Higher education establishment ..... no
Research organisation ..... no
Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown
SME self-assesment ..... unknown
SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE code L - Public administration & defence

Proposal ID **687959**	*Acronym* **CROWD4ROADS**	*Short name* **Regione Abruzzo**

Department(s) carrying out the proposed work

Department 1

Department name	Transport, Mobility, Tourism and Culture
	☐ Same as organisation address
Street	Corso Vittorio Emanuele II, nr. 301
Town	Pescara
Postcode	65122
Country	Italy

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **687959** *Acronym* **CROWD4ROADS** *Short name* **Regione Abruzzo**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. | Sex: ○ Male ◉ Female

First name: **Ester** | Last name: **Di Cino**

E-Mail: **ester.dicino@regione.abruzzo.it**

Position in org.: Administrative Officer

Department: Transport, Mobility, Tourism and Culture

☐ Same as organisation address

Street: Corso Vittorio Emanuele II, nr. 301

Town: Pescara | Post code:

Country: Italy

Website: 2) http://www.regione.abruzzo.it/portale/index.asp

Phone: +3908542900229 | Phone 2: *+xxx xxxxxxxxx* | Fax: +39085298246

Proposal ID **687959** *Acronym* **CROWD4ROADS**

3 - Budget for the proposal

No	Participant short name	Country	(A) Direct personnel costs/€	(B) Other direct costs/€	(C) Direct costs of sub-contracting/€	(D) Direct costs of providing financial support to third parties/€	(E) Costs of inkind contributions not used on the beneficiary's premises/€	(F) Indirect Costs / € (=0.25(A+B-E))	(G) Special unit costs covering direct & indirect costs / €	(H) Total estimated eligible costs / € (=A+B+C+D+F +G)	(I) Reimbursement rate (%)	(J) Max. grant / € (=H*I)	(K) Requested grant / €
1	Uniurb	IT	234 000	34 500	0	0	0	67125,00	0	335625,00	100	335625,00	335625,00
2	Marche Regio	IT	124 200	53 477	28 545	0	0	44419,25	0	250641,25	100	250641,25	250641,00
3	Comuto Sa	FR	102 500	15 000	0	0	0	29375,00	0	146875,00	100	146875,00	146875,00
4	Coventry Univ	UK	164 767	31 500	0	0	0	49066,75	0	245333,75	100	245333,75	245333,00
5	Fundatia Sate	RO	122 000	16 500	0	0	0	34625,00	0	173125,00	100	173125,00	173125,00
6	Buckinghams	UK	190 894	19 500	0	0	0	52598,50	0	262992,50	100	262992,50	262992,00
7	Regione Abru	IT	90 000	13 500	0	0	0	25875,00	0	129375,00	100	129375,00	129375,00
	Total		1 028 361	183 977	28 545	0	0	303084,50	0	1543967,50		1543967,50	1543966,00

Proposal ID **687959** *Acronym* **CROWD4ROADS**

4 - Ethics issues table

1. HUMAN EMBRYOS/FOETUSES		Page
Does your research involve Human Embryonic Stem Cells (hESCs)?	○ Yes ◉ No	
Does your research involve the use of human embryos?	○ Yes ◉ No	
Does your research involve the use of human foetal tissues / cells?	○ Yes ◉ No	
2. HUMANS		**Page**
Does your research involve human participants?	○ Yes ◉ No	
Does your research involve physical interventions on the study participants?	○ Yes ◉ No	
3. HUMAN CELLS / TISSUES		**Page**
Does your research involve human cells or tissues (other than from Human Embryos/ Foetuses, i.e. section 1)?	○ Yes ◉ No	
4. PERSONAL DATA (ii)		**Page**
Does your research involve personal data collection and/or processing?	○ Yes ◉ No	
Does your research involve further processing of previously collected personal data (secondary use)?	○ Yes ◉ No	
5. ANIMALS (iii)		**Page**
Does your research involve animals?	○ Yes ◉ No	

Proposal ID **687959** *Acronym* **CROWD4ROADS**

6. THIRD COUNTRIES		Page
Does your research involve non-EU countries?	○ Yes ◉ No	
Do you plan to use local resources (e.g. animal and/or human tissue samples, genetic material, live animals, human remains, materials of historical value, endangered fauna or flora samples, etc.)? (v)	○ Yes ◉ No	
Do you plan to import any material from non-EU countries into the EU? *For data imports, please fill in also section 4.* *For imports concerning human cells or tissues, fill in also section 3.*	○ Yes ◉ No	
Do you plan to export any material from the EU to non-EU countries? *For data exports, please fill in also section 4.* *For exports concerning human cells or tissues, fill in also section 3.*	○ Yes ◉ No	
If your research involves low and/or lower middle income countries, are benefits-sharing measures foreseen? (vii)	○ Yes ◉ No	
Could the situation in the country put the individuals taking part in the research at risk?	○ Yes ◉ No	
7. ENVIRONMENT & HEALTH and SAFETY See legal references at the end of the section. (vi)		Page
Does your research involve the use of elements that may cause harm to the environment, to animals or plants? *For research involving animal experiments, please fill in also section 5.*	○ Yes ◉ No	
Does your research deal with endangered fauna and/or flora and/or protected areas?	○ Yes ◉ No	
Does your research involve the use of elements that may cause harm to humans, including research staff? *For research involving human participants, please fill in also section 2.*	○ Yes ◉ No	
8. DUAL USE (vii)		Page
Does your research have the potential for military applications?	○ Yes ◉ No	
9. MISUSE		Page
Does your research have the potential for malevolent/criminal/terrorist abuse?	○ Yes ◉ No	
10. OTHER ETHICS ISSUES		Page
Are there any other ethics issues that should be taken into consideration? Please specify	○ Yes ◉ No	

Proposal ID **687959** *Acronym* **CROWD4ROADS**

I confirm that I have taken into account all ethics issues described above and that, if any ethics issues apply, I will complete the ethics self-assessment and attach the required documents. ☒

How to Complete your Ethics Self-Assessment

Proposal ID **687959** *Acronym* **CROWD4ROADS**

5 - Call specific questions

Open Research Data Pilot in Horizon 2020

If selected, all applicants will participate in the Pilot on Open Research Data in Horizon 2020[1] , which aims to improve and maximise access to and re-use of research data generated by actions. Participating in the Pilot does not necessarily mean opening up all research data. Actions participating in the Pilot will be invited to formulate a Data Management Plan in which they will determine and explain which of the research data they generate will be made open.

Applicants have the possibility to opt out of this Pilot and must indicate a reason for this choice.

Participation in this Pilot does not constitute part of the evaluation process. Proposals will not be evaluated favourably because they are part of the Pilot and will not be penalised for opting out of the Pilot.

We wish to opt out of the Pilot on Open Research Data in Horizon 2020.	○ Yes	◉ No

[1] *According to article 43.2 of Regulation (EU) No 1290/2013 of the European Parliament and of the Council, of 11 December 2013, laying down the rules for participation and dissemination in "Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020)" and repealing Regulation (EC) No 1906/2006.*

Data management activities

The use of a Data Management Plan (DMP) is required for projects participating in the Open Research Data Pilot in Horizon 2020, in the form of a deliverable in the first 6 months of the project.

All other projects may deliver a DMP on a voluntary basis, if relevant for their research.

Are data management activities relevant for your proposed project?	◉ Yes	○ No

A Data Management Plan will be delivered (Please note: Projects participating in the Open Research Data Pilot **must** include a Data Management Plan as a deliverable in the first 6 months of the project).	☒
Data Management is part of a Work Package.	☒
Data Management will be integrated in another way.	☐

CROWD4ROADS

CROWD sensing and trip sharing FOR ROAD Sustainability

Proposal
(technical annex)

Research and Innovation actions

CROWD4ROADS - CROWD sensing and trip sharing FOR ROAD Sustainability

List of participants

Participant No *	Participant organisation name	Country
1 (Coordinator)	UNIURB - Università degli Studi di Urbino Carlo Bo	Italy
2	MAR - Regione Marche	Italy
3	COMUTO – Comuto SA	France
4	COVUNI – Conventry University	United Kingdom
5	SATEAN – Fundatia Satean	Romania
6	BUCKADV – Buckinghamshire Advantage	United Kingdom
7	ABR – Regione Abruzzo	Italy

* Please use the same participant numbering as that used in the administrative proposal forms.

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1 Excellence

1.1 Objectives

The project combines and enhances existing trip sharing and crowd sensing initiatives to harness collective intelligence, contributing to the solution of two well-known sustainability issues of road passenger transport: namely, low car occupancy rate and delayed road maintenance.

Roads are often the single largest publicly owned national asset. The road infrastructure and its conditions provide a fundamental foundation to the performance of all national economies, delivering a wide range of economic and social benefits. Road transport accounts an average of 4% of GDP by itself, while the overall contribution of the road infrastructure to national economies lies between 10% and 20%. In 2012, 92.5% of inland passenger transport [EUST_PTS14] and 75.1% of inland freight transport [EUST_FTS14] in EU-28 countries went on roads. Passenger cars account for 73.7% of total intra-EU passenger transport [EC12].

Road maintenance is essential for safety, wellbeing, economy, and environment. The main principle driving the need for maintenance is that spending money now avoids higher costs in the future. According to the World Road Association, low income countries, which under invest, spend 50% more on the road network (per kilometre) than higher income countries [WRA14]. Moreover, the World Bank has shown that delayed road maintenance increases the total vehicle operating cost by two to three times the savings in maintenance. Inadequate maintenance places undue financial burden on future generation, impairing sustainability.

SITEB has provided a careful estimate of the total value of the upper structure of the Italian roads, coming to the astonishing figure of 1,250 Billion Euros [SITEB12]. Road decay can be stopped only with preservation and well planned maintenance actions; this is the only way to preserve such an immense asset. The same report shows how the delay in maintenance impacts maintenance costs, providing the economic motivation for the adoption of maintenance policies based on real-time data and sound models. On its turn, the need for up-to-date comprehensive data prompts for the development of non-intrusive inspection and monitoring techniques, causing no impairment to transport flows [ERTRAC13]. Regular monitoring and reporting is essential for maintenance programming.

On the other hand, road traffic has a non-negligible environmental impact in terms of noise, pollution, and energy. Passenger cars alone account for 12% of CO2 emissions in EU [EC15]. According to the Europe Environment Agency, car occupancy rates decrease over time due to the drop in household size and to the increase in car ownership [EEA11]. The average occupancy rate is well below 2 passengers per car, and it approaches 1.1 for commuting. Car sharing and car-pooling initiatives [CIVITAS15] are essential, together with the adoption of less car-dependent lifestyles, to invert the car occupancy trend and reduce traffic congestion.

Collective awareness is essential both to induce and to accept the adoption of adequate policies. End-user engagement provides both a direct effect, allowing the community to benefit from the service provide by individuals, and an indirect effect, being for sure the most effective way of raising awareness.

The CROWD4ROADS project aims at engaging drivers and passengers in the development and adoption of more sustainable car usage habits and road maintenance policies. This is done by establishing a synergistic relationship between *BlaBlaCar*, the largest ride sharing community worldwide with more than 10 million users [BlaBlaCar], and *SmartRoadSense*, a crowd sensing system which exploits the accelerometers of car-mounted smartphones as non-intrusive sensors of road surface quality [SRS,SRS14,SRS14b,SRS15]. The network effect which is inherent in both the initiatives (together with their innovative nature and their technology readiness) is expected to create the conditions to make large-scale real-world pilots capable of providing a sizeable and scalable impact. At the same time, the development of an integrated platform poses challenging issues in terms of scalability and usage models that will be addressed within the project.

The objectives of the project include:

- Develop and deploy a scalable digital social platform combining community-scale trip sharing (namely, BlaBlaCar) and crowd sensing of road quality (namely, SmartRoadSense) in order to harness network effect and collective intelligence. **Measurable objective:** 10% increase of the adoption rates of BlaBlaCar and SmartRoadSense within the pilots.

- Empower citizens as active members of a network able to induce more sustainable car usage habits and better informed road maintenance decisions. **Measurable objectives:** increased activity of community members, measured in terms of trips shared and monitored kilometres per user per month. Increased usage of tags related with trip-sharing and crowd-sensing in social networks.

- Develop real-world pilots at urban, regional, and national scale, involving millions of people and covering millions of kilometres of roads. **Measurable objectives:** number of active users exceeding 1,000,000 people; monitored roads exceeding 1,000,000 kilometres.

- Provide to policy makers and public administrators up to date open data on the roughness of the road surface. **Measurable objective**: roughness indicators of at least 50% of the monitored roads updated at least once per year.

- Provide to policy makers and public administrators gamification and incentive mechanisms to be possibly applied on top of the social platform to motivate the participation of specific target groups into the project, in order to raise awareness on road sustainability issues and to engage drivers and passengers in road monitoring. **Measurable objective**: incentive measures spontaneously applied on top of the corwd4roads platform by at least two external stakeholders before the end of the project.

1.2 Relation to the work programme

1.2.1 Relation to the specific challenge

CROWD4ROADS addresses the specific challenge of the work programme by targeting the development and deployment of a large scale digital social platform combining people, sensors, and open data to harness collective intelligence to induce more sustainable car usage habits and more informed road maintenance policies.

Individual and collective awareness will be created by means of the direct engagement of citizens into the platform. The combination of two emerging community-scale initiatives, namely, BlaBlaCar and SmartRoadSense, has the potential of triggering a network effect that increases their penetration. In addition, incentive mechanisms and gamification techniques will be adopted to provide additional motivations.

1.2.2 Relation to the scope

The project is mainly focused on Scope a. **Collective awareness pilots for bottom-up participatory innovation paradigms.**

In fact, it targets the development and test of an innovative solution to two well-known sustainability challenges of road networks: the low occupancy rate of private cars and the lack of up to date comprehensive data supporting effective maintenance policies of the road network.

Pilots will be developed at different scales: at urban level in Pesaro and Rome, at regional level in Regione Marche and Buckinghamshire, at country level in Italy and Romania. Scaling up and replication will be tested within the project both by opening the platform to promote the sprouting of grassroots initiatives in other European countries, and by replicating in Regione Abruzzo the pilot developed by Regione Marche.

Pilots will be grounded on the SmartRoadSense technology developed and tested by UNIURB, complemented by the gamification techniques developed by COVUNI and by the cloud computing facilities made available by MAR, and on the community of BlaBlaCar users, complemented by the local communities targeted by city-wide and region-wide pilots.

The consortium is highly interdisciplinary, having only three of the seven partners (namely, UNIURB, COVUNI, and MAR) bringing mainly ICT competences and facilities into the project. The competences provided by all the partners are represented in Table 1, where a broad classification is provided between ICT and non-ICT competences. Open data represent a shared keyword that appears both in technical and

exploitation tasks. In fact, open data will play a central role in the project, being the liaison between the activities related with the development of the platform and the activities aimed at promoting its adoption and maximizing its impact. The composition of the consortium guarantees the direct involvement of local communities and grassroots initiatives.

	UNIURB	MAR	COMUTO	COVUNI	SATEAN	BUCKADV	ABR		
Policy making		x			x	x	x		non-ICT
Public administration		x				x	x		
Transportation		x	x			x	x		
Community management			x			x			
Communication	x		x		x	x			
Open data	x	x		x	x	x	x	ICT	
Gamification	x			x					
Cloud computing	x	x							
Mobile app dev.	x			x					
Algorithms	x			x					

Table 1. Competence map.

Declaration of interests to take part in the pilots and exploit the results of the project have been collected from many third parties. Their external participation achieves the two-fold goal of keeping the consortium compact while representing all the stakeholders of the road transport system.

1.3 Concept and approach

1.3.1 Overall Concept

The main idea behind CORWD4ROADS is to engage end-users, i.e., car drivers and passengers, in making road transport more sustainable. End-user engagement is achieved by combining two emerging grassroots initiatives that have proven effective: BlaBlaCar [BlaBlaCar], a trip sharing initiative that increases car occupancy rate, and SmartRoadSense [SRS,SRS15,SRS14b,SRS14], a crowd sensing system that exploits smartphones to collect accurate data on road conditions. Such grassroots initiatives are expected to provide a direct benefit both by inducing more sustainable and greener car usage patterns and by raising end-users' awareness on the conditions of the roads they travel. Moreover, they will harness collective intelligence to provide open data on the road conditions supporting better informed planning of road maintenance.

BlaBlaCar (http://bablacar.com/) is a trusted ridesharing system creating a match between passengers who need to travel and drivers with empty seats in their cars. Passengers who take a ride pay to the driver the agreed contribution to share travel expenses. BlaBlaCar is the largest trip sharing community worldwide, with more than 10.000.000 members in 18 countries.

SmartRoadSense (http://smartroadsense.it/) is an innovative crowd sensing system, which makes use of the accelerometers of car-mounted smartphones to estimate the roughness of the road surface. Roughness estimates are then collected by a server, aggregated, reported on a map, and released as open data. SmartRoadSense has been developed by the University of Urbino and by NeuNet cultural association in the last three years and it has been released in Italy on February 21, 2015. In the first month of activity the surface roughness has been automatically monitored on about 10,000 Km of roads, corresponding to more than 1% of the total Italian road network.

The combination of the two initiatives into the CROWD4ROADS platform is expected to trigger a network effect that adds to the popularity and speeds up the adoption rate of both of them. Moreover, it provides practical advantages coming from the complementarity of the two projects: i) it empowers both drivers and passengers by allowing them to contribute to monitor the state of the roads they travel; ii) it creates a word-of-mouth effect which can significantly speedup the adoption of SmartRoadSense and increase its popularity; iii) it raises a collective awareness on the advantages of sharing both data and services; iv) it creates the conditions for having SmartRoadSense running on multiple smartphones traveling on the same car, thus enhancing the accuracy of data.

From a technological stand-point, the project will be mainly focused on addressing usability and scalability issues. Moreover, gamification and reward mechanisms will be implemented to allow policy makers and

public administrations to use the platform to support targeted road monitoring and awareness raising campaigns.

The CROWD4ROADS ecosystem is represented in Figure 1. Red arrows represent end-users engagement in BlaBlaCar and SmartRoadSense. The self-loop represents the usage of CROWD4ROADS mobile apps and online services (including gamification) made within the community. Light blue arrows represent data flows: crowd-sensing raw data from smartphones to cloud, and aggregated open data from cloud to policy makers, public administrators, and stakeholders. Yellow arrows represent direct incentives and rewards. Ride sharing is directly monetized by car drivers and passengers in terms of reduced travel expenses, while additional rewards and incentives can be possibly provided by policy makers and other stakeholders in the context of awareness raising and monitoring campaigns. The dashed dark arrow represents road maintenance, while the dashed yellow arrow represents the public money saved thanks to the timely maintenance of the road network.

Finally, dashed green arrows represent indirect benefits experienced by community members and stakeholders in terms of: road safety, driving comfort, socio-economic development, and environmental quality.

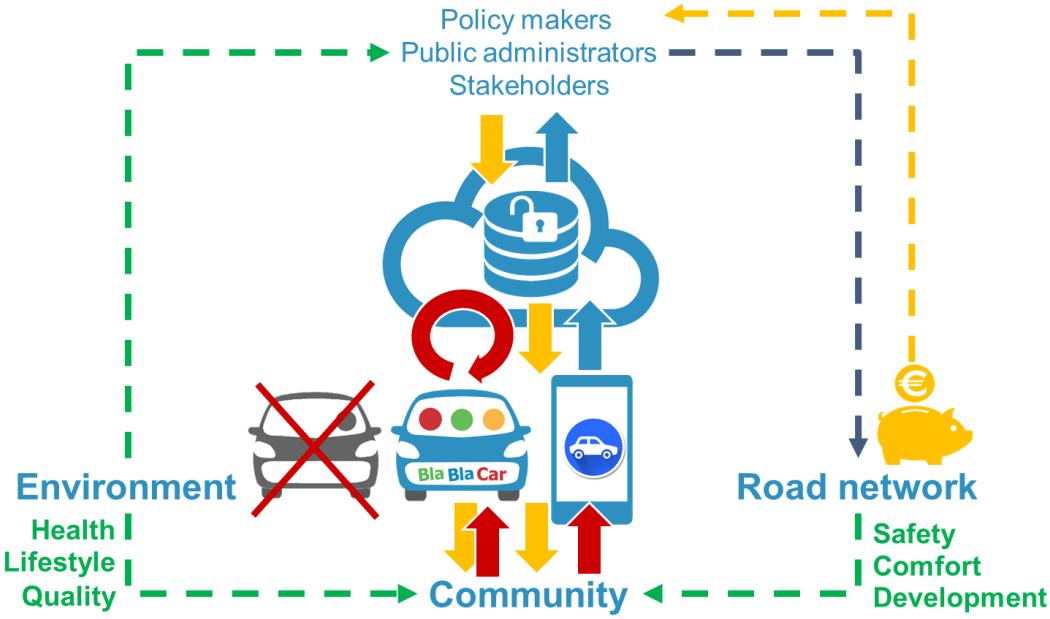

Figure 1. The CROWD4ROADS ecosystem.

The project entails the development of a platform able to unleash and combine the potential of ride sharing and crowd sensing, as detailed in Section 1.3.4.

1.3.2 TRL positioning

The CROWD4ROADS project goes from the formulation of the interaction models between grassroots ride-sharing and crowd-sensing systems (TRL2 and TRL3) to the demonstration of a full-fledged prototype in relevant and operational environment (TRL6 and TRL7), spanning all the levels in between. In particular, the key aspects to be validated in lab (TRL4) and in relevant environments (TRL5) are: the scalability of real-time data aggregation and processing algorithms, the effectiveness of gamification and incentive mechanisms, the quality of road roughness estimates, and the economic sustainability of the model.

It is worth mentioning that research and innovation will be grounded on technologies and techniques fully mastered by the partners (namely, crowd sensing, ride sharing, cloud computing, gamification, trust

management, and open data). This makes it possible to reach TRL7 with a small budget by focusing directly on the research and innovation aspects, by implementing the new features on top of working prototypes, and by using existing communities of beta testers and early adopters.

Exploitation plans will be made envisioning the application of the actual system in a full operational environment (up to TRL9).

1.3.3 Partners' national and international R&I activities

Project name and details	*Partners involved*	*Outputs to be fed into the project*
"ULOOP: User Centric Wireless Local Loop" EU FP7-ICT-257418 2010-2013 http://www.uloop.eu/	UNIURB	Cooperation incentive mechanisms and trust management in user-centric networks
"VirtualSense" Internal project 2012-2015 http://www.virtualsense.it/	UNIURB	Open-HW platform for ultra-low-power wireless sensor networks with a Java-compatible virtual runtime environment
"SmartRoadSense" Italian Technology Transfer Project sponsored by Autolinee Vitali 2013-2014 http://smartroadsense.it/	UNIURB	Cooperative road surface monitoring based on smartphone accelerometers
"MCloud: Marche Cloud" Internal project 2012-2015 http://www.ecommunity.marche.it/mcloud/	MAR	Cloud computing IaaS infrastructure (which will be expanded in terms of storage capability, network bandwidth, security features, computational performance) provided to host the pilot's software solutions.
"Marche GoOD PA"	MAR	Government Open Data with particular regard to the datasets released in the process for traffic and transport data flow optimisation and sharing (mobile information, schedules of local public transport).
"BlaBlaCar" http://bablacar.com/	COMUTO	A trusted community marketplace that connects drivers with empty seats to passengers looking for a ride. 10 million members in 18 countries.
"GaLA: Game and Learning Alliance" FP7-ICT- 258169 2010-2014	COVUNI	The GALA network aims to shape the scientific community and build a European Virtual Research Centre (VRC) aimed at gathering, integrating, harmonizing and coordinating research on Serious Games and disseminating knowledge, best practices and tools as a

		reference point at an international level.
Pergamon H2020	COVUNI	H2020 project to develop a pervasive gaming platform that EU SMEs will be able to access to develop their own specific pervasive games.
"MAGELLAN" FP7-ICT- 611526 2013-2017	COVUNI	Research and development of location-based games for the creative industry.
PROTEIN2FOOD Horizon 2020 Sustainable food security	SATEAN	Experimentation and development in sustainability-related project.
OneTransport	BUCKADV	OneM2M-based open ecosystem for transport modal shift
TWIST Demand responsive Transport WIth a Social Target, in mountain and rural areas.	ABR, MAR	Demand-responsive transport with a social target.

Table 2: Previous activities of the CROWD4ROADS consortium

1.3.4 Overall approach and methodology

Ride sharing and mobile crowd sensing of road roughness are emerging technologies which have been independently developed and demonstrated. Putting them together to harness collective intelligence gives raise to technical and behavioural challenges that will be addressed within the project.

From a technical standpoint, the key issues are related with the scalability of the real-time data aggregation process of SmartRoadSense. From a behavioural standpoint, cooperation incentives need to be provided in order to reach the critical mass needed to trigger the network effect within the pilots. On the other hand, the implementation of cooperation incentives, rewards, and gamification mechanisms adds to the computational and communication requirements of the system.

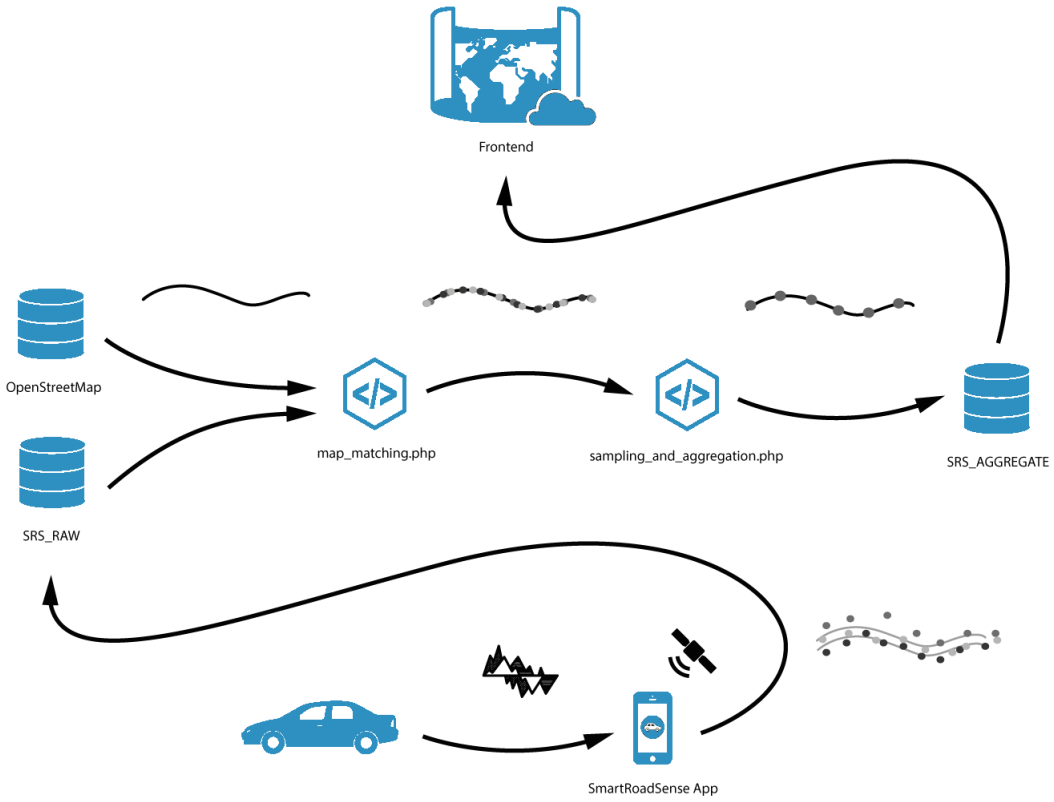

Figure 2. Crowd-sensing data processing scheme.

Figure 2 shows the key elements of the crowd-sensing system used by SmartRoadSense to monitor the quality of the road surface: a mobile application, a cloud-based backend, and a web portal. The application runs in background on any car-mounted Android smartphone, reads the accelerometer data at a frequency of 100Hz, and computes roughness values once per second. All the values are associated with GPS coordinates and opportunistically sent to the server as soon as a suitable data connection is available. Traces are processed in cloud to compensate GPS inaccuracy and to aggregate data provided by different users. OpenStreetMap [OSM15] is used for map matching and aggregation, performed every 6 hours. Aggregated roughness estimates are then made publicly available online and displayed in color-scale on interactive maps.

The architecture outlined above is not only a data gathering system, but a thorough distributed processing system in which smartphones act both as sensors and as digital signal processors, taking care of a fundamental computational step that takes in input 300 samples to compute each value of the roughness index. Traces are split into burst of 1000 seconds to be sent to the server. This is done for two main reasons: for communication efficiency, and for anonymity. In fact, trace segments are associated with unique identifiers which are not related to the smartphone from which they originated, nor to its owner.

CROWD4ROADS will make it possible for the end-user to store the unique identifiers of the traces he/she provided in order to claim the credits/rewards possibly associated with them. This will provide the key mechanism to implement gamification and incentive policies without impairing anonymity. In fact, no personal information need to be disclosed in order to obtain the reward and no personal data need to be managed by the platform. A centralized virtual currency system will be adopted to avoid double spending and cheating while preserving anonymity.

Map matching is a computational/data intensive task that is performed to compensate GPS errors and associate each sample to the most likely road segment (all the roads being ideally split into segments of 20m). All the samples associated with the same segment are then aggregated to obtain a more accurate estimate of its roughness index. CROWD4ROADS will dynamically compute data quality levels associated with each roughness index. Quality estimates will be based on the number of samples available to compute each roughness index and on their variance. Whenever a new sample is provided and mapped on a road segment, both the roughness index and the corresponding quality value need to be updated. In principle, the net contribution of each sample to the monitoring system could be computed as its incremental contribution

to the quality of the roughness estimate. This provides a statistically sound rationale behind any reward mechanism used within CROWD4ROADS.

Additional reward criteria will be based on ride sharing. BlaBlaCar users traveling together will be allowed to link the traces they provide (using the unique identifiers mentioned above) in order to earn more credits both for their additional contribution to the quality of data and for the sustainable car usage behaviour they adopted.

Server-side scalability will be addressed by porting the CROWD4ROADS system on top of MCloud, an Infrastructure as a Service cloud system based on OpenStack [OS15]. The back-end will be based on a PostGIS [OBE11] cluster (a PostgreSQL with GIS extensions) implementing load balancing algorithms and exploiting the inherent parallelism given by the temporal and geographic separation of road roughness traces contributed by different users. Computational resources will be dynamically allocated based on actual load conditions. The web-based front-end will be implemented by splitting the application into micro-services (tile generation and customization, data filtering, visualization and presentation) possibly running on different machines.

All the roughness values will be made available as open data into a GeoJSON compressed archive [GJSON]. Web services allowing end-users to extract only the data within a given bounding box will be also provided.

As for usability and replication, the CROWD4ROADS application will be developed for at least the three most popular mobile platforms, namely, Android, iOS, and Windows Phone.

A gamification layer will be implemented on top of CROWD4ROADS based on the societal value of the engagement of the players. A scoring function will be carefully developed and tested on the use cases taking into account both the incremental contribution of the end-user to the quality of road roughness indexes, and the sustainability of his/her car usage habits. In order to induce a uniform coverage and a continuous monitoring of the road network, a bonus will be awarded to any user who visits a road that has not been visited by other users for a given period of time (to be tuned as a key parameter of the gamification platform).

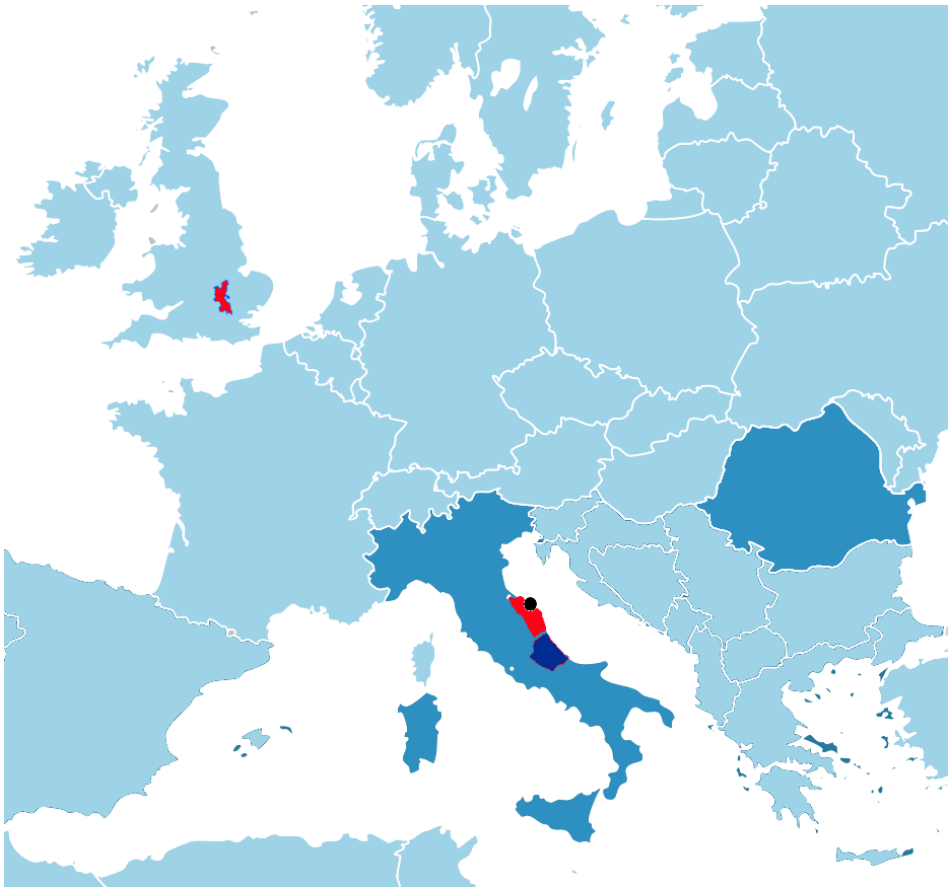

Figure 3. Pilots

Figure 3 shows on a partial map of Europe the pilots that will be implemented within the project. The black dot represents the city of Pesaro, which will be used by UNIURB both as a living lab and as a urban pilot. This is made possible by the direct involvement of the Municipality of Pesaro, which has already adopted SmartRoadSense for road maintenance planning and committed to test and exploit the results of the CORWD4ROAD project (see attached declaration of interest). The two red areas correspond to Marche region and Buckinghamshire, where region-wide pilots will be developed under direct control of MAR and BUCKADV. In particular, MAR will involve local Public Administrations and public transportation companies (organized into 5 consortia that are managing together more than 1.300 buses) in the testing and the starting up of a distributed and participated permanent monitoring system. Moreover, MAR will reuse Open Data for policymaking and planning, computing road quality key performance indicators (KPIs) for institutional purposes. BUCKADV will integrate open data coming from CROWD4ROADS into the regional One-Transport system. The orange area corresponds to Regione Abruzzo, where ABR will replicate the pilot developed by MAR. Finally, Italy and Romania are highlighted in blue to represent country-wide pilots. In Italy the pilot will be mainly based on the BlaBlaCar community, while in Romania the pilot will exploit the direct involvement of the national industry association to invite companies to engage their employees.

1.4 Ambition

Table 1.4.a reports the advancement of CROWD4ROADS with respect to related previous projects. A survey of the state of the art with highlights of the progress of the project is provided in the following subsection.

Project (project name, acronym, timeframe, funding scheme, website)	*CROWD4ROADS advance*
SMARTH20 [FP7 ICT 2014-2017] **SmartH2O: an ICT Platform to leverage on Social Computing for the efficient management of Water Consumption** **http://cordis.europa.eu/project/rcn/191632_en.html**	The SmartH2O project aims at developing an ICT platform for improving the management of urban and peri-urban water demand, integrating smart meters, social computation, and dynamic water pricing, based on advanced models of consumer behaviour. It shows how social awareness (and dynamic pricing) can modify the behaviour of resource usage. CROWD4ROADS focus will be on promoting collective awareness of sustainable mobility and road maintenance issues.
CITIZENSENSE [FP7-IDEAS-ERC 2013-2017] **Citizen Sensing and Environmental Practice: Assessing Participatory Engagements with Environments through Sensor Technologies** **http://cordis.europa.eu/project/rcn/106442_en.html**	CITIZENSENSE will investigate, through three case studies (wild, pollution, and urban sensing), the relationship between technologies and practices of environmental sensing and citizen engagement. Focus on citizen sensing not only as data crowdsourcing, but as means to provide novel environmental awareness and practice. The focus of CROWD4ROADS is the integration of trip-sharing platform and road monitoring technologies with emphasis on scalability, usability and engagement issues.
MYWAY [FP7 - ICT 2013-2016] **European Smart Mobility Resource Manager** **http://cordis.europa.eu/project/rcn/110311_en.html**	MyWay will investigate, develop and validate an integrated platform including cloud-based services and facilities to support community supplied information collection and processing with the aim of efficient and seamless integration and use of complementary, capacity-limited mobility services, including all transport modes (motorised and non-motorised, EVs, public transport, flexible services such as transport on-demand) and mobility sharing schemes (e.g. car sharing, motorbike sharing and carpooling). The platform will be tested in

	three European areas – Barcelona and Catalonia Region (ES), Berlin (DE), and Trikala (GR).MyWay focus is on giving support to users' needs and preferences within the given framework to promote sustainability of urban transport. CROWD4ROADS will develop a cloud-based architecture for scalable integration of automatic road surface monitoring and ride sharing services aiming at addressing issues related to road infrastructures maintenance and promoting sustainable mobility.
WESENSEIT [FP7- ENVIRONMENT 2012-2016] **WeSenseIT: Citizen Observatory of Water** **http://cordis.europa.eu/project/rcn/106532_en.html**	WeSenseIt will develop a citizen-based observatory of water. It will allow citizens and communities to actively take part in information gathering, evaluation and communication. Main key points: gathered data used as a proxy for collective intelligence through data mining; decision making support by means of multi-objective optimization; promote citizen participation in water management policies. CROWD4ROADS will target both sustainable mobility an participative sensing through development of a system supporting car occupancy rates reduction and timely road maintenance intervention.
MOVESMART [FP7 - ICT 2013-2016] **Renewable Mobility Services in Smart Cities** **http://cordis.europa.eu/project/rcn/110310_en.html**	MOVESMART aims at providing time-dependent route planning and personal mobility services using a set of crowd-sourcing tools for collecting real-time information by multimodal travellers. Cloud based architecture with traffic reports securely and anonymously gathered directly by the travellers via portable navigation device and/or smartphone application interfaces. A set of cloud-based mobility services will be delivered, such as Renewable Mobility on Demand, Vehicle Sharing and Integrated Personal Mobility. CROWD4ROADS main features are represented by a thorough integration of sustainable mobility services and automatic monitoring of roads qualities by means of crowd sensing architecture.
CITYMOBIL2 [FP7 - TRANSPORT 2012-2016] **Cities demonstrating cybernetic mobility** **http://cordis.europa.eu/project/rcn/105617_en.html**	Follow-up of the CITYMOBIL project. Focus on 12 cities which will revise their mobility plans and adopt wherever they will prove effective automated transport systems. Then CityMobil2 will select the best 5 cases (among the 12 cities) to organise demonstrators. Mainly targeting legal and socio-economic framework. CROWD4ROADS will exploit crowd sensing to achieve road quality monitoring. Ride sharing will be used to promote sustainability awareness and guaranteeing a capillary support to monitoring activities.
MOBINCITY [FP7 - ICT 2012-2015] **SMART MOBILITY IN SMART CITY** **http://cordis.europa.eu/project/rcn/104177_en.html**	MOBINCITY aims at the optimization of Fully Electric Vehicles (FEV)autonomy range and the increase in energy efficiency thanks to the development of an ICT-based integrated system. The system encompasses driver, vehicle and transport and energy infrastructures, taking advantage of the information provided from these sources in order to optimise both energy charging and discharging processes (trip planning and routing).Focus on FEV, with contributions regarding traffic management, energy, ICT

	and automotive industry. CROWD4ROADS will represent a platform aimed at connecting crowd sensing, smart transport and road infrastructure maintenance. Promotion of user engagement and awareness through a gamification layer is also taken into consideration by the project.
HERMES [FP7 SME 2012-2014] **Innovative, Highly Efficient Road Surface Measurement and Control System** **http://cordis.europa.eu/project/rcn/104516_en.html**	The project proposes a novel road quality measurement solution enabling measurements (through cameras and laser devices) of both the longitudinal and transversal profiles of a road to be simultaneously undertaken from a specially equipped vehicle travelling at normal road speeds.HERMES road profile measurements are integrated with geographical location. Toolset for data analysis planned to be developed so as to allow the efficient processing of the huge amounts of data collected by the HERMES vehicles. CROWD4ROADS will exploit accelerometers mounted on smartphones for automatic monitoring of road roughness. High diffusion levels of smartphones as consumer electronics devices make them an ideal target for crowd sensing applications. The project aims at capillary monitoring of road qualities through the pervasiveness of mobile devices with "smart" capabilities without the need of further investments on supplementary equipment.
COSMO[CIP 2010-2013] **Cooperative Systems for Sustainable Mobility and Energy Efficiency** **http://cordis.europa.eu/project/rcn/191745_en.html**	COSMO is a 32-month pilot project whose aim is to demonstrate the benefits of integrating advanced cooperative traffic management services. Assessment of energy efficiency, measuring the effect of a range of innovative traffic management systems on not only fuel consumption and traffic emissions, but also the energy used to operate roadside equipment. Three pilots located in Salerno (Italy), Vienna (Austria) and Gothenburg (Sweden) were implemented involving traffic management strategies integrated with 'cooperative systems' technologies developed in EC-funded research initiatives. CROWD4ROADS will target different features in that it will sustain energy efficiency through engagement of users in alternative transport modes (i.e. ride sharing) and, at the same time, it will enable crowd-based control of road surface quality.
COMPASS4D [CIP 2013-2015] **Cooperative Mobility Pilot on Safety and Sustainability Services for Deployment** **http://cordis.europa.eu/project/rcn/191947_en.html**	It involves 7 European cities in a pilot whose aim is testing implementing three cooperative services: Forward Collision Warning, Red Light Violation Warning and Energy Efficient Intersection service. Test foreseen on at least 334 vehicles and 550 users. A distinguishing feature of CROWD4ROADS will be the support to crowd sensing through ride sharing. It is therefore conceivable for the envisioned pilots to be particularly significant in terms of coverage of road networks and car occupancy rates.
CITYMOBIL [FP6- SUSTDEV 2006-2011] **Towards advanced road transport for the urban environment**	Large-scale demonstrators planned to supply proof of concept of innovative transport systems integrated in the urban environment. It demonstrated how automating road vehicles can lead to different transport concepts, from

http://cordis.europa.eu/project/rcn/79971_en.html	partly automated car sharing schemes through cyber cars, to Advanced BRT (Bus Rapid Transit) which, together with other measures (from conventional Public Transport to parking pricing and access restriction), can combine to make urban mobility more sustainable. CROWD4ROADS will exploit crowd sensing to achieve road quality monitoring. Ride sharing will be used to promote sustainability awareness and guaranteeing a capillary support to monitoring activities. Particular attention will be paid to scalability issues through the adoption of a cloud based platform and to end users engagement by means of gamification mechanisms.

Table 1.4a: CROWD4ROADS Advancement w.r.t. other projects

1.4.1 Progress beyond the state-of-the-art

Several studies demonstrate that road surface degradation impairs driving safety and comfort and leads to an increase in vehicle operating costs, fuel consumption, and CO2 emissions, and triggers a positive feedback loop ultimately increasing the occurrence of road infrastructural failures due to the added dynamic loads of the vehicles [SAE65][DAHLBERG79][NQI96]. Several studies have tried to model the road elevation profile, using sine waves, step functions, or triangular waves [WONG01], or as the sum of randomly generated sinusoidal functions with different amplitudes and phases. More recently, it was shown that the spatial Power Spectral Density (PSD) of a typical road surface has a low-pass characteristic, which decreases at the increase of the spatial frequency (measured in cycles/m) [NDOYE06]. A consolidated approach for estimating road surface condition entails the adoption of costly and sophisticated hardware equipment such as, for instance, laser profilers, specific accelerometers and data acquisition systems [NDOYE11]. A first attempt to use low-cost sensors was made by Eriksson et al. [ERIKSSON08], who built a system (named the *Pothole Patrol*) targeted at monitoring road anomalies. They used a set of accelerometers and GPS devices deployed in embedded computers in cars. The sampled signals, processed by a given set of filters to remove artefacts and noise, are given as input to machine learning algorithms for detection of potholes and road anomalies. Mohan et al. introduced "Nericell", a road and traffic monitoring system based on smartphones [MOHAN08] exploiting microphones, accelerometer and GPS for detecting potholes, bumps and traffic related events such as braking and honking. SmartRoadSense was officially presented in 2014 as the first crowd-sensing system for the automatic classification and continuous monitoring of the road surface roughness [SRS14]. The beta version of SmartRoadSense was released in Italy in February 2015.

Crowd sensing is an increasingly popular paradigm for gathering significant amounts of data from active communities of users (i.e. participatory sensing) or agents opportunistically carrying on sensing tasks (i.e. opportunistic sensing) [GANTI11]. Data is usually sensed by mobile devices whose location can be tracked with a given precision, so that useful geo-referenced information can be obtained and geographic information systems (GIS) can be exploited for data mining. The ever increasing widespread diffusion of commodity smartphones and the availability of several sensors (e.g. accelerometers, GPS, ambient light, microphones, cameras, etc.) on board of them, make these devices the ideal candidate sensing platform for many large scale mobile monitoring tasks [GANTI11], [LANE10]. Vtrack is a system that enables road traffic delay estimation using mobile phones, with emphasis on energy consumption and noise compensation [THIAGARAJAN09]. A follow-up paper from the same research group described an approach to trajectory mapping from cellular GSM fingerprints instead of WiFi and GPS traces [THIAGARAJAN11]. A prominent example of large-scale system based on mobile sensing is represented by OpenSense, a system aimed at monitoring air pollution by means of sensor stations deployed on public transport vehicles and through participative sensing from citizens equipped with ad hoc pocket sensors or enhanced smartphones [ABERER10].

Mobile crowd sensing inherently implies dealing with expected large volumes of data that prompt for efficient and scalable solutions both at system and at algorithmic level.

The growing research field of the so-called spatial Big Data mainly refers to the development of novel methodologies and approaches to address all issues related to geospatial massive datasets. Within this framework, some recent works highlighted the need for new flexible approaches and, at the same time, pointed out the inadequacy of more traditional approaches rooted in database research [SHEKHAR12], [SIMION13]. Moreover, while modern database management systems routinely face problems related to efficient storage, search, and processing of data, visualization systems need to be re-designed in order to keep pace with Big Data. According to this perspective, Keller et al. introduced Vizzly, a middleware designed for interactive browsing of large data sets in sensor networks applications which has been integrated in the OpenSense project framework [KELLER12]. Battle et al. stressed the lack of a thorough support of visualization systems to larger scales. In order to overcome some of the related challenges they proposed ScalaR, a system for dynamic resolution reduction to be applied when results of a query are expected to be too big to be handled by standard data base management systems (DBMS). Reduction is achieved through a chain of aggregation, sampling, and filtering operations [BATTLE13].

If, on one hand, crowd sensing has the potential of providing a huge amount of data at negligible cost, it has some inherent limitations that need to be carefully addressed. First of all, end-users need to be motivated to take part in monitoring campaigns in order to make sure that a sufficient amount of data is provided. Second, misbehaviours (due either to unskillfulness or to cheating) need to be recognized and isolated in order not to affect the reliability. Third, data accuracy is not guaranteed because of the lack of control on the inherent accuracy of the devices and on their operating conditions.
The fast growing interest in crowd sensing has prompted for the development of a large number of approaches to address each one of the above-mentioned issues, as documented in recent works surveying cooperation incentives [DUAN12,YANG12], trust management [FRENCH12], and crowd sensing data accuracy [SARMA14].

The CROWD4ROADS project takes as a starting point SmartRoadSense and improves the state of the art of road monitoring and sustainability in several directions:

- It creates a stable relationship between crowd-sensing and ride sharing, enhancing collective awareness on the importance of the conditions of the road network and engaging end-users in its sustainability;
- It addresses scalability issues and develops a cloud-based system potentially supporting global-scale road monitoring;
- It builds a gamification layer on top of trip sharing and road monitoring systems, thus creating a real-world game the providing open data of public interest;
- It develops new incentive mechanisms to allow policy makers, public administrators, and stakeholders to engage citizens in monitoring and sustainability campaigns;
- It combines trust mechanisms and zero knowledge techniques to preserve anonymity while supporting gamification, monetization, and social sharing.

2 Impact

2.1 Expected impacts

2.1.1 Expected impacts set out in the work programme

The project is expected to provide sizeable impacts at innovation, scientific, and societal levels.

At innovation level the project is expected to:

- Demonstrate the effectiveness of grassroots solutions to address two sustainability issues for which no top-down solutions have proven effective: increasing the car occupancy rate and monitoring the actual conditions of the entire road network. The pilots are expected to provide a sizeable impact both in terms of average car occupancy rate (improving this figure by at least 0.5) and in terms of monitoring (by becoming the main source of road quality data in at least 3 of the pilots).

- Demonstrate the innovation potential coming from the availability of participatory open data of public utility. This impact will be measured by monitoring the number of third parties re-using the open data made available by CROWD4ROADS. At least 10 local public administrations are expected to officially reuse CROWD4ROADS data.

- Effectively involve citizens in the project. This impact will be measured in terms of adoption rate, taking as a baseline the adoption rate of the two underlying initiatives: BlaBlaCar and SmartRoadSense. The project is expected to have an adoption rate within the pilots that exceeds by at least 15% the adoption rate typical of trip sharing and crowd sensing initiatives alone.

- Reach the critical mass required to establish a durable involvement of citizens. Several KPIs will be used to this purpose and applied to the pilots: the percentage of roads monitored at least once per year (which is expected to be above 90% in urban and regional pilots, and above 50% in country-wide pilots), the percentage of road segments with at least 3 independent measures per month (which is expected to be above 25% in the urban pilots, 15% in regional pilots, and 10% in at least one of the national pilots), the number of shared km travelled per year (which is expected to be more than 1 million km), the size of the CROWD4ROADS community (which is expected to be more than 1 million people).

At scientific level the project is expected to:

- Make available to the scientific community a large amount of (privacy respecting) open data on car occupancy rate, car usage habits, road conditions, and road degradation. The reuse of the data to support evidence-based studies and research activities will be incentivized together with their correlation with other existing data sets. The data provided within the project are expected to cover more than 1 million km of European roads.

- Demonstrate the effectiveness of gamification, trust-management, and social networking applied to anonymous crowd-sourcing.

At societal level, the project is expected to:

- Demonstrate the suitability of bottom-up approaches to the solution of sustainability threats, by providing estimates of the CO2 emissions saved within the pilots and of the money saved (both in terms of maintenance and in terms of vehicles operating costs) thanks to timely maintenance interventions.

- Demonstrate the scalability and replication potentials of the proposed approach. This will be done by conducting pilots at different scales (from urban to national) and by conducting a replication experiment within the project. In particular, the CROWD4ROADS platform and the incentive/gamification mechanisms developed on top of it will be made available to third parties for

reuse and adoption. Mechanisms and models will be carefully developed as part of the exploitation plan.

2.1.2 Innovation capacity and integration of new knowledge

The project will significantly improve the innovation capacity both directly and indirectly. Direct impact on innovation will be reached by making available the crowd sensing and trip sharing platform, together with all the underlying algorithms and technologies, to all the stakeholders.

Indirect impact will be achieved by making available a large amount of valuable open data and an active community motivated to keep them up to date.

Also, indirect impact can come from the availability of statistically sound data on the degradation of road conditions over time. Correlating these data with data on the type of surface, on the maintenance policy, and on the traffic conditions could trigger innovation in the road sector.

2.1.3 Environmental and social impacts

The project is expected to provide environmental and social impact by contributing to induce more sustainable car usage habits, by contributing to the reduction of car emissions, and by creating a stable cooperation between citizens, public administrators, and policy makers.

2.1.4 Framework conditions

The actual achievement of the expected impacts could be affected by framework conditions, including the positions possibly taken by policy makers and national stakeholders, mobile data traffic tariffs, and digital divide issues. However, the dependence of the impact on framework conditions is limited by several factors:

1. At local and regional levels the direct involvement of Regione Marche and Regione Abruzzo, and the commitment of the Municipality of Pesaro guarantee suitable framework conditions for at least three of the pilots.

2. At national level, country-wide pilots will be developed under a worst-case scenario in which no car-pool policy is adopted and no national players help to promote the project. The commitment of the Romanian Industry Association provides by itself better conditions.

3. Infrastructural and cultural digital divide could limit the penetration of the project, but they are not expected to affect its impact which has been estimated based on the data available on BlaBlaCar and SmartRoadSense.

4. The direct involvement of the BlaBlaCar community provides a favourable terrain for CROWD4ROADS.

2.2 Measures to maximise impact

2.2.1 Dissemination and exploitation of results

In agreement with all the partners the project will ensure the correct dissemination of CROWD4ROADS results defining an effective dissemination and exploitation strategy in order to maximize the impact and the innovation potential.
A specific WP (namely, WP5) is devoted to impact maximization. Within WP5 two tasks are completely devoted to Dissemination (Task 5.2) and Exploitation (Task 5.4). Moreover, an additional task (namely, Task 5.3) is devoted to scaling up and replication, which are considered to be key features for unleashing the potential of the project.

Dissemination activities will start soon, at M6, with the development of a first version of the dissemination plan, that will be then revised at the second year. Dissemination activities include:

- publication of project results on relevant international journals and magazines (including at least one golden open access publication per year per academic partner)
- presentation at relevant conferences, workshops, symposia, and industrial events,
- organization of a scientific event (2nd Year)

- organization of a summer school (3rd Year)
- liaisons with other projects related with CROWD4ROADS
- participation of project members into the editorial boards of relevant journals and/or into the technical program committee of relevant scientific events

A first exploitation plan will be developed starting at M12, in order to have time to start exploitation activities well before the end of the project and to revise the plan at Year 3. Exploitation activities include:

- making available open data well before the end of the project, thanks to the parallel development of a baseline platform based on SmartRoadSense and BlaBlaCar (with a high technology readiness level) and of the advanced features, such as gamification and incentive mechanisms (which start from a much lower TRL);
- encouraging the early reuse of open data;
- involving as many stakeholders as possible in the pilots at any scale;
- conducting socio-economic analysis demonstrating the impact of the project and making them available to the relevant stakeholders;
- influencing policy makers and regulatory bodies at all levels: regional, national, European;
- monitoring and getting in touch with the relevant standardization bodies;
- developing open exploitation plans for all the stakeholders, including not only public administrations and customer associations, but also car and smartphone manufacturers.

2.2.2 Communication

A communication plan will be developed and release since the very beginning of the project to provide clear and shared indications on the modalities by which any communication tool will have to be produced, peer reviewed, approved at consortium level and distributed to the targets. All promotional material and publicity will specify that the project has received funding from the EU and will display the European emblem. The Communication Plan will also define a series of communication tools including:

- **Project Identity** - providing the logo and required graphics
- **Website and portal** – work will commence early on in the process, so that the main information related to the project is communicated to a broad audience as soon as possible, thus sharing information about the objectives and the expected results, and announcing and distributing public deliverables and updates. The website will be directly linked to the CROWD4ROADS platform front-end, as soon as it will be available. The site and the portal will be made available in English, Italian, French and Romanian.
- **Social groups and pages** will be opened on LinkedIn, Facebook, and Google+
- **Specific accounts and tags** will be created on Twitter and Instagram
- **Templates for Project Presentations** – All partners in the consortium are requested to contribute to disseminate information about the project towards various target groups. This will entail participation in conferences or other scientific events. For this, partners will use standard templates that they will be able to adapt to the specific needs of the event they are taking part in.
- **Press Releases** – Communication to the media, especially in the target countries, will be an important element of the overall project communication.
- **Open data** will play a key role in the communication strategy. **Infographics** will be periodically created and published to communicate the main findings and achievements.

In addition, communication activities will include:

- participation in relevant events,
- organization of presentations, exhibitions, and training activities at relevant events and meetings
- demonstrations
- publication of open white papers, slides, and video-tutorials
- distribution of brochures and leaflets

Specific indicators will be adopted to monitor communication activities (based on access statistics, feedbacks, and surveys) and to possibly tune them to increase the effectiveness.

2.2.3 Management of research data

The rules for the confidentiality of information and the handling of IPRs will be fixed in the Grant Agreement, to be considered in conjunction with the applicable legislation and Commission Recommendations on managing intellectual property.

In general, however, the project will adopt an open approach to favour the dissemination and communication of project data and results and to maximize the impact. In particular:

- The project adheres to the Open Research Data Pilot
- Open source design styles will be adopted for the most relevant SW components, including the cloud infrastructure
- Open Data will be made available as one of the key outcome of the project
- Gold Open Access publications will be targeted by all the academic partners
- Open APIs will be developed at all stages to enable adoption, replication, and extension of the scope of the project
- Open Standards will be adopted and influenced (as detailed in WP6)

A Data Management Plan will be delivered within the first 6 months of the project to make sure that the openness of the project is compatible with the IPR policies adopted by all the partners.

3 Implementation

3.1 Work plan — Work packages, deliverables and milestones

The work plan is organized into five work packages: WP1, Project Management, WP2, Use cases, Requirements, and Performance indicators, WP3, Platform design and implementation, WP4, Pilot deployment and validation, and WP5, Communication, Dissemination and Exploitation.

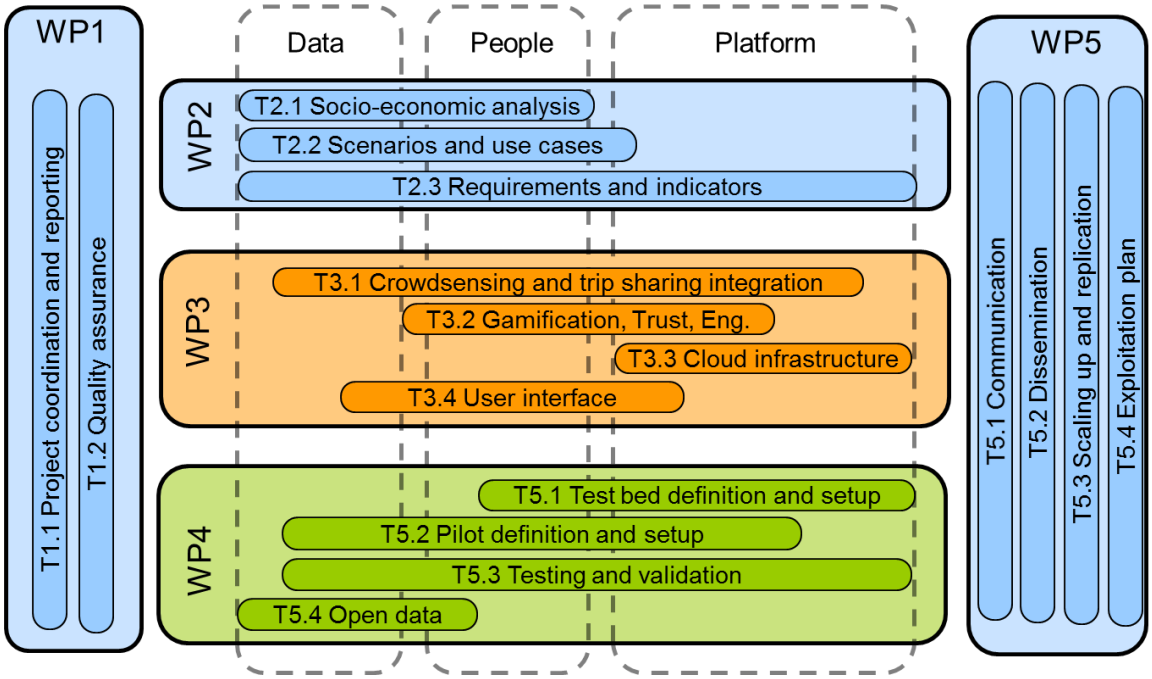

Figure 3.1.1a. Structure of the work plan

The structure of the work plan is pictorially reported in Figure 3.1.1.a, which maps all the work packages and their tasks into a two-dimensional grid representing the main phases of the project and the key elements involved. The phase in which each task will be carried out is schematically represented by its vertical position: WP2 (Use cases, Requirements and Performance Indicators) is represented at the top of the chart to denote that models, use cases, system requirements and specifications have to be derived first; WP3 (Platform design and implementation) is represented right below WP2 in that it entails the design and integration of the main components of the ecosystem, including the integration of ride sharing and crowd-sensing systems into a unique platform, the advanced features to be implemented on top of it to support gamification and cooperation incentives, the scalable cloud infrastructure, and the user interface; WP4 (Pilot deployment and validation) is represented at the bottom because it is the last phase of the project, although it will start very soon to provide early validation results to be fed back into WP3. WP1 (Project management) and WP5 (Communication, Dissemination and Exploitation) are represented at the boundaries of the chart in that they provide a framework which is orthogonal to the other tasks. The main elements of the CROWD4ROADS ecosystem are represented at the top of the figure as column labels, broadly classified into Data, People, and Platform. The horizontal position and extent of the blocks representing the tasks within each WP schematically denotes the main aspects/elements involved in that task.

Dependences among the WPs are represented by arrows in Figure 3.1.1.b using three different colors to denote management and coordination dependences, in blue, technical dependences, in red, and dissemination and exploitation of results, in orange. Information flows are not represented in the figure in that they would result is a completely connected graph. It is worth noticing that, although the technical phases of the project are conceptually concatenated from top to bottom, one of the red arrows is bidirectional. This is due to the fundamental role that testing and validation in test beds and real-world pilots will play into the project from the very beginning. In fact, all the solutions developed in WP3 will be

experimentally tested and validated step-by-step. This organization is apparent also from the Gantt, which shows sizeable overlaps among all the technical tasks.

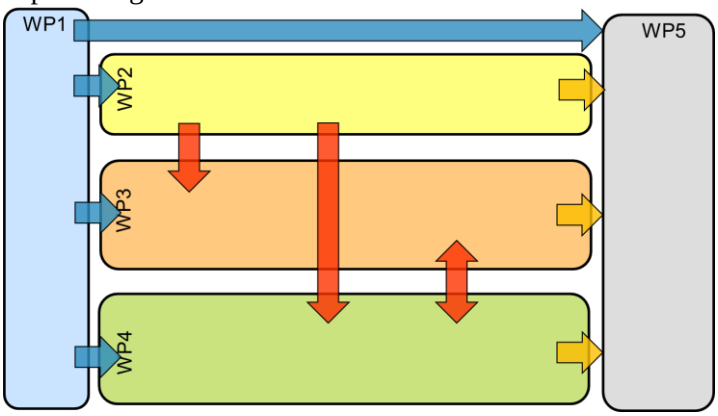

Figure 3.1.1.b. Dependences among Work Packages: management and coordination (blue arrows), technical (red arrows), dissemination and exploitation (orange arrows).

The work plan is distributed in 36 months. WP and task schedule is represented in the Gantt of Figure 3.1.1c. Yellow bars represent WPs, while light blue bars represent tasks. Deliverables and milestones are also reported in the Gantt corresponding to their expected dates, according to the detailed description provided in tables 3.1a, 3.1c and 3.2a. WP1 and WP5 cover the entire duration of the project. while WP2, WP3, and WP4 are activated in sequence taking into account their dependences. Nevertheless, they are significantly overlapped in order to speed up the design process and allow each design step to provide early feedbacks to the previous ones and to receive early feedbacks from the subsequent ones. All the dependences among tasks that could cause deviations from the schedule are treated as milestones in the project.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
WP1	**Project Management**	m1		m2																																	m12	
T1.1	Project coordination and reporting			D1.1		D1.3						D1.4a												D1.4b													D1.4	D1.5
T1.2	Quality assurance			D1.2																																		
WP2	**Use cases, Requirements and KPIs**					m3						m4																										
T2.1	Socio-economic analysis and sustainability					D2.1																																
T2.2	Definition of scenarios and use cases					D2.2																																
T2.3	System requirements and indicators											D2.3																										
WP3	**Platform design and implementation**											m5						m7						m8						m10								
T3.1	Crowd sensing and trip sharing integration					D3.1						D3.2												D3.9														
T3.2	Gamification, trust and engagement											D3.3						D3.6						D3.9						D3.10								
T3.3	Cloud configuration and scalability											D3.4						D3.7						D3.9						D3.10								
T3.4	User interfaces											D3.5						D3.8						D3.9						D3.10								
WP4	**Pilot deployment and validation**											m4						m7										m9		m10								
T4.1	Test bed definition and setup									D4.1								D4.4																				
T4.2	Pilot definition and setup											D4.3						D4.5a						D4.5b						D4.5c								
T4.3	Testing and validation									D4.1								D4.6a						D4.6b						D4.6c								
T4.4	Open data management									D4.2								D4.7												D4.8								
WP5	**Comm., Dissemination and Exploitation**			m2										m6										m8				m9				m11				m12		
T5.1	Communication		D5.1	D5.2								D5.4a												D5.4b												D5.4c		
T5.2	Dissemination					D5.3						D5.4a												D5.4b												D5.4c		
T5.3	Scaling up and replication																							D5.6						D5.8						D5.9		
T5.4	Exploitation Plan																	D5.5						D5.7a												D5.7b		

Figure 3.1.1c. GANTT of the project

Table 3.1a: Work package description

WP1:

Work package number	1	**Start Date or Starting Event**				M1-M36	
Work package title	Project Management						
Participant number	1	2	3	4	5	6	7
Short name of participant	**UNIURB**	MAR	COMUTO	COVUNI	SATEAN	BUCKADV	ABR
Person-months per participant:	7	3	1	1	3	3	4

Objectives

WP1 focuses on project management, scientific coordination, reporting and quality assurance. It is aimed at ensuring the smooth implementation of the work plan and it encompasses all the activities needed to monitor resource expenditures and to fulfil EU reporting, contractual, and ethical obligations. WP1 takes care of monitoring quality indicators and project activities, intervening through risk management procedures in the event of deviations from planned work, and providing strategic guidance to the project also in terms of liaison with relevant stakeholders or complementary initiatives. All the participants are involved in this WP, with an effort depending on their responsibilities as WP/task leaders.

Interactions with other work packages

This work package monitors the progress of work in all the WPs of the project. It is also responsible of corrective actions in cases of deviation whenever needed. Hence, it feeds all other WPs, while also receiving feedback from each of them.

Description of work (where appropriate, broken down into tasks), lead partner and role of participants

T1.1 Project coordination and reporting [M1-M36, UNIURB]

Participants: MAR, COMUTO, COVUNI, SATEAN, BUCKADV, ABR

This task entails the overall organisation, planning, monitoring and control of the activities at scientific level in order to ensure that they are carried out effectively and successfully. This task involves all the partners, which form the General Assembly. The coordinator chairs the General Assembly and the Steering Committee, composed of all WP leaders. The Steering Committee invites three external experts to form the Advisory Board. The establishment of the external Advisory Board is a milestone for the project. The activities performed in Task 1.1 are aimed at:

- Respecting the work-plan deadlines and intermediate/final results
- Preparing, executing and post-processing of scientific meetings and EC reviews;
- Ensuring the proper function of the Advisory Board in order to enable a two-way feedback and to steer appropriately the project work
- Monitoring of scientific work to assess potential risks and the undertaking of appropriate risk mitigation actions

Task 1.1 deals also with the administrative and financial aspects of project management, specifically:

- To maintain communication with the EC
- To make sure that all activities are carried out in accordance with the Grant Agreement implementation rules
- To manage resources and funds according to the project needs and work-plan
- To supervise to overall project related expenditures by setting up appropriate control mechanisms and alert systems in the event that activities or expenditures incur or present high risk of incurring in deviations from the work-plan
- To collect deliverables and submit them to the European Commission;

- To collect, synthesize and submit financial statements, certificates, etc.
- To handle legal issues and manage Intellectual property

As a complement of the project coordination and technical leadership activities, this task will also take care of day-to-day management of the project, and ensuring an open flow of information within the project.
A data management plan will be delivered in this task within the first 6 months in order for the project to take part in the Open Research Data Pilot in Horizon 2020.

T1.2 Quality assurance [M1-M36, ABR]

Participants: UNIURB, MAR, SATEAN, BUCKADV

This task concerns the definition of the quality control procedures that are required to guarantee the proper realisation of the work plan and the quality of the delivered work. These will be included in a Quality Plan to be developed in order to ensure that there are adequate processes, guidelines, and indicators for maintaining the alignment of the activities during the lifetime of the project. A comprehensive risk management plan will also be included in the Quality Plan and will be applied in cases where corrective action is required. Finally, this task involves the identification of concrete progress indicators and the evaluation of project work with respect to them. The results of this evaluation will be handled by the Steering Committee and reported as part of the periodic activity reports.

Deliverables (brief description and month of delivery)

D1.1 - Establishment of the Advisory Board [UNIURB, R, CO, M3]

Appointment of at least 3 external Advisory Board Members representing stakeholders, end-user associations, and/or regulation authorities.

D1.2 - Project Quality Plan [ABR, R, CO, M3]

Document defining quality and progress indicators, internal procedures, and quality control mechanisms.

D1.3 - Data management plan [UNIURB, R, CO, M6]

Data management plan as required to take part in the Open Research Data Pilot in Horizon 2020.

D1.4 – Periodic Project Reports: Annual project technical and financial report [UNIURB, R, CO, M12, M24, M36]

Each report provides a summary of all the activities carried out in the year it refers to, it reports quality/progress indicators and the actions possibly undertaken to deal with deviations from the project work plan. The financial part provides a description and justification of the costs incurred and of the resources deployed by each beneficiary during the reporting period, according to the regulations and guidelines of H2020.

D1.5 – Distribution of financial contribution report [UNIURB, R, CO, M37]

30 days after receipt of the final payment a report will be provided on the distribution of the European Union financial contribution between beneficiaries.

WP2:

Work package number	2	**Start Date or Starting Event**				M1-M12
Work package title	Project Management					
Participant number	1	2	3	4	5	6	7
Short name of participant	UNIURB	MAR	COMUTO	COVUNI	SATEAN	**BUCKADV**	ABR
Person-months per participant:	9	3	6	5	7	7	3

Objectives:

The goal of this work-package is primarily focused on analysing the socio-economic framework and the sustainability threats of passenger road transportation that can be addressed by means of crowd-sensing and ride sharing. Based on the analysis, representative scenarios and use cases will be defined to drive the definition of deployment of pilots and test beds. System requirements, design metrics and indicators will be also defined in order to drive the design and implementation of the platform, (WP3) and its deployment and validation (WP4).

Interactions with other work packages

WP2 is managed, as any other WP, by WP1, and provides inputs to all other WPs. In particular, system requirements will be fed into WP3, scenarios, use cases, and metrics will be fed into WP4, and all the results will be considered as inputs for communication and dissemination (WP5).

Description of work (where appropriate, broken down into tasks), lead partner and role of participants

The work package is organized into 3 tasks, devoted to: the analysis of socio-economic aspects and road sustainability threats, the definition of representative scenarios and use case, and the derivation of technical specifications, requirements, design metrics, and indicators.

T2.1 Socio-economic analysis and sustainability threats [M1-M6, BUCKADV]

Participants: UNIURB, MAR, SATEAN

The purpose of this task is the analysis of the socio-economic impact of the sustainability threats of road passenger transport and of the potential impacts of grassroots ride sharing and crowd sensing initiatives. In particular, the direct and indirect effects of car occupancy rate and road maintenance will be carefully analysed, together with the community-scale dynamics that can be exploited to motivate end-users to act as prosumers and engage in road sustainability. The critical mass and the adoption rate required to trigger positive externalities and network effects will be also estimated, together with the effectiveness of the cooperation incentives that might contribute to reach it.

T2.2 Definition of scenarios and use cases [M1-M6, COVUNI]

Participants: UNIURB, MAR. COMUTO, SATEAN, BUCKADV, ABR

This task focuses on the definition of a minimum number of scenarios and use cases representative of all the relevant contexts in which CROWD4ROADS will be used. Scenarios and use cases will then be used throughout to draw requirements and specifications. Also, scenarios and use cases will be used to inspire the definition of the test beds and pilots to be used for validation, demonstration and assessment purposes. Scenarios will be classified based on their scope, on the socio-economic development, on the types and number of stakeholders involved, and on their degree of commitment. Use cases will be distinguished based on the motivations of individuals and on their degree of adoption of both ride sharing and crowd sensing.

T2.3. System requirements and indicators [M1-M12, UNIURB]

Participants: MAR, COMUTO, SATEAN

The purpose of this task is to identify and specify the functional and non-functional requirements of the CROWD4ROADS platform according to the different scenarios and use-cases, and to define the specifications of the platform. Functional requirements and specifications will be treated at three different levels characterized by different degrees of complexity, integration, and technology readiness. The first level deals with the intersection and spontaneous interaction between existing ride sharing and crowd-sensing initiatives, namely, BlaBlaCar and SmartRoadSense. The second level deals with the integration of the two initiatives into a unique platform. The third level introduces the advanced features required to support gamification, cooperation incentives, and targeted monitoring/awareness campaigns.

Design metrics and will be carefully identified to drive the design and to support testing and validation: usability, connectedness, openness, accuracy, anonymity. System requirements will be specified to drive development and pilot deployment: performance and storage scalability, connection requirements, market penetration of Internet-enabled smartphones, … Finally, performance indicators will be identified and defined, together with their measurement protocols: road coverage, car occupancy rate, adoption rate, critical mass, community size, …

Deliverables (brief description and month of delivery)

D2.1 Socio-economic analysis and sustainability threats [BUCKADV, R, PU, M6]

Analysis of socio-economic and environmental impact of road passenger transport, together with its direct and indirect sustainability threats.

D2.2 Representative Scenario and Use Cases [COVUNI, R, PU, M6]

A report defining representative scenarios of CROWD4ROADS, together with its functional and technical use cases.

D2.3 System requirements and performance indicators [UUNIURB, R, PU, M12]

Specifications and requirements of the CROWD4ROADS platform at all stages of its development, from a simple interaction between independent grassroots initiatives, up to a full-fledged integrated platform with advanced support for gamification and monetization. Operative definitions of the key performance indicators to be used for validation, assessment, and evaluation.

WP3:

Work package number	3	**Start Date or Starting Event**				M4-M30	
Work package title	Platform design and implementation						
Participant number	1	2	3	4	5	6	7
Short name of participant	**UNIURB**	MAR	COMUTO	COVUNI	SATEAN	BUCKADV	ABR
Person-months per participant:	27	11	14	14	13	0	0

Objectives

This WP will take care of designing and implementing all the elements of the CROWD4ROADS platform starting from BlaBlaCar and SmartRoadSense, which represent the state-of-the-art in ride sharing and mobile crowd sensing.

In particular, the main objectives of this WP are:

- The integration of ride sharing and crowd sensing into a single platform,
- The design and implementation of a gamification layer, providing suitable incentives to engage a large number of end-users
- The setup of a scalable cloud-based prototype
- The design of usable interfaces both for the mobile app and for the web front-end

APIs need to be developed and released to allow third parties to possible use the platform to launch targeted monitoring campaigns, providing suitable incentives to the target end-users.

Interactions with other work packages

WP3 is managed, as any other WPs, by WP1, and provides inputs to WP5, for the communication, dissemination, and exploitation of results. Technically speaking, it is fed by WP2 and it feeds WP4. The significant overlap of the activities of WP3 with those in WP4 provides the opportunity of receiving from WP4 timely feedbacks, which are essential for convergence and integration. In particular, WP3 takes advantage of testing and validation performed on test beds and pilots.

Description of work

The work package is organized into four tasks devoted to: integration between ride sharing and crowd sensing, design and implementation of advanced features supporting gamification and incentives, cloud configuration and setup, and usability.

T3.1 – Crowd sensing and ride sharing integration [M4-M24, UNIURB]
Participants : COMUTO, COVUNI, SATEAN

This task is devoted to the development and integration of the CROWD4ROADS platform. In spite of its integration objective, it starts before any other development task because of the special nature of the project. In fact, the project takes as a starting point two existing initiatives (namely, BlaBlaCar and SmartRoadSense) that need to be integrated into a single platform before developing the advanced features that are the focus of the other tasks. Hence, integration will be performed incrementally throughout the project, introducing, testing, and validating into real-world pilots all the features as soon as they are available. This incremental approach is apparent from the list of deliverables.

T3.2 - Gamification, trust, and engagement [M7-M30, COVUNI]
Participants: UNIURB, COMUTO, SATEAN

This task is devoted to the creation of a gamification layer on top of the CROWD4ROADS platform, and to the development of trust, reputation, and incentive mechanisms which are essential to the building and management of a community. A scoring function will be defined in this task to reward end-users for their pro-social behaviours. In particular, a positive score will be assigned to end-users who provide road

roughness measurements which increase the statistical significance of the data available for a given road segment, and to end-users who share their trips. Moreover, a special bonus will be recognized to end-users who provide roughness estimates for road segments that have not been monitored for a long time.

Such mechanisms will be used both within the game, in order to increase end-users' engagement, and in the context of monitoring / awareness raising campaigns, to reach the critical mass and guarantee a more uniform coverage of a target region.

T3.3 – Cloud configuration and scalability [M7-M30, MAR]

Participants: UNIURB, COMUTO

This task deals with scalability issues. The CROWD4ROADS ecosystem relies on a scalable cloud infrastructure derived from the MCloud project of MAR, which offers an IaaS cloud system based on OpenStack. Geospatial data are managed by PostGIS, while map matching is performed on OpenStreetMap.

The main scalability issues are raised by crowd sensing, which entails collecting, processing, and making publicly available an ever increasing amount of data. These issues are addressed in part directly on the smartphones, which perform a first-step data processing and compression as detailed in Task 3.4. At server side, storage and processing requirements depend on the size of the target area (the limit being the global OpenStreetMap database, to be reached by the end of the project), on the cumulative amount of estimates provided by end-users, and on the number of simultaneous users (which is directly proportional to the computational requirements of the back-end).

Server-side scalability will be addressed by implementing load-balancing algorithms and exploiting the inherent parallelism given by the temporal and geographic separation of road roughness traces contributed by different users. Computational resources will be dynamically allocated based on the number of simultaneous users. The server farm of MCloud will be improved during the project to provide a suitable support.

Moreover, the implementation of the scoring function will be carefully studied in order to exploit parallelism and to impose a minimum overhead to the main data flow.

T3.4 – User interfaces [M7-M30, UNIURB]
Participants: MAR, COMUTO, COVUNI

The user interface is composed of three main parts. The mobile application, the usability of which is a key requirement, the web-based frontend, which will be mainly used for geospatial data visualization, and the web-based console dashboard, to be provided to third party stakeholders to launch and control targeted monitoring/sensitization campaigns.

The mobile app will be first developed for Android devices and then ported at least on iOS and Windows Phone. As mentioned in T3.3, the mobile app is an important component not only for its usability. Rather, it is a key processing element, which has the task of sampling the accelerometers 100 times per second and implementing the digital signal processing algorithm that computes the roughness index of SmartRoadSense. In addition, it has to provide support to ride sharing and take advantage of the gamification layer.

Moreover, the mobile app will guarantee anonymity. This will be done by means of zero knowledge techniques relying on public key cryptography mainly handled by mobile phones.

The web-based front-end will be implemented by splitting the application into micro-services (tile generation and customization, data filtering, visualization and presentation) running on different machines for scalability reasons. Open APIs will be also provided to make it easier to third parties to extract, access, re-use open data.

Finally, the dashboard will provide a web-based interface to allow third parties to launch targeted campaigns by exploiting all the gamification and incentive support provided by the CROWD4ROADS platform to motivate end-users to take part in the campaign in the target region.+

Deliverables (brief description and month of delivery)

D3.1 Trip sharing and crowd-sensing integration plan [UNIURB, R, PU, M6]
Report describing the incremental integration process to be adopted during the project to make available as soon as possible to the pilots the prototypes of the CROWD4ROADS platform.

D3.2 Prototype of CROWD4ROADS main features [UNIURB, OTHER, PU, M12]
First prototype of the platform providing the main crowd sensing and ride sharing functionalities.

D3.3 Gamification and reward strategies and features [COVUNI, R, PU, M12]
Report providing the details of the gamification strategy and defining the scoring function to be implemented in CROWD4ROADS.

D3.4 Big data storage and cloud infrastructure design [MAR, R, CO, M12]
Report encompassing all the technical details of the cloud infrastructure to be set up to meet the storage and computational requirement of CROWD4ROADS and to guarantee its scalability.

D3.5 Mockups of the CROWD4ROADS mobile app [UNIURB, OTHER, PU, M12]
Mockup used to define the user interface of the CROWD4ROADS mobile app and to test its usability.

D3.6 Prototype of gamification and reward mechanisms [COVUNI, OTHER, CO, M18]
Working prototype of the gamification and reward mechanisms, ready to be tested in test beds.

D3.7 Cloud infrastructure setup [MAR, OTHER, CO, M18]
IaaS cloud system hosting the prototype of CROWD4ROADS.

D3.8 CROWD4ROADS app testing version [UNIURB, OTHER, PU, M18]
Testing version of the mobile app.

D3.9 CROWD4ROADS platform alpha [UNIURB, OTHER, PU, M24]
Alpha release of the full-fledged CROWD4ROADS platform, with gamification and incentive support.

D3.10 CROWD4ROADS platform beta [UNIURB, OTHER, PU, M30]
Beta release of the full-fledged CROWD4ROADS platform, with gamification and incentive support, obtained as a refinement of the alpha release, based on the feedback received from WP4.

WP4:

Work package number	4	**Start Date or Starting Event**				M6-M30	
Work package title	Pilot deployment and validation						
Participant number	1	2	3	4	5	6	7
Short name of participant	UNIURB	**MAR**	COMUTO	COVUNI	SATEAN	BUCKADV	ABR
Person-months per participant:	14	19	11	4	19	8	9

Objectives

WP4 involves all the partners in the deployment of test beds and representative real-world pilots of different scales, to be used to test and validate CROWD4ROADS.

Preliminary tests of all system components will be performed in lab before pilot deployment. However, the incremental design approach adopted in WP3 will enable the early deployment of real-world pilots.

Both the size of the pilots and the features of the CROWD4ROADS platform deployed on top of them will increase throughout the project. All the pilots will make available their results as open data.

It is worth mentioning that the size of the pilots and the size of the reference community make it possible for CROWD4ROADS to reach within the project the critical mass required to achieve a sizeable impact in terms of KPIs.

In summary, the work package has four main objectives:

- supporting testing and validation of single design steps
- deploying representative real-world pilots
- making available open data
- creating the conditions to produce a measurable impact and to demonstrate the exploitability of the project results

According to the specific challenge and to the scope of the call, this is one of the most important WPs of the project.

Interactions with other work packages

WP4 is managed, as any other WP, by WP1, and provides inputs to WP5. Technically speaking, it is fed by WP2 and WP3 and provides timely feedbacks to WP3 to speed-up convergence and integration of the CROWD4ROADS platform.

Description of work (where appropriate, broken down into tasks), lead partner and role of participants

WP4 is split into 4 tasks focused on: test beds (T4.1), pilots (T4.2), testing and validation of design steps against system specifications and requirements (T4.3), and open data (T4.4).

T4.1: Test bed definition and setup [M7-M18, BUCKADV]

Participants: UNIURB, MAR, COMUTO, COVUNI

This task is devoted to the definition and setup of all the test beds and protocols to be used to test the key components and the methodologies developed in the project before their integration and deployment.

Testing needs include: functional test of the main features as detailed in the specifications, usability evaluations, stress tests of the cloud infrastructure conducted by means of traffic injection and synthetic benchmarks, compatibility tests made on the different mobile platforms, anonymity checks and formal proofs, interoperability tests.

The main partners involved in platform design and implementation are also involved in this task, which is led by BUCKADV, not directly involved in development, to guarantee an independent and open minded testing process.

T4.2: Pilot definition and setup [M7-M33, MAR]

Participants: UNIURB, COMUTO, COVUNI, SATEAN, ABR

This task is devoted to the definition and deployment of real-world pilots representative not only of the different scenarios and use-cases outlined in WP2, but also of the different scales at which the results of the project could be exploited, ranging from urban scale to national scale.

It is also worth mentioning that both the specific challenge of the call and the nature of the project make this task particularly crucial for the success of CROWD4ROADS. The great importance of the task is testified by the participation of all the partners, by its extension from M7 to M33, and by its overall effort, which is greater than that devoted to any other task.

The task is led by MAR, which plays the two-fold role of cloud provider and public stakeholder in charge of the deployment of a region-wide pilot.

The following pilots will be defined and deployed:

- UNIURB will take care of a urban-size pilot in Pesaro (IT), thanks to the external participation of the Municipality of Pesaro, which has already adopted SmartRoadSense for monitoring the status of its roads;
- MAR will deploy a region-wide pilot in Regione Marche (IT), not only promoting the participation in the pilot of all the municipalities and their citizens, but also engaging public transportation companies in permanent road monitoring;
- ABR will conduct a similar pilot in Regione Abruzzo (IT), replicating the experience of Regione Marche and involving many regional stakeholders, as testified by the expressions of interest attached to the proposal;
- BUCKADV will deploy a pilot in Buckinghamshire (UK) focusing on the inter-operation with the local One-transport platform;
- SATEAN will conduct a countrywide pilot in Romania (RO), taking advantage of the external participation of the national industry association. In particular, companies in Romania will be invited to engage their employees into CROWD4ROADS;
- COMUTO will engage the BlaBlaCar community into a countrywide pilot in Italy (IT).

T4.3: Testing and validation [M7-M33, SATEAN]

Participants: UNIURB, MAR, COVUNI, ABR

This is the task in charge of exploiting test beds and pilots for conducting accurate tests and validation experiments and to report to WP3. Periodic reports will be used to this purpose, together with timely day-by-day interactions with the development team.

The incremental approach adopted in the project will make it possible to start testing and validation activities in the second half of the first year, thus providing early feedbacks to drive the development and collecting statistically sound real-world data throughout the project.

T4.4: Open data management: [M7-M33, UNIURB]

Participants: MAR, SATEAN, BUCKADV, ABR

CROWD4ROADS is about people and data. Open data on road conditions and car usage habits are a primary outcome of the project. That is the reason for having a task entirely devoted to open data management.

All the anonymous geo-spatial data collected in each pilot will be processed and aggregated to produce real-time open data. All the roughness values will be made available as open data into a GeoJSON compressed archive [GJSON]. Web services allowing end-users to extract only the data within a given bounding box will

be also provided. The open data management strategy will be revised several times during the project to adapt to the upgrades of the platform. However, both the design and the open data management strategies will be carefully studied in order to guarantee the consistency of the outcomes of all the pilots, in order to support data mining and reuse. MAR will also make use of its GoOD PA Platform to make available the open data of CROWD4ROADS.

Deliverables (brief description and month of delivery)

D4.1 – **Test bed definition and testing and validation strategy (BUCKADV, R, CO, M9)**

A report pointing out the testing and validation needs and outlining the test beds and the testing protocols to be used to address them.

D4.2 – Open Data management and publication plan (UNIURB, R, CO, M9)

A report describing the criteria and the strategy to be adopted throughout the project to manage and public anonymous open data on road conditions and care usage

D4.3 – Pilots definition and community building strategy (MAR, R, CO, M12)

A report providing an accurate description of all the pilots and outlining, for each of them, the strategies to be adopted to engage a number of users sufficient to reach the critical mass.

D4.4 – Test beds (BUCKAD, OTHER, CO, M18)

Actual test beds to be used for testing purposes.

D4.5 – Periodic report and demonstration of real-world pilots at local, regional, and national scale (MAR, R-DEM, PU, M18, M24, M30)

Periodic reports and demonstrations on the activities of the pilots

D4.6 - Periodic testing and validation report (SATEAN, R, CO, M18, M24, M30)

Periodic report used to keep the consortium updated about the testing and validation experiments conducted on prototypes, test beds, and real-world pilots at the different stages of the project

D4.7 – Preliminary release of CROWD4ROADS open data (UNIURB, OTHER, PU, M18)

Release of open data on road conditions and car usage obtained from the early pilots

D4.7 – Release of CROWD4ROADS open data (UNIURB, OTHER, PU, M30)

Release of open data on road conditions and car usage obtained from the pilots, with APIs for automatic extraction and re-use of open data.

WP5:

Work package number	5	**Start Date or Starting Event**				M01-M36
Work package title	Pilot deployment and validation					
Participant number	1	2	3	4	5	6	7
Short name of participant	UNIURB	MAR	COMUTO	COVUNI	**SATEAN**	BUCKADV	ABR
Person-months per participant:	8	4	9	6	19	2	4

Objectives

The aim of this Work Package is related to the communication and dissemination of the results of the project into educational, scientific, and industrial environments; to the contribution to the relevant standardization and regulation activities at regional, national, and European levels; and to the exploitation of the results of the project in order to maximize its impact in terms of research and innovation leadership, business development, solutions to societal challenges, and collective welfare. Due to the specific nature of the project, exploitability of project results will be experimented during the project, both within the consortium (thanks to the great interest of the partners in the exploitation of early results) and outside the consortium (thanks to the expressions of interest collected form many external entities).

Scaling up and replication will be also considered in this WP as key factors to guarantee exploitation and maximize impact.

Interactions with other work packages

WP5 is managed by WP1 and receives inputs from all other WPs in order to communicate, disseminate and exploit project results. The overlapping of the activities of WP5 with those of all other WPs enables this WP to indirectly influence the project in order to maximize the impact and the exploitability of project results.

Description of work (where appropriate, broken down into tasks), lead partner and role of participants

The WP is organized into 4 tasks, focusing on communication, dissemination, scaling up, and exploitation.

T5.1. Communication [M01-M36, COMUTO]

Participants: UNIURB, MAR, COVUNI, SATEAN, BUCKADV, ABR

Communication activities will be carried out for the entire duration of the project, with the active participation of all the partners, starting with: the development and publication of the project web site, the design of the project logo, and the preparation of communication materials to be used from the very beginning to raise awareness on the topics of the project and to create the links to the relevant groups of stakeholders (end-users, public administrators, policy makers, service companies, …). The project web site will be based on a CMS granting editing rights to all the partners involved in each section to make it easy to keep the portal up to date.

Apart from the website, communication activities entail:

- positioning on social media (LinkedIn, Twitter, Facebook, …) and creation of interest groups
- presentations, exhibitions, and training activities at relevant events and meetings
- demonstrations
- publication of open white papers, slides, and video-tutorials
- participation in national end international events
- press notes and newsletters
- distribution of brochures and leaflets.

Specific indicators will be adopted to monitor communication activities (based on access statistics,

feedbacks, and surveys) and to possibly tune them to increase the effectiveness.

Open Data will be tightly linked to the communication strategy.

All the communication activities will be listed in yearly reports.

T5.2. Dissemination [M04-M36, COVUNI]

Participants: UNIURB, MAR, COMUTO, SATEAN, BUCKADV, ABR

This task aims to coordinate the dissemination activities of the entire project, mainly focused on the publication of project results on relevant international journals and magazines, on the presentation at relevant conferences, workshops, symposia, and industrial events, and on the organization of specific scientific events.

The strong experience of the two academic partners in the organization of scientific events and their involvement in the steering committee of many events related to the topics of the project (wireless sensor networks, gamification, trust management, crowd-sensing, sustainability) will be exploited to organize a scientific event and to organize dedicated sessions and tutorials at relevant international events.

In addition, an Industrial event and a Summer school will be organized and considered as milestones for the project.

Liaisons with other projects related with CROWD4ROADS will be established to increase the effectiveness of dissemination activities.

T6.3 Scaling up and replication [M19-M36, ABR]

Participants: UNIURB, MAR, COMUTO, SATEAN

This task deals with scaling up and replication, which are essential features for the success and exploitability of CROWD4ROADS. Both of them will be not only planned, but also tested during the project, In fact, the different scales of the pilots and the replication of the regional pilots from MAR to ABR will provide significant feedbacks and point out possible scalability/replication issues, making it possible to address them within the project.

Scalability will be mainly affected by the scalability of the cloud infrastructure and by the effectiveness of gamification techniques and cooperation incentives developed in WP3. Replication will be mainly affected by the availability of a suitable dashboard to allow third parties to make use of the platform to address country-specific or community-specific needs.

T6.4: Exploitation Plan [M13-M36, SATEAN]

Participants: UNIURB, MAR, COMUTO, BUCKADV, ABR

This task aims to prepare an exploitation plan considering the needs, expectations, and possibilities of each partner and of the possible stakeholders. The capability of providing fresh open data on road conditions and on car usage habits grants to CROWD4ROADS great and diverse exploitation opportunities that can be taken both by the partners and be external stakeholders.

The exploitation plan will include:

- the exploitation of the open data, the reuse of which will be facilitated by the open APIs
- the replication and possible customization of the entire platform
- the possibility for a service company to develop advanced services on top of the platform

The exploitation plan will contain descriptions of how each individual partner envisages the exploitation of project results. This plan will be subsequently refined twice into updated versions containing also recommendations and guidelines. Thanks to the early publication of open data and to the deployment of large-scale pilots, the last two releases of the exploitation plan will also report on the preliminary exploitation of the early results.

Deliverables (brief description and month of delivery)

D5.1 – Website and coordinated image (UNIURB, DEC, PU, M2)
Web site up and running, project logo and coordinate image

D5.2 – Communication plan (COMUTO, R, CO, M3)
A report specifying the communication actions to be undertaken during the project, the indicators to be used to monitor the effectiveness of communication activities, and the responsibilities assigned to partners.

D5.3 – Dissemination plan (COVUNI, R, CO, M6)
A report specifying the dissemination activities to be undertaken during the project, the indicators to be used to monitor the effectiveness, and the responsibilities assigned to partners.

D5.4 – Periodic communication and dissemination report (COVUNI, R, CO, M12, M24, M36)
A report on the communication and dissemination activities conducted during each year of the project, with detailed description of the achievements of the project in informing and engaging individuals, groups, and organisations from academic, industrial, and public administration fields.

D5.5 - Exploitation plan (SATEAN, R, CO, M18)
Preliminary description of the plan devised by the consortium for the exploitation of the project ensuring that the strategies proposed will result in reasonable benefits, within a reasonable timeframe.

D5.6 – Scaling up and replication plan (ABR, R, CO, M24)

A report providing preliminary guidelines for replication and scaling up, with a specific focus on the replication in Regione Abruzzo of the pilot conducted in Regione Marche.

D5.7 – Periodic exploitation plan (SATEAN, R, PU, M24, M36)
Refined versions of the exploitation plan and guidelines, together with a report on early exploitation activities conducted inside and outside the consortium.

D5.8 – Report on the internal replication experiment (ABR, R, PU, M24)

A report on the replication experiment conducted between Regione Marche and Regione Abruzzo.

D5.9 – Final scaling up and replication plan (ABR, R, PU, M36)
Accurate guidelines and strategies for scaling up and replication.

Table 3.1b: List of work packages

Work package No	Work Package Title	Lead Participant No	Lead Participant Short Name	Person-Months	Start Month	End Month
1	Project Management	1	UNIURB	22	M1	M36
2	Use cases, Requirements, and KPIs	6	BUCKADV	40	M1	M12
3	Platform design and implementation	1	UNIURB	79	M4	M30
4	Pilot deployment and validation	2	MAR	84	M6	M30
5	Communication, Dissemination and Exploitation	5	SATEAN	64	M1	M36
				289		

Table 3.1c: List of Deliverables

Deliverable (number)	Deliverable name	Work package number	Short name of lead participant	Type	Dissemination level	Delivery date
D1.1	**Establishment of the Advisory Board**	WP1	UNIURB	R	CO	M3
D1.2	**Project Quality Plan**	WP1	ABR	R	CO	M3
D1.3	**Data management plan**	WP1	UNIURB	R	CO	M6
D1.4	**Periodic Project Reports: Annual project technical and financial report**	WP1	UNIURB	R	CO	M12, M24, M36
D1.5	**Distribution of financial contribution report**	WP1	UNIURB	R	CO	M37
D2.1	**Socio-economic analysis and sustainability threats**	WP2	BUCKADV	R	PU	M6
D2.2	**Representative scenarios and use cases**	WP2	COVUNI	R	PU	M6
D2.3	**System requirements and performance indicators**	WP2	UNIURB	R	PU	M12
D3.1	**Trip-sharing and crowd-sensing**	WP3	UNIURB	R	PU	M6

	integration plan					
D3.2	**Prototype of CROWD4ROADS main features**	WP3	UNIURB	OTHER	PU	M12
D3.3	**Gamification and reward strategies and features**	WP3	COVUNI	R	PU	M12
D3.4	**Big data storage and cloud infrastructure design**	WP3	MAR	R	CO	M12
D3.5	**Mockups of the CROWD4ROADS mobile app**	WP3	UNIURB	OTHER	PU	M12
D3.6	**Prototype of gamification and reward mechanisms**	WP3	COVUNI	OTHER	CO	M18
D3.7	**Cloud infrastructure setup**	WP3	MAR	OTHER	CO	M18
D3.8	**CROWD4ROADS app testing version**	WP3	UNIURB	OTHER	PU	M18
D3.9	**CROWD4ROADS platform alpha**	WP3	UNIURB	OTHER	PU	M24
D3.10	**CROWD4ROADS platform beta**	WP3	UNIURB	OTHER	PU	M30
D4.1	**Test bed definition and testing and validation strategy**	WP4	BUCKADV	R	CO	M9
D4.2	**Open data management and publication plan**	WP4	UNIURB	R	CO	M9
D4.3	**Pilots definition and community building strategy**	WP4	MAR	R	CO	M12
D4.4	**Test beds**	WP4	BUCKADV	OTHER	CO	M18
D4.5	**Periodic report and demonstration of real-world pilots at local, regional, and national scale**	WP4	MAR	R DEM	PU	M18, M24, M30
D4.6	**Periodic testing and validation report**	WP4	SATEAN	R	CO	M18, M24, M30
D4.7	**Preliminary release of CROWD4ROADS open data**	WP4	UNIURB	OTHER	PU	M18
D4.8	**Release of CROWD4ROADS open data and API**	WP4	UNIURB	OTHER	PU	M30
D5.1	**Website and coordinated image**	WP5	UNIURB	DEC	PU	M2

D5.2	**Communication plan**	WP5	COMUTO	R	CO	M3
D5.3	**Dissemination plan**	WP5	COVUNI	R	CO	M6
D5.4	**Periodic communication and dissemination report**	WP5	COVUNI	R	CO	M12, M24, M36
D5.5	**Exploitation plan**	WP5	SATEAN	R	CO	M18
D5.6	**Scaling up and replication plan**	WP5	ABR	R	CO	M24
D5.7	**Periodic exploitation report and strategy refinement**	WP5	SATEAN	R	PU	M24, M36
D5.8	**Report on the internal replication experiment**	WP5	ABR	R	PU	M24
D5.9	**Final scaling up and replication plan**	WP5	ABR	R	PU	M36

KEY

Deliverable numbers in order of delivery dates. Please use the numbering convention <WP number>.<number of deliverable within that WP>.

For example, deliverable 4.2 would be the second deliverable from work package 4.

Type:

Use one of the following codes:

R: Document, report (excluding the periodic and final reports)
DEM: Demonstrator, pilot, prototype, plan designs
DEC: Websites, patents filing, press & media actions, videos, etc.
OTHER: Software, technical diagram, etc.

Dissemination level:

Use one of the following codes:

PU = Public, fully open, e.g. web
CO = Confidential, restricted under conditions set out in Model Grant Agreement
CI = Classified, information as referred to in Commission Decision 2001/844/EC.

Delivery date

Measured in months from the project start date (month 1)

3.2 Management structure and procedures

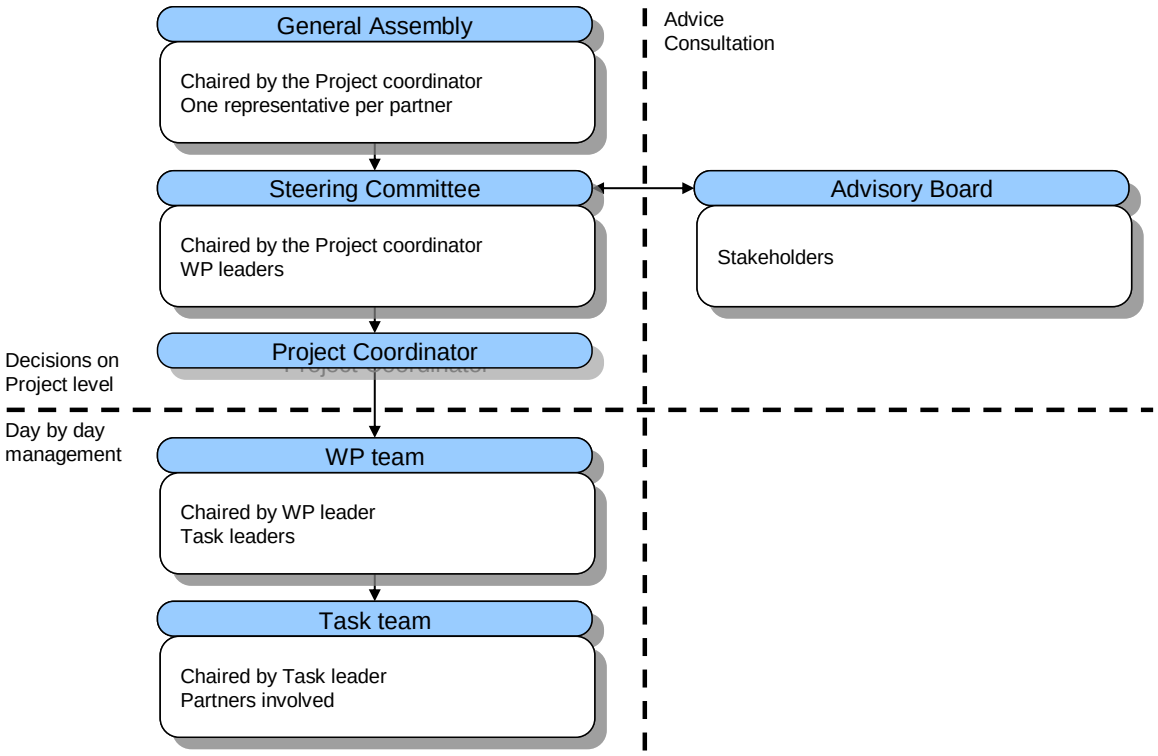

Figure 3.2a. Organizational structure

The organizational structure of the project is represented in Figure 3.2a. The General Assembly is composed by one representative per partner and chaired by the Project coordinator. Decisions at Project level are taken by the Steering Committee, which is chaired by the Project coordinator and composed of all WP leaders. Advise and consultation are provided by an external advisory board to the steering committee. The advisory board is periodically informed of the status of the project and receives copy of all the deliverables. At least one per year it is asked to provide feedback and advises to the steering committee. In particular, the advisory board is requested to review the quality assurance plan and the exploitation analysis and plan. Quality assurance is in charge of the Steering committee.

Day by day management is coordinated at project level by the project coordinator, which is also responsible of inter-WP communication and coordination. Each WP is managed by the WP team, chaired by the WP leader and composed of all the task leaders of that WP. At task level, the activities are managed by the task leader and conducted by the task team, composed by people from all the partners involved in that task.

Dependences among WPs and tasks are monitored and managed by setting specific milestones. The complete list of milestones in reported in Table 3.2a, which provides a description of the means of verification adopted for each milestone.

Table 3.2a: List of milestones

Milestone number	Milestone name	Related work package(s)	Estimated date	Means of verification
1	Kick off meeting	WP1	M01	Meeting agenda and minutes
2	Quality, management and communication plan	WP1, WP5	M03	Website up and running, commitment of advisory board members, D1.1 and D1.2 released
3	Socio-economic analysis, sustainability threats and use cases	WP2	M06	D2.1 and D2.2 released
4	System specification,	WP2, WP4	M12	System requirements,

	performance indicators and testing plan			indicators and testing strategy clearly identified, D2.4, D4.1, D4.2, and D4.3 released
5	First prototype of basic features and implementation plan of advanced features	WP3	M12	D3.2, D3.3, D3.4, D3.5 released
6	Summer school and scientific event	WP5	M15	Program and participants' survey
7	Prototype validated in local pilots, advanced features tested in test beds	WP3, WP4	M18	Working prototypes of advanced features, release alpha running on local pilots, validation results, D3.6, D3.7, D3.8, D4.4, D4.5a, D4.6a, D4.7 released
8	Release alpha, first evidence of exploitation and replication plan, scaling at regional level	WP2, WP5	M24	D3.9, D5.4b, D5.6, and D5.7a released
9	Demonstration	WP2	M27	Program, survey, press, video logs, feedbacks
10	Alpha release validated on the pilots at local, regional, and national level, Beta release refined according to feedbacks from the pilots	WP3, WP4	M30	Working system demonstrated and validated in all the pilots, D3.10, D4.5c, D4.6c, D4.8
11	Industrial event	WP5	M33	Program and participants' survey
12	Final exploitation, and replication plan and strategy	WP5	M36	Feedback from field trials, open data, D5.7b,D5.8 and D5.9 released

KEY

Estimated date
Measured in months from the project start date (month 1)

Means of verification
Show how you will confirm that the milestone has been attained. Refer to indicators if appropriate. For example: a laboratory prototype that is 'up and running'; software released and validated by a user group; field survey complete and data quality validated.

The structure and decision-making mechanisms provide a suitable trade-off between simplicity, effectiveness, governability, and democracy. Innovation management is addressed at all stages of the project thanks to the high presence of stakeholders, representing companies, public administrations, policy makers, and communities. Furthermore, external advisory board members will be invited in order to complement the competences of the consortium with standardization bodies, associations, car and/or smartphone manufacturers. Finally, the high number of external entities who expressed their interest in the project and committed to take part in the pilots provide an additional guarantee of impact.

Critical risks and risk mitigation measures are reported in Table 3.2b.

Table 3.2b: Critical risks for implementation

Description of risk	Work package(s)	Proposed risk-mitigation measures

	involved	
Management risk Probability: low Impact: low	WP1	To facilitate management and risk assessment, a hierarchical structure has been chosen. The Project coordinator, Alessandro Bogliolo, has previous experience in the management of coordinated projects, and the research organization he belongs to, UNIURB, has a long experience in the management of European projects. Further control is provided by the external advisory board.
Responsibility allocation Probability: Medium Impact: Low	WP1	Responsibility will be handled in a hierarchical way, respecting the management structure of the project. Problems related to the allocation of responsibilities (e.g. distribution of development activities, assigning of implementation responsibilities) will be handled at the lowest possible level (inside each Task) to ensure a fast reaction. To reduce the probability of showing up problems related to the allocation of responsibilities during the project, the proposal already assigns clear responsibilities to each partner inside each task. Issues that are not solved within the WPs will be solved in a Steering Committee meeting. If the explicit allocation of responsibilities dictated in the proposal is not enough, solutions may entail reviewing the organisational structure in what concerns WP Leaders and Task Leaders. To this purpose it is worth mentioning that all the key competences of the project are covered by at least two partners, and that there are at least 4 partners involved in each task.
Partner departs from the consortium Probability: Low Impact: Low	WP1	The tasks assigned to the partner will be object of analysis by the Steering Committee. A decision will be made on whether or not a new partner should be added. If the consortium decides not to add a new partner, the tasks will be transferred to another partner, or redistributed across the consortium. The coverage of tasks and competences provided by the partners provides sufficient degrees of freedom.
Serious disputes between consortium members Probability: Low Impact: Medium	WP1	CROWD4ROADS will implement a proactive approach to minimise the probability of disputes by ensuring regular and clear communication between consortium members. WP leaders will follow an attitude of openness and trust, wherever possible. Where pre-dispute areas are suspected, offline discussions will be initiated. Conflicts related to joint ownership issues will be described in the Grant Agreement.
Departure from original technical goal Probability: Low Impact: High	WP3, WP4, WP5	The risk probability is low due to the role of the Quality Assurance Group. In case of deviation from original goal, alerted in time by the Quality Assurance Group, the Project Steering Committee will take immediate action by creating a Scientific Task Force to come up with guidance for the WP leaders involved.
Missing identification of reasonable constrains	WP2, WP3, WP4, WP5	Goals of the WPs involved may have to be re-adjusted. Some new functionalities may be

Probability: Medium Impact: Medium		suggested and the integration effort will have to be strengthened, which may pass by the re-allocation of effort to new integration task force.
Unexpected impact of requirements Probability: Medium Impact: Medium	WP2, WP3, WP4	Redefine some of the development tasks in order to react to the non-expected impact of the requirements. Milestones provide a suitable instrument to monitor the occurrence of this situation and take timely measures.
Flaws in design Probability: Medium Impact: Medium	WP3, WP4	The project relies on parallel intervention in most R&D activities. The presence within the consortium of technical and architectural design competences can allow, in extreme cases, the reallocation of design tasks. Moreover, following an iterative and incremental approach, a considerable number of cross-checks are foreseen in order to early detect possible errors in the system design, therefore minimizing their impact on the overall project development. Inter-task communication will be used to minimize this risk.
Delay in the integration Probability: Medium Impact: Medium	WP3, WP4	Development of single components / features might be delayed and prevent integration with other components. The integration must be limited to the most important and meaningful components to minimise integration overhead. Careful project management and monitoring is required to ensure that the most critical parts will be available in time. If single components become delayed, these components must be integrated by simplified versions. The risk and impact are considered not to be high thanks to the incremental approach adopted, that starts from the integration of available technologies and initiatives, and incrementally adds advanced features and scalability measures.
Delays during the deployment/validation phase Probability: Medium Impact: Medium	WP4	The individual validation phases (test beds, pilots, and demonstration) take too much time to be performed sequentially without delaying other subsequent activities. The number of evaluation experiments must be reduced to a meaningful number, by focusing on evaluations with highest priorities. On the other hand, the incremental approach mentioned above will make it possible to conduct real-world in field trials since the beginning of the second year. Both the functionalities under test and the size of the pilots will scale gradually during the project.
Lack of promotion Probability: Low Impact: High	WP5	The project counts with a specific WP covering dissemination, promotion, as well as exploitation aspects. A specific promotion plan shall be provided within the first 6 months of the project. In the event of delays in such promotion, the Steering Committee will re-evaluate promotion priorities, and provide a revision of the original plan. Given

		the specific nature of this project, the lack of promotion would have a significant impact, possibly impairing the reach of the critical mass. However, the risk is very low for two main reasons: first, because of the direct involved of a large community of 10 member; second, because of the declaration of interests of many stakeholders and influencers. Finally, the incentive and gamification mechanisms developed during the project can provide the instruments to enhance penetration in case of insufficient promotion.
Lack of consensus concerning exploitation strategy to follow Probability: Medium Impact: Low	WP5	The Grant Agreement shall provide the rules to consider in case of lack of consensus. However, the openness adopted as a general principle provides sufficient degrees of freedom to the partners to possibly adopt different exploitation strategies without impairing the impact of the project. Moreover, the nature of the project and the strategy adopted make it possible to exploit the early results of the project since the second year, giving to the consortium the feedback and the time required to react to a possible lack of consensus.

3.3 Consortium as a whole

The consortium is composed of 7 partners from 4 EU countries: Italy, United Kingdom, France, and Romania. The consortium is made of two Academic institutions, two regional public administrations, two not for profit organizations, and a start-up company managing an international ride sharing community.
The large presence of non-academic partners will play a fundamental role in the deployment of real-world pilots and in the exploitation of the results of the project. The partners have complementary competences and experiences which provide a suitable coverage of all the aspects of the project. Figure 3.3.a provides a pictorial representation of the mapping of the main competences of the partners. It is worth noticing that all the elements are covered by at least two partners. The consortium meets the requirements of the call, being highly interdisciplinary and involving many partners playing non-ICT roles in the project.

	UNIURB	MAR	COMUTO	COVUNI	SATEAN	BUCKADV	ABR	
Policy making		x			x	x	x	non-ICT
Public administration		x				x	x	non-ICT
Transportation		x	x			x	x	non-ICT
Community management			x			x		non-ICT
Communication	x		x		x	x		non-ICT
Open data	x	x		x	x	x	x	ICT
Gamification	x			x				ICT
Cloud computing	x	x						ICT
Mobile app dev.	x			x				ICT
Algorithms	x			x				ICT
Academia	x			x				
Not for profit					x	x		
Industrial			x					
Public administration		x					x	

Figure 3.3.a. Mapping of partners' competences and nature.

The project is coordinated by the University of Urbino, which participates through the Department of Basic Sciences and Foundations (DiSBeF) which has a strong experience in national and international coordinated projects. In 2013/2014 DiSBeF has been involved in 5 European projects and 27 technology transfer projects. The role of Scientific coordinator will be played by Alessandro Bogliolo, Associate Professor of Computer systems and coordinator of the School of Information Science and Technology. In

the last three years Alessandro Bogliolo has been involved in the steering committee of the FP7 project ULOOP and he has coordinated many National research projects of public and industrial interest. Since 2012 he has coordinated the SmartRoadSense project (http://www.smartroadsense.it/), that will be used as a basis for the development of CROWD4ROADS.

The distribution of efforts and tasks among partners is well balanced, with efforts ranging from 22 PMs to 65 PMs. All tasks involve at least 4 partners, with the only exception of T3.3, which involves only three partners focused on the setup and configuration of the cloud infrastructure. The main roles of the partners in the project are detailed below in Table 6.

N	Partner	Country	Organisation type	Main roles in the project
1	UNIURB	IT	Academic Institution	Project coordination, Software development, Crowd-Sensing, Mobile applications - Project coordination (WP1) - Leads WP3 - Leads tasks T2.3, T3.1, T3.4, and T4.4
2	MAR	IT	Public administration	Cloud Computing, Transportation, Policy making - Leads WP4 - Leads tasks T3.3 and T4.2
3	COMUTO	FR	Company	Ride sharing and community management - Leads task 5.1 - Takes part in all the WPs
4	COVUNI	UK	Academic Institution	Gamification, Trust management, Incentive mechanisms - Leads tasks T2.2, T3.2, and T5.2 - Takes part in all the WPs
5	SATEAN	RO	Not for profit organization	Land development, Communication, Exploitation - Leads WP5 - Leads tasks T4.3, T5.4
6	BUCKADV	UK	Not for profit organization	Urban development, Smart mobility - Leads WP2 - Leads tasks T2.1, T4.1
7	ABR	IT	Public Administration	Policy making, Land management, Transportation - Leads tasks T1.2, T5.3

Table 6: CROWD4ROADS consortium roles details

3.4 Resources to be committed

Table 3.4a: Summary of staff effort

Please indicate the number of person/months over the whole duration of the planned work, for each work package, for each participant. Identify the work-package leader for each WP by showing the relevant person-month figure in bold.

Participant Number/Short Name	WP1	WP2	WP3	WP4	WP5	Total Person/ Months per Participant
1/UNIURB	**7**	9	**27**	14	8	**65**
2/MAR	3	3	11	**19**	4	**40**
3/COMUTO	1	6	14	11	9	**41**
4/COVUNI	**1**	5	**14**	4	6	**30**
5/SATEAN	3	7	13	19	**19**	**61**
6/BUCKADV	3	**7**	0	8	4	**22**
7/ABR	4	3	0	9	14	**30**

Table 3.4b: 'Other direct cost' items (travel, equipment, other goods and services, large research infrastructure)

Please complete the table below for each participant if the sum of the costs for' travel', 'equipment', and 'goods and services' exceeds 15% of the personnel costs for that participant (according to the budget table in section 3 of the proposal administrative forms).

2/MAR	Cost (€)	Justification
Travel	12,000 3,000	Participation of 1-2 people to 6 project meetings and 2 events organized by the partners Participation of 1-2 people to 2 workshops/conferences
Equipment	33,977	Hardware/network appliance and ICT services - 3Tb storage, 3 physical servers hosting 2 front-end virtual servers and 4 back-end/cluster PostgreSQL db virtual server 50 smartphones to be used to involve into the pilots local public transportation companies
Other goods and services	1,500 3,000 28,545	Hosting of 1 project meeting Organization of a demo Subcontracting of technical assistance for administrative and financial management to Lattanzio Advisory Spa, following Regional Decree n.211/POC of 18/12/2013 about public tender procedure according to Italian National Law D. LGS. n. 163/2006. Contract n° 1271 signed on 15/09/2014).
Total	53,477	It is worth mentioning that the total cost for travel, equipment, goods and services for MAR exceeds 15% of its personnel costs because MAR will take care of setting up and maintaining the cloud infrastructure used to deploy the CROWD4ROADS platform in all the pilots.

4/COVUNI	Cost (€)	Justification
Travel	12,000	Participation of 1-2 people to 6 project meetings and 2 events organized by the partners

	9,000	Participation of 1-2 people to 6 workshops/conferences
Equipment	0	No costs for equipment to be exposed
Other goods and services	1,500 3,000 6,000	Hosting of 1 project meeting Organization and hosting of a scientific event 3 golden publications
Total	31,500	It is worth mentioning that the total cost for travel, equipment, goods and services for COVUNI is slightly higher than 15% of its personnel costs because of the intense dissemination activity that will entails traveling and publication costs above the average.

Please complete the table below for all participants that would like to declare costs of large research infrastructure under Article 6.2 of the General Model Agreement[1], irrespective of the percentage of personnel costs. Please indicate (in the justification) if the beneficiary's methodology for declaring the costs for large research infrastructure has already been positively assessed by the Commission.

Participant Number/Short Name	**Cost (€)**	**Justification**
Large research infrastructure		

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[1] Large research infrastructure means research infrastructure of a total value of at least EUR 20 million, for a beneficiary. More information and further guidance on the direct costing for the large research infrastructure is available in the H2020 Online Manual on the Participant Portal.

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Section 4: Members of the consortium

4.1. Participants (applicants)

4.1.1 Università degli Studi di Urbino "Carlo Bo" (UNIURB) (http://www.uniurb.it/)

Description of the legal entity

The University of Urbino (UNIURB) is a medium-sized Italian State University founded in 1506 in Urbino, a Renaissance city recently included in the list of Unesco World Heritage sites. At present it counts about 450 faculty members and 15,000 students. It numbers 8 Departments and 17 Schools in 3 Research Areas: SCIENCES, with the Department of Biomolecular Sciences (DISB), the Department of Earth, Life Sciences & Environment (DISTEVA), and the Department of Basic Sciences and Foundations (DiSBeF); HUMANITIES, with the Department of Humanities (DIPSUM), the Department of International Studies, History, Languages, Cultures (DISTI), and the Department of Communication and Human Studies (DISCUM); and LAW, ECONOMICS, POLITICS, SOCIETY, with the Department of Economics, Society & Politics (DESP), and the Law Department (DIGIUR).

The University of Urbino will participate in the project with the Information Science and Technology Unit of DiSBeF, which has a long-term experience in cooperative research projects, innovation, and technology transfer. The last European projects in which the DiSBeF has been involved are: ULOOP "Use-centric Wireless Local Loop" (grant agreement 257418), Ice2Sea "Estimating the future contribution of continental ice to sea-level rise" (grant agreement 226375), Accent Plus "Atmospheric Composition Change, the European Network, Policy Support and Science" (grant agreement 265119), SEFIRA "Socio Economic Implications for Individual Responses to Air Pollution in EU", and GTrace "Dynamics of Terrestrial Gravity Perturbations" (Marie Curie International Incoming Fellowship). In addition, in 2013-2014 the Department has been involved in a Tempus project, into 2 POR-FSE Regional projects, and in 27 technology transfer projects.

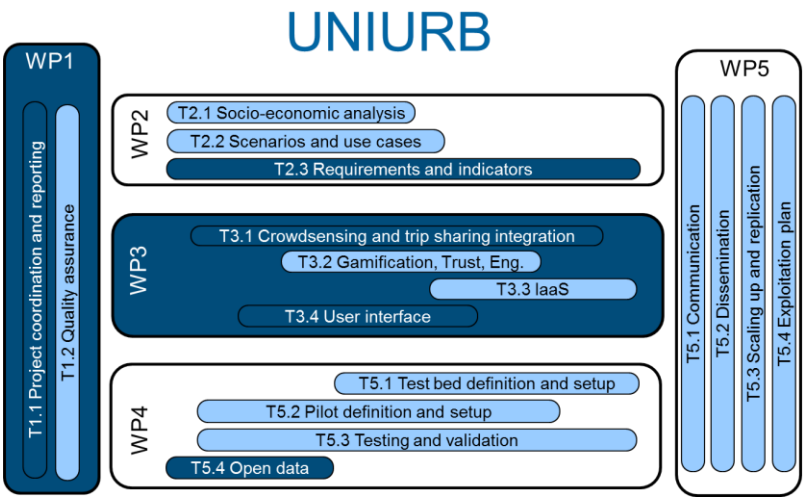
Since 2013, the University of Urbino has been working at SmartRoadSense (http://smartroadsense.it/), a crowd-sensing open-data system that exploits the accelerometers of car-mounted smartphones to monitor the quality of the road surface.

Role in the project

UNIURB will be the coordinator of CROWD4ROADS, participating in the project with an interdisciplinary team which involves Electrical engineers and Computer scientists working in the fields of digital signal processing, wireless sensor networks, cloud computing and mobile applications.

The following figure represents the main competences provided by UNIURB and its role in the project (dark blue denotes task or WP leadership, light blue denotes participation in a task).

	UNIURB		
Policy making			non-ICT
Public administration			
Transportation			
Community management			
Communication	x		
Open data	x	ICT	
Gamification	x		
Cloud computing	x		
Mobile app dev.	x		
Algorithms	x		
Academia	x		
Not for profit			
Industrial			
Public administration			



Short CVs of key persons

- **Prof. Alessandro Bogliolo (M)** is Associate Professor of Computer Systems, he is the Coordinator of the Information Science and Technology School of the DiSBeF of the University of Urbino, Italy. He got a Laurea Degree in Electrical Engineering (1992) and a Ph.D. in Electrical Engineering and Computer Science (1998) from the University of Bologna (IT). In 1995-1996, he was at the Computer Systems Laboratory of the Stanford University, Stanford (CA). From 1999 to 2002, he was Assistant Professor at the University of Ferrara (IT). In 2002 he joined the University of Urbino where he currently leads a research group focused on Future Internet models, multimedia, mobile applications, and wireless sensor networks. In these fields he co-authored more than 150 peer-reviewed international publications. He has coordinated research activities in many national and international research projects, funded by the European Commission (Grundtvig, FP5, FP7), the Italian ministry of University (PRIN), the Italian government (ICT4University), Regione Marche (CIPE), and the Semiconductor Research Corporation. Since 2013 he has been the project leader of SmartRoadSense.
- **Dr. Valerio Freschi (M)** received the Laurea degree in Electrical Engineering from the University of Ancona (Italy) in 1999 and the PhD degree in Information Engineering from University of Ferrara (Italy) in 2006. Since 2009 he is Assistant Professor in the Department of Basic Sciences and Foundations (DiSBeF) at University of Urbino, Italy. His research interests include wireless embedded systems, sensor networks, graph algorithms, bioinformatics, optimization. Since 2013 he has been working at the SmartRoadSense project.
- **Dr. Emanuele Lattanzi (M)** is currently an Assistant Professor of Computer Systems in the Department of Basic Sciences and Foundations (DiSBeF) at University of Urbino, Italy. He received the Laurea degree (2001) and the Ph.D. (2003) from the University of Urbino. In 2001, he joined the Information Science and Technology Institute of the University of Urbino. In 2003, he was with the Department of Computer Science and Engineering at the Pennsylvania State University, working as a visiting scholar. His main research interests are in the areas of wireless sensor networks, environmentally-powered embedded systems, computer simulation, and modelling.

Relevant publications, and/or products, services

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4. Emanuele Lattanzi, Alessandro Bogliolo, **VirtualSense: A Java-Based Open Platform for Ultra-Low-Power Wireless Sensor Nodes.** INTERNATIONAL JOURNAL OF DISTRIBUTED SENSOR NETWORKS (ISSN:1550-1329), 16 2012.
5. Sofia,P. Mendes,M. J. Damasio,S. Henriques,A. Bogliolo,F. Giglietto, E. Giambitto, **Moving Towards a Socially-Driven Internet Architectural Design.** COMPUTER COMMUNICATION REVIEW (ISSN:0146-4833), 39- 46 8 43, 2012.

Relevant previous projects or activities

- **SmartRoadSense**: Innovation and technology transfer project, conducted in cooperation with NeuNet cultural association and partially supported by a local public transportation company, which makes use of the accelerometers embedded in any smartphone to monitor the quality of the road surface (http://smartroadsense.it/).

- **ULOOP**: ***User-centric wireless local Loop***. FP7-ICT, 09/2010-12/2013. ULOOP developed the technologies to exploit the potential of Wi-Fi enabled end-user equipment to extend and complement Internet access networks.

- **VirtualSense:** Research project of the University of Urbino, in cooperation with NeuNet (http://www.virtualsense.it/). Open-hardware initiative aimed at the development of a ultra-low-power platform for wireless sensor nodes featuring a Java-compatible virtual runtime environment.

Infrastructure and/or Technical equipment

UNIURB will make available to the project a working prototype of SmartRoadSense, composed of Android apps, server-side applications, geospatial databases, and web frontend.

4.1.2 Regione Marche (MAR) (http://www.regione.marche.it/)

Description of the legal entity

MAR is the institutional government of Marche Region, one of the 20 Regions of Italy, and it carries out a wide series of legislative, administrative and executive functions.
The Marche region extends over an area of 9,694 squared kilometers, in a strategic position in the Balkan-Mediterranean area and in the recently established Adriatic Ionian macro region. Hills cover 68.8% of its territory, while the remaining 31.2% is mountainous. The region has 1,569,578 inhabitants and 236 Municipalities. Almost all these municipalities are very small: only 15 of them have more than 20 000 inhabitants, with a rate of urbanization (45%) lower than in other regions of Central Italy (64.4%), and lower than the national average (51.9%).
The territory has a total length of highways and national and local roads of more than 5,500 kilometers, and in particular the relationship "*kilometers of regional and provincial roads for every 10,000 inhabitants*" is 31.1, above the national average (25.6).
Although small, Marche region is one of the most industrialized regions in Italy and it is considered a region of excellence, not only for its economic performance, but also for its cultural, natural and social richness, which continues to draw tourists. Its model of development is based on a myriad of small and medium-sized enterprises (SMEs) once located in specialized industrial districts, which have been characterized by a high level of creativity and innovation in the past. The constant acceleration of globalization over the last few years has changed the international competitive system and has made it necessary to quickly handle these drastic changes in a larger, not local, dimension. As a result, and as represented in MAR's Smart Specialisation plan and in its local Digital Agenda and the derived "eCluster" strategy, many economic and politic players have contributed and will contribute to create important technology clusters and international business networks, also related to the areas of information and communication technologies, social innovation, smart cities and communities, creative and digital economy.
Indeed the Digital Agenda of Marche Region (ADM) represents a new shared and enhanced strategy of the Information Society, complying to the Flagship initiative Digital Agenda for Europe promoted within the framework of the Europe 2020, the national program Digital Agenda for Italy and the results and suggestions of the regional scientific committee involved in the "Marche +20" initiative.

MAR will participate in the project with its ICT department, which has a long-term experience in projects related to the provisioning of digital services and has started to pay particular attention to key paradigms such as cloud computing, social network, semantic web, open data, mobile applications, crowdsourcing, Internet of Things and other useful and promising scenarios for the creation of innovative services, enterprises and jobs of the digital economy.
MAR will also involve its regional traffic, mobility and transport management office, which is already participating in several local, national and European projects related to the specific addressed case study.

Role in the project

MAR contributes to the project mainly in three ways:

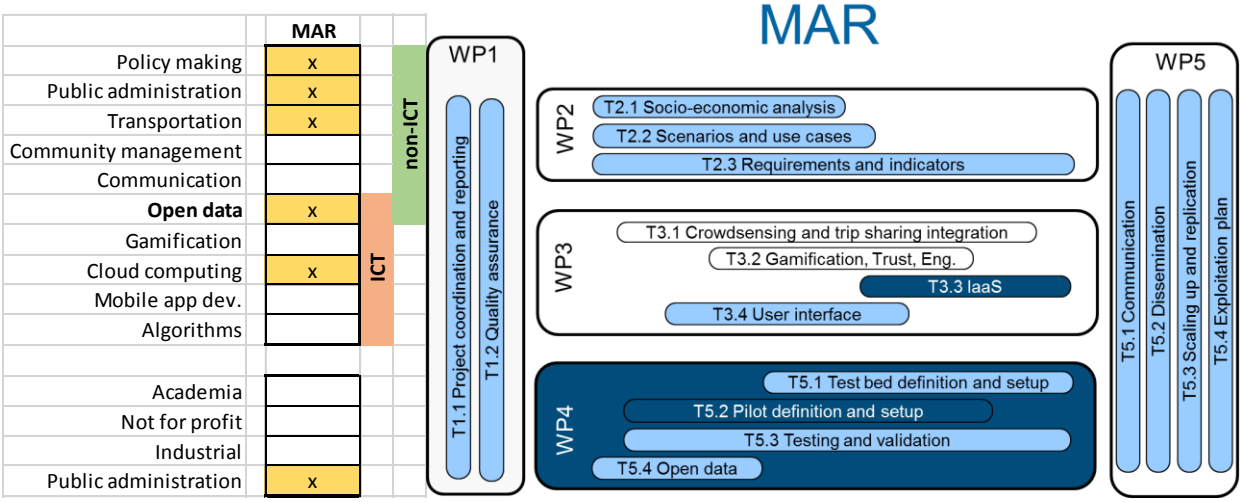
- hosting the provided software solutions in its cloud infrastructure (Mcloud);
- involving local Public Administrations and companies of the local public transportation system (organized into 5 consortia that are managing together more than 1.300 buses) in the testing and the starting up of a distributed and participated detection system. In particular bus drivers will become detectors in order to build a permanent monitoring system on the decay rate of the quality of roads and mapped routes over time.

- reusing available Open Data for policy making and planning, transforming information and calculating KPIs, dependent on the state of the regional roads, for institutional purposes (in particular the commercial speed of public transport fleets).

MAR is also interested in experimenting and exploring the project results using the proposed approach and prototype for the future development of its territory. At the same time project results could contribute to the definition of a national and international approach focusing on interregional partnerships, e.g. the "*Italia Mediana"* agreement between the 5 Regions of central Italy (DGR n. 203/2015) to collaborate in the 2014-2020 programming period on the subjects of the local Digital Agendas; or the Adriatic Ionian macro region initiatives under the pillar II – connecting the macroarea.
Moreover MAR has a specific public and collective interest in the themes related to local roads management, regional road transport development policies, updating of the cadastre of provincial roads, city planning, road safety and maintenance, efficiency of public investments in the construction sector, car sharing, Co2 emission reduction and so on.

In particular MAR will be the leader of WP4, responsible for the deployment of the pilot in a cloud computing environment and its validation by local end users.

The following figure represents the main competences provided by MAR and its role in the project (dark blu denotes task or WP leadership, light blue denotes participation in a task).



Short CVs of key persons

- **Dr. Serenella Carota** (F) is the executive director of the ICT department in the Marche Region. She received her degree in Information Science at the University of Pisa. She is an expert of e-government processes and innovation in Public Administration, with focus on the provision of digital services to citizens and businesses. Author of various publications, she also teaches software design and other courses related to ICT innovation in Public Administration. She is also a member of numerous regional and national working groups concerning federated IT protocol, document management, interoperability, public connectivity, cloud computing and data sharing.
- **Dr. Maria Laura Maggiulli** (F) is the chief technical professional of the regional control center for telecommunication networks, security, storage and ICT systems. She received her degree in Information Science at the University of Turin. She is the officer in charge for the telematic regional plan for the development of broadband. She has a supporting role in the design of the regional architectural system used in the experimentation, in the revision and the

implementation of the technical contents and in the coordination of the activities involving the use of regional instruments, infrastructures and systems.

- **Dr. Andrea Sergiacomi** (M) is a member of the ICT department in the Marche Region, responsible for providing integrated public services to citizens and regional communities through Intranet and Internet web portals, front-end and mobile applications. He received his degree in Economics from the University of Ancona. He is an expert of web accessibility and usability and he deals with European funding and ICT project design and submission. Currently he is the project manager for the MCloud SaaS infrastructure and he is the officer responsible for the programming and the implementation of the Marche Digital Agenda initiative and the ICT interventions on 2014-2020 Marche POR FESR. He coordinates many internal technicians and developers and is also the director of the execution of recent tenders for the deployment and provisioning of cloud computing and mobile digital services. Author of various publications, he is an academical tutor in the area of computer science, algorithms and data structure. He is also a member of numerous regional and national working groups and coordination units with the aim to provide guidelines for Public Administration web sites and government open data.
- **Ing. Cinzia Montironi** (F) and **Ing. Gabriele Frigio** (M) are members of the regional traffic, mobility and transport management office. They follow the relationships with local authorities and stakeholders and the activities of the permanent observatory on mobility. In particular she participates in many national and EC projects related to the subject of transport and sustainable mobility; he manages ICT projects involving the transportation sector. They will provide a contribution to the analysis and organization of the pilot to be activated, involving the local actors and disseminating the project results.

Relevant publications, and/or products, services

1. C. Amici, G.M. Bilei, S. Carota, F. Cirillo, C. Diamantini, L. Fanò, M.L. Maggiulli, D. Potena, B. Re, D. Salomoni, A. Sergiacomi, D. Spiga, et al.. **Prototyping a Cloud Ecosystem for a Regional Public Administration**. In Proceedings of the ISGC International Symposium on Grids and Clouds (ISGC). PoS (ISGC 2014) 009. March 2014.
2. C. Amici, G.M. Bilei, S. Carota, F. Cirillo, C. Diamantini, L. Fanò, M.L. Maggiulli, D. Potena, B. Re, D. Salomoni, A. Sergiacomi, D. Spiga, et al.. **A Cloud-based solution for Public Administrations - the experience of the Regione Marche**. In the 2014 International Conference on Collaboration Technologies and Systems (CTS 2014), May 2014.
3. D. Cacciagrano, S. Carota, E. Merelli, A. Sergiacomi, L. Vito. **Semantics on the Cloud: Toward an Ubiquitous Business Intelligence 2.0 ERP Desktop.** SEMAPRO 2012 : The Sixth International Conference on Advances in Semantic Processing (ISBN: 978-1-61208-240-0), Copyright (c) IARIA, July 2012.

Relevant previous projects or activities

- **MCloud (Marche Cloud)**, an hybrid cloud computing open source infrastructure realized by MAR through its datacenter enhancement, supplying modern, high technological and innovative digital contents and services to enterprises, public institutions and civil society, in view of a more efficient security, performance and effectiveness of the systems; born as a IaaS prototype, the MCloud infrastructure is being strengthened towards PaaS and SaaS levels, thanks to the contribution of new wider projects such as "Open City Platform", "Cloud4Europe", "Adriatic Ionian Cloud" and MAR's internal activities to project and release a real multi-tennants – autoscaling – elastic – software defined and virtualized data center.
- **Marche GoOD PA** (Government Open Data) with particular regard to the datasets released in the process for traffic and transport data flow optimisation and sharing (mobile information, schedules of local public transport, …).

- The development of many other strategic platforms, digital services, information systems and integrated and systemic projects (**Mpay, Mcube, VideoHub, Login, GeoServices, NeSSo, ...**) for e-Commerce, online payments and electronic invoicing, internationalization of business and economy, e-Learning, Smart Education, Digital literacy, e-Government, Citizen records, eHealth, semantic web and social networks for smart communities and so on, promoted and implemented within the framework of the ADM and of the 2014-2020 programming period (Marche POR FESR).
- Specific projects and activities related to the transport sector, mostly European, such as **TASMAC** (Tourism Accessibility in SMall Attractive Cities), **TWIST** (demand responsive Transport WIth a Social Target, in mountain and rural areas), **AUTO INSIEME** (car pooling).

Infrastructure and/or Technical equipment

MAR will make available to the project the Mcloud IaaS infrastructure, hosted in its TIER 2 datacenter of Ancona, in order to support the deploy and the technical implementation of the pilot's software solutions.

MCloud is entirely powered by open source technologies and platforms, such as OpenStack Grizzly (which is been migrating to the Juno version), Linux (CentOS 7 and Ubuntu 14.04) and KVM. It presents a hybrid and flexible architecture in terms of implementation models (prefiguring multiple scenarios in the supply and use of services: multi-tenancy; isolation and segmentation of virtual instances for individual organizations, locations, groups of users).

It adopts security specifications that ensure compliance with:

- the requirements and the network, telematics and systems policies of MAR
- the Italian legislation in terms of privacy, data protection and legal aspects related to the service level agreement between providers and cloud users
- the international reference standards and guidelines for the implementation and hosting of PA information systems

It also ensures high level of interoperability, horizontal scaling capability, reliability and availability of hosted solutions.

Specifically for the purposes of the project, the infrastructure will be properly expanded in terms of storage capability, network bandwidth, security features, computing performance.

MAR will also allow the use of its GoOD PA Platform (http://goodpa.regione.marche.it/), an open source web portal based on the CKAN solution, useful to publish, search and make available apps and open data produced by one or more organizations.

4.1.3 Comuto Sa (COMUTO) (http://www.BlaBlaCar.it/)

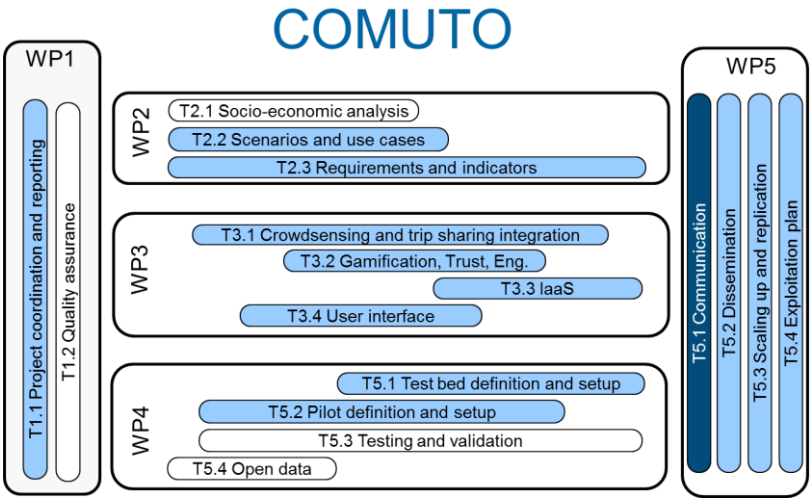
Description of the legal entity

COMUTO is the world leader company in ride sharing. A successful and innovative global start-up, backed by Accel Partners and Index Venture, in a rapid international growth phase. The HQ is based in Paris and it has international teams in Madrid, Milan, Warsaw, Hamburg, London, Moscow, Istanbul and New Delhi. Its main service, BlaBlaCar, is provided in 18 countries: France, Spain, UK, Italy, Poland, Hungary, Croatia, Serbia, Romania, Germany, Belgium, India, Netherland, Luxembourg, Portugal, Ukraine, Russia and Turkey. With dedicated customer service, state of the art web and mobile platforms, and a highly engaged community of users, BlaBlaCar is making road travel fun, money-saving and more sustainable. Today BlaBlaCar counts more than 10 million members and more than 2 million travelers each month and the company counts 250 employees.

Role in the project

COMUTO takes part in the project bringing its community-building and trip-sharing expertise to develop region-wide and country-wide pilots. Moreover, it will play an active role in the development of replication, scalability and exploitation strategies.

	COMUTO	
Policy making		non-ICT
Public administration		non-ICT
Transportation	x	non-ICT
Community management	x	non-ICT
Communication	x	non-ICT
Open data		ICT
Gamification		ICT
Cloud computing		ICT
Mobile app dev.		ICT
Algorithms		ICT
Academia		
Not for profit		
Industrial	x	
Public administration		



Short CVs of key persons

- **Dr. Andrea Saviane (M)** is Country Manager Italy for BlaBlaCar, the world's largest ridesharing community. Andreagraduated with first class honours in Marketing and Communications at Università Ca' Foscari Venezia (2002-2008). In 2008 he started his career on online marketing, joining a WPP web agency as a digital strategist. After three years in managing web projects for some of leading Italian companies and brands, he joined a Consumer Electronics startup project (2011) as Marketing and Communications manager. In two years the company established as one of the fastest growing manufacturing companies in Italy and received several Italian and International awards for young entrepreneurship and creative business modeling (2012-2013). In mid 2013 Andrea joined BlaBlaCar as a Marketing manager, with the aim of managing marketing activities and of driving BlaBlaCar's growth in Italy. Since September 2014 he is Country Manager Italy at BlaBlaCar and he manages its Italian branch in Milan. As a strong supporter of sharing economy and sustainable development, Andrea shares BlaBlaCar's mission to create a new global eco-friendly transport network.

- **Dr. Franco Lo Giudice (M)** is the community and event manager of BlaBlaCar Italy. He takes part in every aspect of communication strategy: social media, community management, Pr, partnerships, events, internal communications. He is a trustworthy professional that is great at organizing events, with great communications and business skills along with a great in depth knowledge of marketing and sales. He has the experience needed to plan to perfection the work necessary to reach set goals by choosing the right strategy. He has excellent problem solving skills and a natural ability in to manage complex situation that are rich of opportunities. He also have good leadership skill, as well as great interpersonal skills such as listening, analyzing and great insight regarding new business. In BlaBlaCar since 2012, before he worked for GL Events, Salone Internazionale del Libro, easyFairs Group.

Relevant previous projects or activities

- **BlaBlaCar**: a **trusted community** marketplace that connects drivers with empty seats to passengers looking for a ride. Over 2 million people use BlaBlaCar every month creating an entirely new, people powered, **transport network**. With a dedicated customer service, a state of the art web and mobile platform, and a fast-growing community of users, BlaBlaCar is making travel social, money-saving and more efficient for millions of members. In numbers, BlaBlaCar counts about 10 million members in 18 countries, with over 2 million members travelling with us every month, over 2 million trips available in the future at any given time, over 3 billion miles shared, an estimated £216 million saved by our drivers every year, an estimated 700,000 tons of CO2 saved, an average car occupancy rate of 2.8 (vs 1.6), and over 5 million app downloads.

- **The D.R.E.A.M.S. Framework**: After years of market experience, the founders of BlaBlaCar, Frédéric Mazzella and Nicolas Brusson, learned that there are specific components to be deployed to create trust in an online community and enable the success of a peer-to-peer service. They quickly realised that their learnings could be extrapolated to all kinds of online sharing services, beyond ride sharing and across verticals. As a new framework for the collaborative economy, it's aptly named D.R.E.A.M.S. In sharing it, the entrepreneurs hope to bring valuable knowledge and insight to other leaders of the sector, empowering a shared dream of a better, more collaborative, world (http://www.betrustman.com/)

Infrastructure and/or Technical equipment

COMUTO will make available to the project the BlaBlaCar community and its technical infrastructure.

4.1.4 Coventry University, UK (COVUNI) (www.coventry.ac.uk)

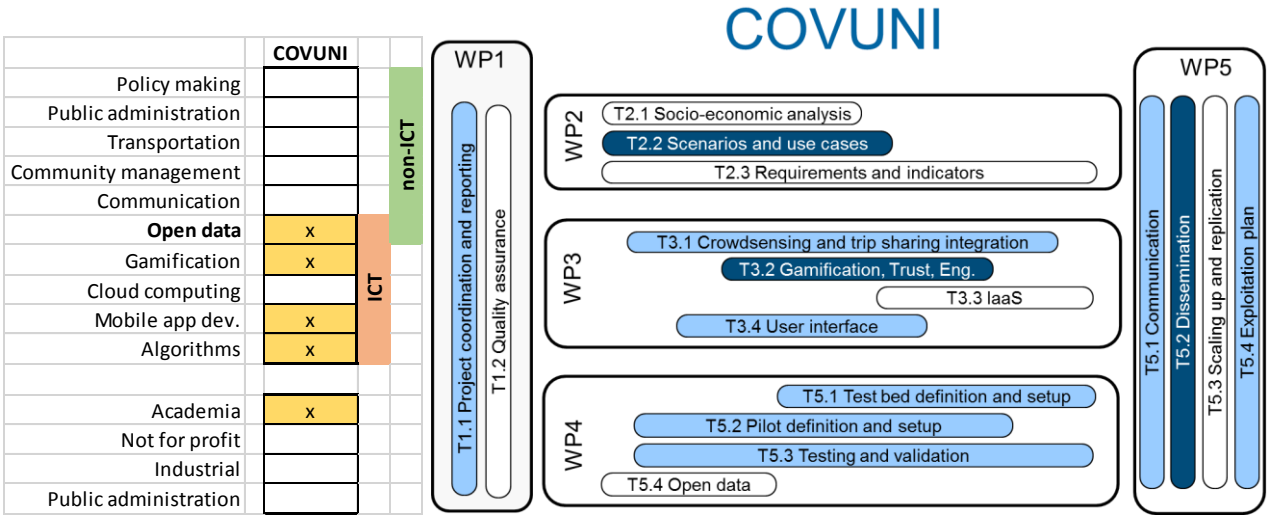
Description of the legal entity

Coventry University (COVUNI) is a top post-1992 university in the UK and a leader in applied research. Voted UK Entrepreneurial University of the Year in 2011, Modern University in 2013/14/15 and top in Students Satisfaction 2014, the university has a reputation for student satisfaction, business engagement, innovation and entrepreneurship. The university has an excellent track record in engagement with Europe and European research and development and is the No. 1 UK University for European placements. COVUNI has a wide experience in coordinating EU projects such as IRSES, ECODRY, RICHES, SWING, REPLACE2 and CLUSTER2020. Track records also including coordinating the R&D work package as the Scientific Coordinator for the EU Funded Games and Learning Alliance (GALA) network of excellence in SGs. COVUNI is a member of European Network of Living Labs (ENoLL), European Business Network (EBN) and European Regions for Research Innovation Network (ERRIN). The participation will be via COVUNI's Disruptive Media Learning Lab (DMLL) that is capitalising on research and development excellence in innovative pedagogies and technology-enhanced learning across the university, including excellence in game-based learning R&D of the Serious Games Institute (SGI), part of the Engineering and Computing Faculty. Two of the key strands (research, development and innovation) at the DMLL is adaptive and pervasive learning, and gamification for innovative teaching and learning.

Role in the project

COVUNI will provide an expertise in pedagogy-informed and holistic approach in gamification design and development.

The following figure represents the main competences provided by COVUNI and its role in the project (dark blu denotes task or WP leadership, light blue denotes participation in a task).



Short CVs of key persons

- **Dr Sylvester Arnab** (M) – Dr. Sylvester Arnab is a Senior Research Fellow (games science), co-leading research at the DMLL, building on his R&D experience at the Serious Games Institute, UK. To date Sylvester has over 50 academic publications, including one edited book- Serious Games for Healthcare. He has also keynoted at events related to serious games, gamification and technology-enhanced learning. Sylvester is a founding member of the Serious Games Society (seriousgamessociety.org/) and Health 2.0 Birmingham. He is also in the steering group committee for Games for Health UK, the UK satellite hub for Games for Health Europe. Besides leading projects related to pervasive learning and gamification at the DMLL, Sylvester is also currently leading CU's contribution to the Erasmus+ Gamification for the Hard-to-Reach project, and he has successfully coordinated the R&D work package within the EU-Funded Games and Learning Alliance (GALA, galanoe.eu). He has project managed the development of a game for Relationships and Sex Education (PR:EPARe), which won an Outstanding Contribution to Health Psychology award in 2013. He was also named as a co-investigator on the EU Funded PEGASO and MAGELLAN projects. To date, he has successfully won projects worth over £700K including FP7 and Erasmus+. Other awards include the Research Collaboration Fellowship to Boston in 2015, Prime Minister's Initiative Partnership Development Grant for UK/ASIA in 2010 and the EU Transversal Programme Study Visit fund in 2011. He is also an expert reviewer for the EPSRC and Wellcome Trust as well as various high-impact journals and conferences.

- **Sinead Ouillon** (F) - is the Programme Leader of the City University Initiative. Sinead works in the Centre for Trust, Peace and Social Relations, managing an innovative community engagement initiative to improve the interface between the City, its citizens and the University. The City Initiative includes; Get Creative, creating new "safe places" for bringing people together to learn and share experiences, in 2015 this includes 1,000 local people participating in creative activity as part of the People's Olympics with 10 other cities and 10,000 to participate in 2016. Within 3 years the Initiative will engage up to 20% of the Coventry population or 60,000 people. Impact will demonstrate distance travelled for the city and individuals by highlighting the evidence and individual success stories. Prior to this Sinead set up citylabcoventry.org and through its relationship with the European Network of Living Labs (EnoLL) worked as an evaluator for EnoLL. City Lab Coventry manages co-created user centred trials of now products and services such as the CABLED trial of 100 electric and Hydrogen vehicles and the Home monitoring system for the older population. Sinead has an educational background in International Political Economy and a professional background in management consultancy, having previously worked as a bid writer and management consultant for over 10 years, securing funding for a range of organisations in excess of £20m. She also set up a Living Lab, www.citylabcoventry.org. Sinead has worked on FP6, 7 and H2020 projects and proposals. Sinead has also been an evaluator for the European Leonardo da Vinci Programme and European Structural funds in the UK.

- **Dr. Roy Bakta** (Male) – Dr Roy Bakta is a Senior Researcher at the DMLL with a research focus on student engagement, using technology to support learning and the development of STEM (including mathematical skills) in the HE sector. He has worked closely with the sigma-cetl research group at Coventry University on numerous research projects looking at attitudes towards mathematics and student identity, subsequently contributing to 2 journal papers, 6 conference proceedings and 9 conference talks. Roy has experience of teaching students in the Secondary, FE and HE sectors.

Relevant publications, and/or products, services

1. **Arnab S.,** Lim T., Carvalho M. B., Bellotti F., de Freitas S., Louchart S., Suttie N., Berta

R., De Gloria A. (2015) **Mapping Learning and Game Mechanics for Serious Games Analysis,** British Journal of Educational Technology. doi: 10.1111/bjet.12113
2. **Arnab,S.,** Brown,K., Clarke,S., Dunwell,I., Lim,T., Suttie,N., Louchart,S., Hendrix,M., de Freitas,S. (2013). T**he Development Approach of a Pedagogically-Driven Serious Game to support Relationship and Sex Education (RSE) within a classroom setting.** Computers & Education 69, 15-30
3. **Arnab,S.,** Berta,R., de Freitas,S., Earp,J., Popescu M., Romero,M., Stanescu,I., Usart M. (2012). **Framing the Adoption of Serious Games in Formal Education. Electronic Journal of e-Learning .** ISSN: 1479-4403
4. Tombs, G., **Bhakta, R.** & Savin-Baden, M. (2014) **'It's almost like talking to a person': Student disclosure to pedagogical agents in sensitive settings.** Ninth International Conference on Networked Learning 2014, Edinburgh, April 7-9
5. Kiili, K., Lainema, T., de Freitas, S., & **Arnab, S.** (2014). **Flow framework for analyzing the quality of educational games,** Entertainment Computing, Elsevier DOI: 10.1016/j.entcom.2014.08.002

Relevant previous projects or activities

- **GALA** (Framework 7): The GALA network aims to shape the scientific community and build a European Virtual Research Centre (VRC) aimed at gathering, integrating, harmonizing and coordinating research on Serious Games and disseminating knowledge, best practices and tools as a reference point at an international level.
- **Pergamon** (H2020): COVUNI are partners in this H2020 project to develop a pervasive gaming platform that EU SMEs will be able to access to develop their own specific pervasive games
- **Pegaso** (Framework7): The PEGASO project will develop a multi-dimensional cross-disciplinary ICT system that will exploit sophisticated game mechanics to motivate behavioral changes towards healthier lifestyles and prevent overweight and obesity in the younger population.
- **Magellan** (FP7): COVUNI is part of the R&D of location-based games for the creative industry that is in line with BEACONING technological approach.
- **Gamification for H2R** (Erasmus+): COVUNI is involved in a gamification initiative to engage and help build capacity of vulnerable groups in Europe towards transitions into employment and life long learning.

Infrastructure and/or Technical equipment

- Business Development Support and post-award support centrally provided by Coventry University to support project coordination (administration and financial support).
- An office dedicated to the management of international projects
- Best practices, existing findings and equipments across the university on technology-enhance learning, serious games research, Gamification, mobile application development
- Experimental space at the Disruptive Media Learning Lab to allow demonstrations, focus groups and pilot testing for platform validation.

4.1.5 Fundatia Satean, (SATEAN) (http://www.satean.ro)

Description of the legal entity

Satean is a private organisation. The organisation has a staff composed of 15 employees and its mission is linked to sustainable development and development cooperation. The organisation was founded in 2007 thanks to the participation of private and public bodies, both Romanian and transnational.

In order to enhance the development and cooperation the organisation carried out 15 projects financed by Romanian structural funds, manage 2 TOI Leonardo projects in collaboration with the Universities and public bodies, 1 LLP project and participate as a partner in a Horizion 2020 project with the Univeristy of Copenhagen.

The foundation took part in several national programmes for the human capital development (POSDRU, European Social Funds in Romania) with particular interest in new careers and in the qualification of the labour market.

It implemented projects together with the national network of employment offices (AJOFM) and other projects finalized to the revision of university curricula in the innovative economic sectors.

Satean has a wide and important network of collaborations and partnerships with universities, ministerial agencies, charitable institutions and chamber of commerce.

Satean is also an adult training institution accredited by the Labour Ministry, authorized by the national agency of qualifications (ANC), and constituted in collaboration with the University Danubius of Galati the Business school CisPro Srl to offer high-level training, carry on research projects and manage innovative university spin-off.

The institution founded and coordinated the CLIPA of Bucarest with the aim to promote innovative entrepreneurship and endorse start-ups in collaboration with the national network of professional training companies.

Fundacia Satean reached a wide expertise in logistics and new technologies and realized three analysis concerning strategies and urban planning related to the re-engineering of professions and specializations necessary to the new exigencies of the construction development.

The institution in collaboration with the University Danubius of Galati and the Business school realized the informative system of traceability a and analysis of data and an e-learning and distribution of data informative system.

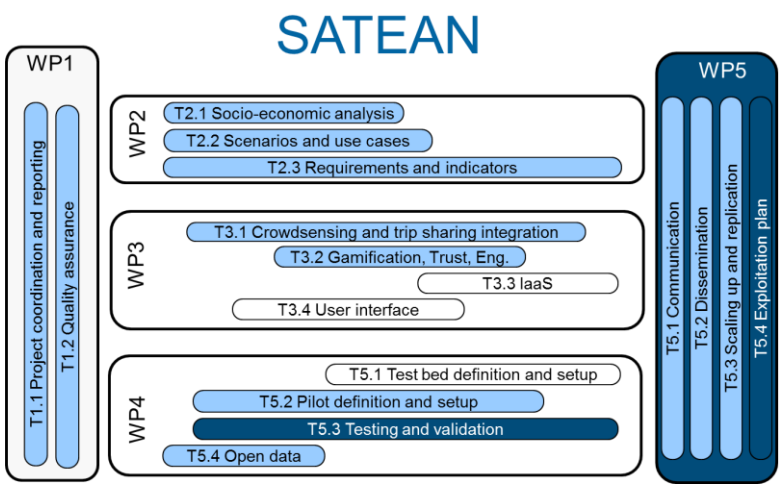
Satean has a specialized department in “process management”, system analysis and planning/implementation of informative systems and portals.

Role in the project

SATEAN will provide its expertise in communication, dissemination and exploitation and it will exploit its networking capabilities in Romania to conduct a grassroots country-size pilot.

The following figure represents the main competences provided by COVUNI and its role in the project (dark blu denotes task or WP leadership, light blue denotes participation in a task).

	SATEAN		
Policy making	x	non-ICT	
Public administration			
Transportation			
Community management			
Communication	x		
Open data	x	ICT	
Gamification			
Cloud computing			
Mobile app dev.			
Algorithms			
Academia			
Not for profit	x		
Industrial			
Public administration			



Short CVs of key persons

- **Giorgio Guidi:** Project Leader. Senior Consultant in development cooperation and sustainable development. He works in collaboration with the University in projects concerning businesses support and with the University of Galati in activities focused on "social research and innovation" in the microcredit and microfinance field. He coordinated POSDRU projects in DMI 3.1a and 6.1 (micro-business start-ups and in the social Economy sector). Giorgio Guidi is currently collaborating in research activities and as expert with Fundatia Satean in a Leonardo - TOI project and in a HORIZON2020 project aiming to develop micro business in the south-est area of Romania through innovative plantations (quinoa).
- **Ionascu Eugen:** Technician. Micro-entrepreneurship, tutoring senior consultant & spin-offs and start-up business coach. Certified trainer in subjects regarding start-up, fund raising, microcredit and microfinance. Manager of the business support centre in the foundation of Bucarest born thanks to the strategic partnership project POSDRU 5.1 carried out with training institutions. Responsible of international and European relationships related to the innovative network created and supported by the Fundatia Satean to establish their position on the market and develop business relations in the other partner countries.
- **Denizia Lazar**: Administration. Expert on management and accounting for several EU projects.

Relevant previous projects or activities

Satean Fundation has a wide network of high quality partners in the field of experimentation, data collection and other activities of further steps of the project (Romanian Transport agencies, charity istitutions, CCIIAA) . Here follows a list of the skills Satean Fundation's staff has acquired during past participation in European Projects:

- "INVEST-INGREEN" Project - Lifelong Learning Programme, Transfer of Innovation (TOI): context analysis of innovative professional roles in the field of renewable energies and environment protection.
- "SPRED+C" Project - Lifelong Learning Programme, Multilateral Projects: Creating innovative tools and methods to include creativity and entrepreneurial culture in high schools and Universities
- "DIGIGUIDANCE" Project - Lifelong Learning Programme, Transfer of Innovation (TOI): creation of a web portal and an automated informative system for job orientation and skill assessment at the beginning and at the end of University and Specialization masters.
- "PROTEIN2FOOD" - Horizon 2020 - Sicurezza alimentare sostenibile: Experimentation and development in growing Quinoa seeds.

4.1.6 Buckinghamshire Advantage (BUCKADV)

(http://www.buckstvlep.co.uk/interesting-stuff/buckinghamshire-advantage)

Description of the legal entity

Bucks Advantage (BUCKSADV) is an not-for-profit urban development company which is jointly owned by the 5 municipalities in Buckinghamshire and Buckinghamshire Business First (the main business organisation in the county which sits at the heart of the golden triangle between Oxford, Cambridge and London). BUCKSADV is also the operational delivery arm of Buckinghamshire Thames Valley Local Enterprise Partnership (BTVLEP), which is one of 39 development agencies established by the UK government to drive economic growth in the UK.

BUCKSADV can trace it roots back to 2004, when its predecessor organisation, Aylesbury Vale Advantage (AVA), was formed as the local delivery vehicle for the Local Growth Area. Since its formation, in 2004, the organisation has delivered 667 homes (2004/05); 643 homes (2005/06); 616 homes (2006/07); 822 homes (2007/08); 744 homes (2008/09); 795 homes (2009/10); 755 homes (2010/11); and a range of public realm projects, infrastructure and employment sites.

Through its work with BTVLEP, BUCKSADV is responsible for overseeing the delivery of a £44m Capital Programme, which includes a number of major transport schemes; sustainable transport initiatives; and a spoke of a 5G Innovation Centre. Since 2014, one of its partners, Buckinghamshire County Council, has been developing a proof of concept for ONE-Transport, a Transportation 'big data' platform.

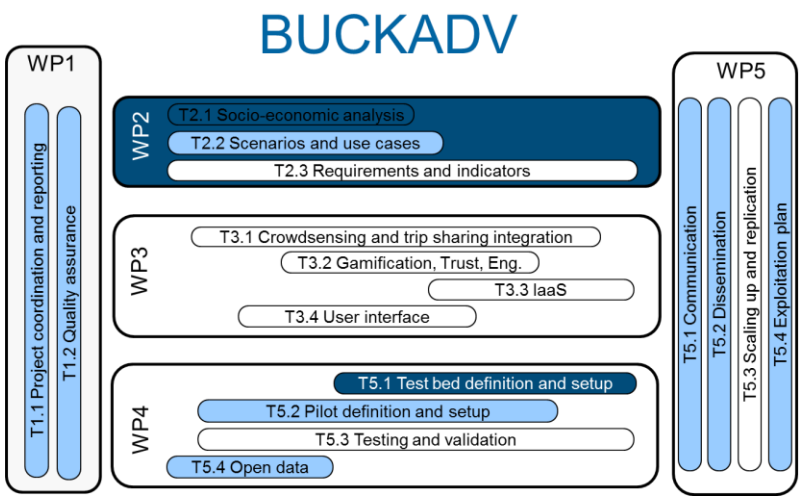
The last European projects in which the Buckinghamshire Advantage has been involved in is an Urbact Project, entitled USE-Act, which supported the development of a feasibility study for a big data platform for near market Paying for Eco-system Services (PES) opportunities. However, through its partner organisations, it has also acquired experience of working in a number of innovative 'Smart City' projects which have been supported by Structural Investment and European Community Funds.

Role in the project

BUCKSADV will bring its urban development and capital project/programme implementation expertise to this project, to developing a Test-Bed for piloting the innovative new applications developed through this project.

The following figure represents the main competences provided by BUCKSADV and its role in the project (dark blue denotes task or WP leadership, light blue denotes participation in a task).

	BUCKADV		
Policy making	x		non-ICT
Public administration	x		
Transportation	x		
Community management	x		
Communication	x		
Open data	x	ICT	
Gamification			
Cloud computing			
Mobile app dev.			
Algorithms			
Academia			
Not for profit	x		
Industrial			
Public administration			



Short CVs of key persons

- **Richard Harrington** - Richard Harrington is Chief Executive of Buckinghamshire Thames Valley LEP and Managing Director of Buckinghamshire Advantage. Prior to these roles he led a successful public private local delivery vehicle for eight years that translated planned employment, infrastructure and housing growth from the Sustainable Communities Plan into tangible outcomes on the ground. Before that Richard was Area Director for English Partnerships with responsibility for the East of England, Northamptonshire and Aylesbury Vale. Richard is a Chartered Town Planner and Chartered Surveyor specialising in public private delivery. Over the past ten years he has taken a leading role in establishing and running a number of local delivery companies. Most recently this activity has involved establishing an innovative public private property investment fund, large scale employment promotion, town centre renewal, securing planning consent and land for major development areas, procuring infrastructure, from parkway railway stations to electricity supply capacity, to service new growth areas and working alongside development consortiums to help secure planning consent and accelerate the rate of delivery.
- **Paul McKim** – Paul McKim is a Project Manager at Buckinghamshire Advantage. He possesses a Bachelor of Town Planning, MSc in Construction Project Management and is a Member of Royal Town Planning Institute. His past track record includes Assistant Project Sponsor for the Olympic Delivery Authority reporting to Director of Planning and Design, responsible for the Olympic Park planning application, master-plan, access and design statements, community consultation and related project interfaces, with stadiums, roads and bridges and River Lea Park Authority; Joint author and project manager for Leicestershire local authorities' independent economic review of the 15,000 unit Pennbury Eco Town; Planning Manager for the Milton Keynes Oxley Park development including zero carbon development proposals; Portfolio Manager and Planning Manager for establishing London Wide Affordable Homes Initiative on public sector land surplus to requirements; Programme Manager for Charnwood Borough Council's Local Plan by establishing internal and external delivery structures for major housing extensions, infrastructure delivery corporate risk management and assurance processes; Project and Procurement Manager for the multi disciplinary project team for the delivery of work schedule and delivery of Aylesbury South East Strategic Regeneration Area; and Project and Programme Manager for all the planning, master-planning and planning processes for Northstowe New Town in South Cambridgeshire and English Partnerships stakeholder relationships with statutory agencies, local authorities and sponsor departments.
- **Jim Sims** - Jim Sims is a Development Manager at BTVLEP/Buckinghamshire Advantage. Jim joined the company in 2013 to help oversee the development and delivery of various

strategic projects. Prior to this assignment, Jim was the Head of Innovation, Sector Development and Funding at Buckinghamshire Business First. Through this work he has gained a wealth of experience of designing and delivering a range of innovative business support and economic development projects. Jim has also had a stint as a General Manager of a private sector training company, prior to which he gained a degree in Industrial Design and a Chartered Institute of Marketing Diploma. Jim is also an Alumni of Cranfield School of Management, a member of the Institute of Economic Development and a qualified PRINCE2 practitioner.

Relevant publications, and/or products, services

1. J.Sims authored the project application for 'Innovative composite end effectors for handling lightweight, flexible elastomers' http://gtr.rcuk.ac.uk/project/4740667F-3B9A-4B82-A806-BF68F5392B79
2. J. Sims authored the LLP project application for the Science for Prevention Academic Network http://www.span-europe.eu/
3. J. Sims authored the project application for 'SAFEDON Automation - Glove Packaging Machinery' http://gtr.rcuk.ac.uk/project/42B897F5-49D0-4809-9158-C780BEAA7F93

Relevant previous projects or activities

- OneTRANSPORT - OneM2M-based open ecosystem for transport modal shift - T S Gammons, Arup, UK, A Carlton, InterDigital Europe Ltd, UK, D Trousdale, Buckinghamshire County Council, UK

4.1.7 Regione Abruzzo (ABR) (www.regione.abruzzo.it)

Description of the legal entity

ABR stands for Region Abruzzo, the political and administrative government of the region thathas competences in several domains. Its Departments concern sectors such as civil services, youth policy, cultural heritage, social policies together with territorial authorities and institutions, immigration, social cooperation, territorial planning, environmental protection and public health, tourism, natural risks. The regional structure that will implement the project activities will be the Direzione Regionale Trasporti e Mobilità. This office will cooperate with all territorial institutions in charge of environment protection and related EU Directives application.

Abruzzo Region is geographically placed in Central-Eastern Italy, and is composed by 4 provinces and 305 municipalities. The Department of Transport, Infrastructure, Mobility and Logistics by its Road Infrastructure, Intermodality and Logistics Service and Port and Airport Office is in charge to develop and manage the Regional strategy on transports focused on Traffic and road safety, Planning and organizing transport, transport infrastructure and nodal intermodal transportation regional rail systems, local public transport, management control and tariff policy. Human Resources: 2000 employees, provisional buget 2013: 6 mld and 532 mln euro.

The Department acquired specific competence in the field through: - The development and implementation of the Integrated Regional Transport Plan (PRIT) and the Local Public Transport (LPT) and its annual updates and deletions; - the coordination of the regional plan for the system of logistics and of all plans related to the regional road system;- Training programs, proposals, plans and guidelines related to the total investments decided by the Region Government in the transportation sector The amelioration of the public transportation system is one of the main tools for supporting a sustainable development. In this sense, due to its institutional tasks and duties, the regional department in charge of planning and managing the regional transports, is the body better entitled to influence and propose regional and local policies able to affect and reduce the problems afforded by the project.

Although small, Abruzzo region is one of the most industrialized regions in Italy (especially considering automotive industry, with an huge rate of FDI related to innovative automotive solutions – i.e. Honda; Toyota) and it is considered a region of excellence, not only for its economic performance, but also for its cultural, natural and social richness.. Its model of development is based on clusters of big enterprises surrounded a myriad of small and medium-sized enterprises (SMEs)

Role in the project

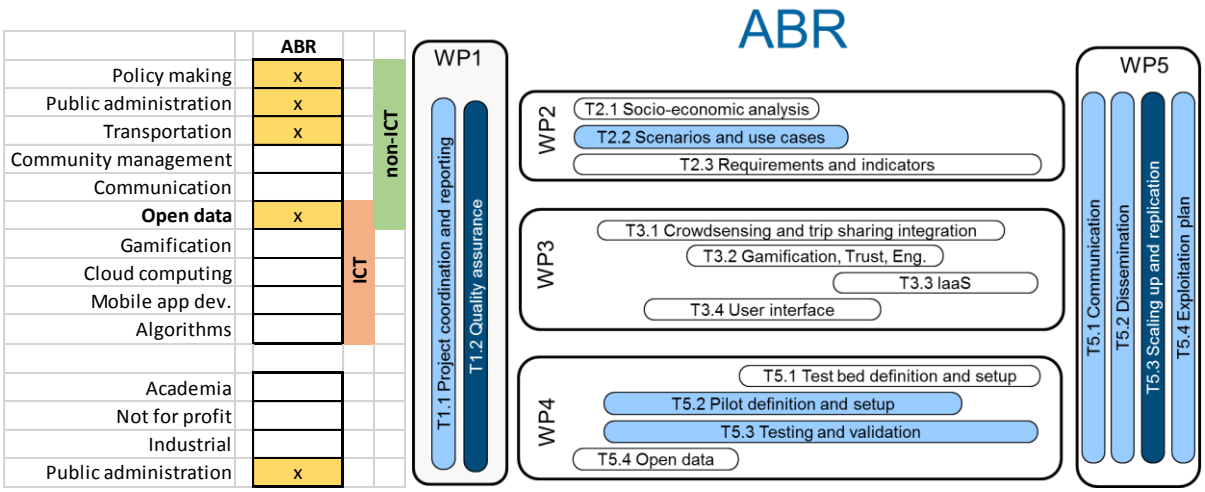
ABR contributes to the project mainly in two ways:

- involving local Public Administrations and companies of the local public transportation system (organized into 5 consortia that are managing together more than 1.300 buses) in the testing and the starting up of a distributed and participated detection system. In particular bus drivers will become detectors in order to build a permanent monitoring system on the decay rate of the quality of roads and mapped routes over time.
- reusing available Open Data for policy making and planning, transforming information and calculating KPIs, dependent on the state of the regional roads, for institutional purposes (in particular the commercial speed of public transport fleets).

Like Marche Region, ABR is also interested in experimenting and exploring the project results using the proposed approach and prototype for the future development of its territory. At the same time project results could contribute to the definition of a national and international approach focusing on interregional partnerships, e.g. the “Italia Mediana” agreement between the 5 Regions

of central Italy (DGR n. 203/2015) to collaborate in the 2014-2020 programming period on the subjects of the local Digital Agendas; or the Adriatic Ionian macro region initiatives under the pillar II – connecting the macro-area.
Moreover ABR has a specific public and collective interest in the themes related to local roads management, regional road transport development policies, updating of the cadastre of provincial roads, city planning, road safety and maintenance, efficiency of public investments in the construction sector, car sharing, Co2 emission reduction and so on.

The following figure represents the main competences provided by ABR and its role in the project (dark blu denotes task or WP leadership, light blue denotes participation in a task).



Short CVs of key persons

- **Dr. Giancarlo ZAPPACOSTA (M)** is the executive director of the transport and Mobility department in the Abruzzo Region. He is an expert of e-government processes and innovation in Public Administration, with focus on the provision of mobility solutions to citizens and businesses. She is also a member of numerous regional and national working groups concerning smart mobility solutions.
- **Dr. Ester DI CINO (F)** is the chief technical professional of the regional Department. She received her degree in Laws. She is the officer in charge for the telematic regional plan for transports. She has a supporting role in the design of the regional architectural system used in the experimentation, in the revision and the implementation of the technical contents and in the coordination of the activities involving the use of regional instruments, infrastructures and systems.
- **Prof. Germana DI FALCO (F)** is professor of Public Policy and Participatory Planning and supports the use of Big and Open Data as a tool for crowd-monitoring, crowd-evaluationand crowd-sourcing in policy making. She coordinates several EU projects and is in charge of URBACT Training Schemes, involving more than 400 cities all around Europe that will be invited in joining the pilots and compare solutions and results.
- **Mr. Giuseppe SCIACCHITANO (M)** is a senior ICT technician. He is expert in open source technologies and in the advanced use of mobile devices and smart phones. He will support the communication and dissemination activities and the effective running of the regional experimentation. He will operate as help desk technicians and in supporting the coordination of the activities of the territorial end-users.

Relevant previous projects or activities

CROWD4ROADS

- Abruzzo Region has been lead-partner and partner in the projects: NPPA Interreg; CARDS-Phare, Project MAP – Multimodal Adriatic Ports; The Sea Bridge project. All mainly related to the development and improvement of networks of transport by sea connecting the Abruzzo Region to the most important pan-European networks.
- Specific projects and activities related to the transport sector, mostly European, such as **TASMAC** (Tourism Accessibility in SMall Attractive Cities), **TWIST** (demand responsive Transport WIth a Social Target, in mountain and rural areas), **AUTO INSIEME** (car pooling).
- "Interreg IIIB CADSES : 1) Development of A Sustainable Tourism 2) TWIST, 3) ESTIA ESPOSE Interreg IIIC : 1) E-PRODAT, 2) REGENERGY, Interreg IIIA : 1) Rivernet, 2) Wood - Art, 3) Enerwood, 4) Mem, 5) Adripentur, 6) Cifiv, 7) Adri - Europe, 8) Adri - Blood Interreg IVC: 1) Preserve, 2) ESF6CIA, 3) More4nrg. Furthermore several projects within.LLP: 01-ITA01-SG01-00002-1,02-ITA01-SG01-0068-1,04-ITA01-S2G01-00186,100396-CP-1-MT and 101294-CP-1-2002-1-FR Culture 0399 001 ,and SEC VA A1 I-23 Socrates 112745-AM-1-2003-1-DE-ACC-MEAS-CMC and 2005 08900 001 002 SO2B-81AWC, LdV, Art.6 of ESF.
- The region is the main national body managing Structural Funds (ESFR, ESF, Cooperation) through its ROPs.
- Other projects were Other projects have been presented within Interreg IVC, IPA Adriatic, EU Transport and Mobility ,Call Move/sub/01-2010

4.2. Third parties involved in the project (including use of third party resources)

Third parties will be involved in the project by two of the participants, namely, MAR and BUCKADV. The corresponding tables are provided below:

4.2.1 UNIURB

No third parties involved.

4.2.2 MAR

Does the participant plan to subcontract certain tasks (please note that core tasks of the action should not be sub-contracted)	Y
Technical assistance for administrative and financial management between Marche Region and Lattanzio Advisory Spa, following Regional Decree n.211/POC of 18/12/2013 about public tender procedure according to Italian National Law D. LGS. n. 163/2006. Contract n° 1271 signed on 15/09/2014).	
Does the participant envisage that part of its work is performed by linked third parties[1]	N
Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Grant Agreement)	N

4.2.3 COMUTO

No third parties involved.

4.2.4 COVUNI

No third parties involved.

4.2.5 SATEAN

[1] A third party that is an affiliated entity or has a legal link to a participant implying a collaboration not limited to the action (Article 14 of the Model Grant Agreement).

No third parties involved.

4.2.6 BUCKADV

Does the participant plan to subcontract certain tasks (please note that core tasks of the action should not be sub-contracted)	N
Does the participant envisage that part of its work is performed by linked third parties[2]	Y
BUCKADV is a modern, agile, partnership-based, quasi-public-sector organisation that has taken a conscious decision to maintain a small core team in order to be able to flex according to the needs and demands of an increasingly changing public sector environment. We have adopted this approach to enable us to develop and rapidly scale innovative, new business/financial models for smart infrastructure solutions, rather than be held back by an outdated employee base. To that end, we have developed relationships with a number of linked third parties to provide us with the specialist Transportation and M2M expertise we need to deliver such projects. As far as this project is concerned, we intend using Interdigital and Buckinghamshire County Council as linked third parties, to provide us with the above support.	
Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Grant Agreement)	N

4.2.7 ABR

No third parties involved.

[2] A third party that is an affiliated entity or has a legal link to a participant implying a collaboration not limited to the action (Article 14 of the Model Grant Agreement).

Section 5: Ethics and security

5.1 Ethics

If you have entered any ethics issues in the ethical issue table in the administrative proposal forms, you must:

- submit an ethics self-assessment, which:
    - describes how the proposal meets the national legal and ethical requirements of the country or countries where the tasks raising ethical issues are to be carried out;
    - explains in detail how you intend to address the issues in the ethical issues table, in particular as regards:
        - research objectives (e.g. study of vulnerable populations, dual use, etc.);
        - research methodology (e.g. clinical trials, involvement of children and related consent procedures, protection of any data collected, etc.);
        - the potential impact of the research (e.g. dual use issues, environmental damage, stigmatisation of particular social groups, political or financial retaliation, benefit-sharing, malevolent use, etc.).
- provide the documents that you need under national law (if you already have them), e.g.:
    - an ethics committee opinion;
    - the document notifying activities raising ethical issues or authorising such activities.

5.2 Security[3]

Please indicate if your project will involve:

- activities or results raising security issues: NO
- 'EU-classified information' as background or results: NO

[3] Article 37.1 of the Model Grant Agreement: *Before disclosing results of activities raising security issues to a third party (including affiliated entities), a beneficiary must inform the coordinator — which must request written approval from the Commission/Agency.* Article 37.2: *Activities related to 'classified deliverables' must comply with the 'security requirements' until they are declassified. Action tasks related to classified deliverables may not be subcontracted without prior explicit written approval from the Commission/Agency. The beneficiaries must inform the coordinator — which must immediately inform the Commission/Agency — of any changes in the security context and — if necessary —request for Annex 1 to be amended (see Article 55).*

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