EUROPEAN COMMISSION
Research Executive Agency

Director

GRANT AGREEMENT

NUMBER — 769608 — PoliVisu

This **Agreement** ('the Agreement') is **between** the following parties:

on the one part,

the **Research Executive Agency (REA)** ('the Agency'), under the powers delegated by the European Commission ('the Commission'), represented for the purposes of signature of this Agreement by Head of Unit , Research Executive Agency , Industrial Leadership and Societal Challenges Department, Inclusive, Innovative and Reflective Societies, Corinna AMTING,

and

on the other part,

1. 'the coordinator':

VLAAMS GEWEST (AIV), established in KONING ALBERT II LAAN 20, BRUSSEL 1000, Belgium, represented for the purposes of signing the Agreement by projectleider, Geert MAREELS

and the following other beneficiaries, if they sign their 'Accession Form' (see Annex 3 and Article 56):

2. **IS-practice (ISP)**, established in Renkinstraat 71, Schaarbeek 1030, Belgium, VAT number: BE0478042526,

3. **EDIP SRO (EDIP)**, established in PARIZSKA 1230/1, PLZEN 301 00, Czech Republic, VAT number: CZ25462482,

4. **SOCIETE D'ECONOMIE MIXTE ISSY - MEDIA (SEM ISSY MEDIA) (ISSY)**, established in RUE DU GENERAL LECLERC 62, ISSY LES MOULINEAUX 92130, France,

5. **HELP SERVICE REMOTE SENSING SRO (HSRS)**, established in HUSOVA 2117, BENESOV 256 01, Czech Republic, VAT number: CZ48582611,

6. **GEOSPARC NV (GEOS)**, established in BRUGSESTEENWEG 587, GENT 9030, Belgium, VAT number: BE0808353458,

7. **INNOCONNECT SRO (INCO)**, established in FIALKOVA 1026/16, CERNICE, PLZEN 326 00, Czech Republic, VAT number: CZ05468841,

8. **CITY ZEN DATA (CZD)**, established in 55 rue Charles Nungesser, Guipavas 29490, France, VAT number: FR56792556201,

9. **21C CONSULTANCY LIMITED (21C)**, established in THE WORK PLACE, LADBROKE GROVE 105, LONDON W11 1PG, United Kingdom,

10. **ATHENS TECHNOLOGY CENTER SA (ATC)**, established in RIZAREIOU 10, ATHINA 15233, Greece, VAT number: EL094360380,

11. **SPRAVA INFORMACNICH TECHNOLOGII MESTA PLZNE, PRISPEVKOVA ORGANIZACE (SITMP)**, established in DOMINIKANSKA 4, PLZEN 301 00, Czech Republic, VAT number: CZ66362717,

12. **MACQ SA (MACQ)**, established in RUE DE L AERONEF 2, BRUXELLES 1140, Belgium,

13. **PLAN4ALL ZS (P4A)**, established in K RYBNICKU 557, HORNI BRIZA 330 12, Czech Republic,

14. **POLITECNICO DI MILANO (POLIMI)**, established in PIAZZA LEONARDO DA VINCI 32, MILANO 20133, Italy, VAT number: IT04376620151,

15. **STAD GENT (GENT)**, established in BOTERMARKT 1, GENT 9000, Belgium, VAT number: N/A,

Unless otherwise specified, references to ‘beneficiary’ or ‘beneficiaries’ include the coordinator.

The parties referred to above have agreed to enter into the Agreement under the terms and conditions below.

By signing the Agreement or the Accession Form, the beneficiaries accept the grant and agree to implement it under their own responsibility and in accordance with the Agreement, with all the obligations and conditions it sets out.

The Agreement is composed of:

Terms and Conditions

Annex 1 Description of the action

Annex 2 Estimated budget for the action

2a Additional information on the estimated budget

Annex 3 Accession Forms

Annex 4 Model for the financial statements

Annex 5 Model for the certificate on the financial statements (CFS)

Annex 6 Model for the certificate on the methodology

TERMS AND CONDITIONS

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CHAPTER 1 GENERAL

ARTICLE 1 — SUBJECT OF THE AGREEMENT

This Agreement sets out the rights and obligations and the terms and conditions applicable to the grant awarded to the beneficiaries for implementing the action set out in Chapter 2.

CHAPTER 2 ACTION

ARTICLE 2 — ACTION TO BE IMPLEMENTED

The grant is awarded for the action entitled '**Policy Development based on Advanced Geospatial Data Analytics and Visualisation — PoliVisu**' **('action')**, as described in Annex 1.

ARTICLE 3 — DURATION AND STARTING DATE OF THE ACTION

The duration of the action will be **36 months** as of 1 November 2017 ('**starting date of the action**').

ARTICLE 4 — ESTIMATED BUDGET AND BUDGET TRANSFERS

4.1 Estimated budget

The '**estimated budget**' for the action is set out in Annex 2.

It contains the estimated eligible costs and the forms of costs, broken down by beneficiary (and linked third party) and budget category (see Articles 5, 6, and 14).

4.2 Budget transfers

The estimated budget breakdown indicated in Annex 2 may be adjusted — without an amendment (see Article 55) — by transfers of amounts between beneficiaries, budget categories and/or forms of costs set out in Annex 2, if the action is implemented as described in Annex 1.

However, the beneficiaries may not add costs relating to subcontracts not provided for in Annex 1, unless such additional subcontracts are approved by an amendment or in accordance with Article 13.

CHAPTER 3 GRANT

ARTICLE 5 — GRANT AMOUNT, FORM OF GRANT, REIMBURSEMENT RATES AND FORMS OF COSTS

5.1 Maximum grant amount

The '**maximum grant amount**' is **EUR 3,907,700.00** (three million nine hundred and seven thousand seven hundred EURO).

5.2 Form of grant, reimbursement rates and forms of costs

The grant reimburses **100% of the action's eligible costs** (see Article 6) ('**reimbursement of eligible costs grant**') (see Annex 2).

The estimated eligible costs of the action are EUR **3,907,700.00** (three million nine hundred and seven thousand seven hundred EURO).

Eligible costs (see Article 6) must be declared under the following forms ('**forms of costs**'):

(a) for **direct personnel costs**:

- as actually incurred costs ('**actual costs**') or
- on the basis of an amount per unit calculated by the beneficiary in accordance with its usual cost accounting practices ('**unit costs**').

Personnel **costs for SME owners** or **beneficiaries that are natural persons** not receiving a salary (see Article 6.2, Points A.4 and A.5) must be declared on the basis of the amount per unit set out in Annex 2a (**unit costs**);

(b) for **direct costs for subcontracting**: as actually incurred costs (**actual costs**);

(c) for **direct costs of providing financial support to third parties**: not applicable;

(d) for **other direct costs**: as actually incurred costs (**actual costs**);

(e) for **indirect costs**: on the basis of a flat-rate applied as set out in Article 6.2, Point E ('**flat-rate costs**');

(f) **specific cost category(ies):** not applicable.

5.3 Final grant amount — Calculation

The '**final grant amount**' depends on the actual extent to which the action is implemented in accordance with the Agreement's terms and conditions.

This amount is calculated by the Agency — when the payment of the balance is made (see Article 21.4) — in the following steps:

Step 1 – Application of the reimbursement rates to the eligible costs

Step 2 – Limit to the maximum grant amount

Step 3 – Reduction due to the no-profit rule

Step 4 – Reduction due to substantial errors, irregularities or fraud or serious breach of obligations

5.3.1 Step 1 — Application of the reimbursement rates to the eligible costs

The reimbursement rate(s) (see Article 5.2) are applied to the eligible costs (actual costs, unit costs and flat-rate costs; see Article 6) declared by the beneficiaries and linked third parties (see Article 20) and approved by the Agency (see Article 21).

5.3.2 Step 2 — Limit to the maximum grant amount

If the amount obtained following Step 1 is higher than the maximum grant amount set out in Article 5.1, it will be limited to the latter.

5.3.3 Step 3 — Reduction due to the no-profit rule

The grant must not produce a profit.

'**Profit**' means the surplus of the amount obtained following Steps 1 and 2 plus the action's total receipts, over the action's total eligible costs.

The '**action's total eligible costs**' are the consolidated total eligible costs approved by the Agency.

The '**action's total receipts**' are the consolidated total receipts generated during its duration (see Article 3).

The following are considered **receipts**:

(a) income generated by the action; if the income is generated from selling equipment or other assets purchased under the Agreement, the receipt is up to the amount declared as eligible under the Agreement;

(b) financial contributions given by third parties to the beneficiary or to a linked third party specifically to be used for the action, and

(c) in-kind contributions provided by third parties free of charge and specifically to be used for the action, if they have been declared as eligible costs.

The following are however not considered receipts:

(a) income generated by exploiting the action's results (see Article 28);

(b) financial contributions by third parties, if they may be used to cover costs other than the eligible costs (see Article 6);

(c) financial contributions by third parties with no obligation to repay any amount unused at the end of the period set out in Article 3.

If there is a profit, it will be deducted from the amount obtained following Steps 1 and 2.

5.3.4 Step 4 — Reduction due to substantial errors, irregularities or fraud or serious breach of obligations — Reduced grant amount — Calculation

If the grant is reduced (see Article 43), the Agency will calculate the reduced grant amount by deducting the amount of the reduction (calculated in proportion to the seriousness of the errors, irregularities or fraud or breach of obligations, in accordance with Article 43.2) from the maximum grant amount set out in Article 5.1.

The final grant amount will be the lower of the following two:

- the amount obtained following Steps 1 to 3 or
- the reduced grant amount following Step 4.

5.4 Revised final grant amount — Calculation

If — after the payment of the balance (in particular, after checks, reviews, audits or investigations; see Article 22) — the Agency rejects costs (see Article 42) or reduces the grant (see Article 43), it will calculate the '**revised final grant amount**' for the beneficiary concerned by the findings.

This amount is calculated by the Agency on the basis of the findings, as follows:

- in case of **rejection of costs**: by applying the reimbursement rate to the revised eligible costs approved by the Agency for the beneficiary concerned;

- in case of **reduction of the grant**: by calculating the concerned beneficiary's share in the grant amount reduced in proportion to the seriousness of the errors, irregularities or fraud or breach of obligations (see Article 43.2).

In case of **rejection of costs and reduction of the grant**, the revised final grant amount for the beneficiary concerned will be the lower of the two amounts above.

ARTICLE 6 — ELIGIBLE AND INELIGIBLE COSTS

6.1 General conditions for costs to be eligible

'**Eligible costs**' are costs that meet the following criteria:

(a) for **actual costs**:

(i) they must be actually incurred by the beneficiary;

(ii) they must be incurred in the period set out in Article 3, with the exception of costs relating to the submission of the periodic report for the last reporting period and the final report (see Article 20);

(iii) they must be indicated in the estimated budget set out in Annex 2;

(iv) they must be incurred in connection with the action as described in Annex 1 and necessary for its implementation;

(v) they must be identifiable and verifiable, in particular recorded in the beneficiary's accounts in accordance with the accounting standards applicable in the country where the beneficiary is established and with the beneficiary's usual cost accounting practices;

(vi) they must comply with the applicable national law on taxes, labour and social security, and

(vii) they must be reasonable, justified and must comply with the principle of sound financial management, in particular regarding economy and efficiency;

(b) for **unit costs**:

(i) they must be calculated as follows:

{amounts per unit set out in Annex 2a or calculated by the beneficiary in accordance with its usual cost accounting practices (see Article 6.2, Point A)

multiplied by

the number of actual units};

(ii) the number of actual units must comply with the following conditions:

- the units must be actually used or produced in the period set out in Article 3;
- the units must be necessary for implementing the action or produced by it, and
- the number of units must be identifiable and verifiable, in particular supported by records and documentation (see Article 18);

(c) for **flat-rate costs**:

(i) they must be calculated by applying the flat-rate set out in Annex 2, and

(ii) the costs (actual costs or unit costs) to which the flat-rate is applied must comply with the conditions for eligibility set out in this Article.

6.2 Specific conditions for costs to be eligible

Costs are eligible if they comply with the general conditions (see above) and the specific conditions set out below for each of the following budget categories:

A. direct personnel costs;
B. direct costs of subcontracting;
C. not applicable;
D. other direct costs;
E. indirect costs;
F. not applicable.

'Direct costs' are costs that are directly linked to the action implementation and can therefore be attributed to it directly. They must not include any indirect costs (see Point E below).

'Indirect costs' are costs that are not directly linked to the action implementation and therefore cannot be attributed directly to it.

A. Direct personnel costs

Types of eligible personnel costs

A.1 Personnel costs are eligible, if they are related to personnel working for the beneficiary under an employment contract (or equivalent appointing act) and assigned to the action ('**costs for employees (or equivalent)**'). They must be limited to salaries (including during parental leave), social security contributions, taxes and other costs included in the **remuneration**, if they arise from national law or the employment contract (or equivalent appointing act).

Beneficiaries that are non-profit legal entities [1] may also declare as personnel costs **additional remuneration** for personnel assigned to the action (including payments on the basis of supplementary contracts regardless of their nature), if:

(a) it is part of the beneficiary's usual remuneration practices and is paid in a consistent manner whenever the same kind of work or expertise is required;

(b) the criteria used to calculate the supplementary payments are objective and generally applied by the beneficiary, regardless of the source of funding used.

Additional remuneration for personnel assigned to the action is eligible up to the following amount:

(a) if the person works full time and exclusively on the action during the full year: up to EUR 8 000;

(b) if the person works exclusively on the action but not full-time or not for the full year: up to the corresponding pro-rata amount of EUR 8 000, or

(c) if the person does not work exclusively on the action: up to a pro-rata amount calculated as follows:

{{EUR 8 000

divided by

the number of annual productive hours (see below)},

multiplied by

the number of hours that the person has worked on the action during the year}.

A.2 The **costs for natural persons working under a direct contract** with the beneficiary other than an employment contract are eligible personnel costs, if:

(a) the person works under the beneficiary's instructions and, unless otherwise agreed with the beneficiary, on the beneficiary's premises;

(b) the result of the work carried out belongs to the beneficiary, and

(c) the costs are not significantly different from those for personnel performing similar tasks under an employment contract with the beneficiary.

A.3 The **costs of personnel seconded by a third party against payment** are eligible personnel costs, if the conditions in Article 11.1 are met.

A.4 **Costs of owners** of beneficiaries that are small and medium-sized enterprises ('**SME owners**') who are working on the action and who do not receive a salary are eligible personnel costs, if they correspond to the amount per unit set out in Annex 2a multiplied by the number of actual hours worked on the action.

A.5 **Costs of 'beneficiaries that are natural persons'** not receiving a salary are eligible personnel costs, if they correspond to the amount per unit set out in Annex 2a multiplied by the number of actual hours worked on the action.

Calculation

[1] For the definition, see Article 2.1(14) of the Rules for Participation Regulation No 1290/2013: '**non-profit legal entity**' means a legal entity which by its legal form is non-profit-making or which has a legal or statutory obligation not to distribute profits to its shareholders or individual members.

Personnel costs must be calculated by the beneficiaries as follows:

{{hourly rate

multiplied by

the number of actual hours worked on the action},

plus

for non-profit legal entities: additional remuneration to personnel assigned to the action under the conditions set out above (Point A.1)}.

The number of actual hours declared for a person must be identifiable and verifiable (see Article 18).

The total number of hours declared in EU or Euratom grants, for a person for a year, cannot be higher than the annual productive hours used for the calculations of the hourly rate. Therefore, the maximum number of hours that can be declared for the grant is:

{the number of annual productive hours for the year (see below)

minus

total number of hours declared by the beneficiary for that person in that year for other EU or Euratom grants}.

The '**hourly rate**' is one of the following:

(a) for personnel costs declared as **actual costs:** the hourly rate is calculated *per full financial year*, as follows:

{actual annual personnel costs (excluding additional remuneration) for the person

divided by

number of annual productive hours}.

using the personnel costs and the number of productive hours for each full financial year covered by the reporting period concerned. If a financial year is not closed at the end of the reporting period, the beneficiaries must use the hourly rate of the last closed financial year available.

For the 'number of annual productive hours', the beneficiaries may choose one of the following:

(i) 'fixed number of hours': 1 720 hours for persons working full time (or corresponding pro-rata for persons not working full time);

(ii) 'individual annual productive hours': the total number of hours worked by the person in the year for the beneficiary, calculated as follows:

{annual workable hours of the person (according to the employment contract, applicable collective labour agreement or national law)

plus

overtime worked

minus

absences (such as sick leave and special leave)}.

'Annual workable hours' means the period during which the personnel must be working, at the employer's disposal and carrying out his/her activity or duties under the employment contract, applicable collective labour agreement or national working time legislation.

If the contract (or applicable collective labour agreement or national working time legislation) does not allow to determine the annual workable hours, this option cannot be used;

(iii) 'standard annual productive hours': the 'standard number of annual hours' generally applied by the beneficiary for its personnel in accordance with its usual cost accounting practices. This number must be at least 90% of the 'standard annual workable hours'.

If there is no applicable reference for the standard annual workable hours, this option cannot be used.

For all options, the actual time spent on **parental leave** by a person assigned to the action may be deducted from the number of annual productive hours.

As an alternative, beneficiaries may calculate the hourly rate *per month*, as follows:

{actual monthly personnel cost (excluding additional remuneration) for the person

divided by

{number of annual productive hours / 12}}

using the personnel costs for each month and (one twelfth of) the annual productive hours calculated according to either option (i) or (iii) above, i.e.:

- fixed number of hours or
- standard annual productive hours.

Time spent on **parental leave** may not be deducted when calculating the hourly rate per month. However, beneficiaries may declare personnel costs incurred in periods of parental leave in proportion to the time the person worked on the action in that financial year.

If parts of a basic remuneration are generated over a period longer than a month, the beneficiaries may include only the share which is generated in the month (irrespective of the amount actually paid for that month).

Each beneficiary must use only one option (per full financial year or per month) for each full financial year;

(b) for personnel costs declared on the basis of **unit costs**: the hourly rate is one of the following:

(i) for SME owners or beneficiaries that are natural persons: the hourly rate set out in Annex 2a (see Points A.4 and A.5 above), or

(ii) for personnel costs declared on the basis of the beneficiary's usual cost accounting practices: the hourly rate calculated by the beneficiary in accordance with its usual cost accounting practices, if:

- the cost accounting practices used are applied in a consistent manner, based on objective criteria, regardless of the source of funding;

- the hourly rate is calculated using the actual personnel costs recorded in the beneficiary's accounts, excluding any ineligible cost or costs included in other budget categories.

  The actual personnel costs may be adjusted by the beneficiary on the basis of budgeted or estimated elements. Those elements must be relevant for calculating the personnel costs, reasonable and correspond to objective and verifiable information;

and

- the hourly rate is calculated using the number of annual productive hours (see above).

B. Direct costs of subcontracting (including related duties, taxes and charges such as non-deductible value added tax (VAT) paid by the beneficiary) are eligible if the conditions in Article 13.1.1 are met.

C. Direct costs of providing financial support to third parties

Not applicable

D. Other direct costs

D.1 **Travel costs and related subsistence allowances** (including related duties, taxes and charges such as non-deductible value added tax (VAT) paid by the beneficiary) are eligible if they are in line with the beneficiary's usual practices on travel.

D.2 The **depreciation costs of equipment, infrastructure or other assets** (new or second-hand) as recorded in the beneficiary's accounts are eligible, if they were purchased in accordance with Article 10.1.1 and written off in accordance with international accounting standards and the beneficiary's usual accounting practices.

The **costs of renting or leasing** equipment, infrastructure or other assets (including related duties, taxes and charges such as non-deductible value added tax (VAT) paid by the beneficiary) are also eligible, if they do not exceed the depreciation costs of similar equipment, infrastructure or assets and do not include any financing fees.

The costs of equipment, infrastructure or other assets **contributed in-kind against payment** are eligible, if they do not exceed the depreciation costs of similar equipment, infrastructure or assets, do not include any financing fees and if the conditions in Article 11.1 are met.

The only portion of the costs that will be taken into account is that which corresponds to the duration of the action and rate of actual use for the purposes of the action.

D.3 **Costs of other goods and services** (including related duties, taxes and charges such as non-deductible value added tax (VAT) paid by the beneficiary) are eligible, if they are:

(a) purchased specifically for the action and in accordance with Article 10.1.1 or

(b) contributed in kind against payment and in accordance with Article 11.1.

Such goods and services include, for instance, consumables and supplies, dissemination (including open access), protection of results, certificates on the financial statements (if they are required by the Agreement), certificates on the methodology, translations and publications.

D.4 **Capitalised and operating costs of 'large research infrastructure'**[2] directly used for the action are eligible, if:

(a) the value of the large research infrastructure represents at least 75% of the total fixed assets (at historical value in its last closed balance sheet before the date of the signature of the Agreement or as determined on the basis of the rental and leasing costs of the research infrastructure[3]);

(b) the beneficiary's methodology for declaring the costs for large research infrastructure has been positively assessed by the Commission ('**ex-ante assessment**');

(c) the beneficiary declares as direct eligible costs only the portion which corresponds to the duration of the action and the rate of actual use for the purposes of the action, and

(d) they comply with the conditions as further detailed in the annotations to the H2020 grant agreements.

E. Indirect costs

Indirect costs are eligible if they are declared on the basis of the flat-rate of 25% of the eligible direct costs (see Article 5.2 and Points A to D above), from which are excluded:

(a) costs of subcontracting and

(b) costs of in-kind contributions provided by third parties which are not used on the beneficiary's premises;

(c) not applicable;

(d) not applicable.

[2] '**Large research infrastructure**' means research infrastructure of a total value of at least EUR 20 million, for a beneficiary, calculated as the sum of historical asset values of each individual research infrastructure of that beneficiary, as they appear in its last closed balance sheet before the date of the signature of the Agreement or as determined on the basis of the rental and leasing costs of the research infrastructure.

[3] For the definition, see Article 2(6) of the H2020 Framework Programme Regulation No 1291/2013: '**Research infrastructure**' are facilities, resources and services that are used by the research communities to conduct research and foster innovation in their fields. Where relevant, they may be used beyond research, e.g. for education or public services. They include: major scientific equipment (or sets of instruments); knowledge-based resources such as collections, archives or scientific data; e-infrastructures such as data and computing systems and communication networks; and any other infrastructure of a unique nature essential to achieve excellence in research and innovation. Such infrastructures may be 'single-sited', 'virtual' or 'distributed'.

Beneficiaries receiving an operating grant [4] financed by the EU or Euratom budget cannot declare indirect costs for the period covered by the operating grant.

F. Specific cost category(ies)

Not applicable

6.3 Conditions for costs of linked third parties to be eligible

Costs incurred by linked third parties are eligible if they fulfil — mutatis mutandis — the general and specific conditions for eligibility set out in this Article (Article 6.1 and 6.2) and Article 14.1.1.

6.4 Conditions for in-kind contributions provided by third parties free of charge to be eligible

In-kind contributions provided free of charge are eligible direct costs (for the beneficiary or linked third party), if the costs incurred by the third party fulfil — *mutatis mutandis* — the general and specific conditions for eligibility set out in this Article (Article 6.1 and 6.2) and Article 12.1.

6.5 Ineligible costs

'**Ineligible costs**' are:

(a) costs that do not comply with the conditions set out above (Article 6.1 to 6.4), in particular:

(i) costs related to return on capital;

(ii) debt and debt service charges;

(iii) provisions for future losses or debts;

(iv) interest owed;

(v) doubtful debts;

(vi) currency exchange losses;

(vii) bank costs charged by the beneficiary's bank for transfers from the Agency;

(viii) excessive or reckless expenditure;

(ix) deductible VAT;

(x) costs incurred during suspension of the implementation of the action (see Article 49);

(b) costs declared under another EU or Euratom grant (including grants awarded by a Member State and financed by the EU or Euratom budget and grants awarded by bodies other than the

[4] For the definition, see Article 121(1)(b) of Regulation (EU, Euratom) No 966/2012 of the European Parliament and of the Council of 25 October 2012 on the financial rules applicable to the general budget of the Union and repealing Council Regulation (EC, Euratom) No 1605/2002 ('**Financial Regulation No 966/2012**')(OJ L 218, 26.10.2012, p.1): '**operating grant**' means direct financial contribution, by way of donation, from the budget in order to finance the functioning of a body which pursues an aim of general EU interest or has an objective forming part of and supporting an EU policy.

Agency for the purpose of implementing the EU or Euratom budget); in particular, indirect costs if the beneficiary is already receiving an operating grant financed by the EU or Euratom budget in the same period.

6.6 Consequences of declaration of ineligible costs

Declared costs that are ineligible will be rejected (see Article 42).

This may also lead to any of the other measures described in Chapter 6.

CHAPTER 4 RIGHTS AND OBLIGATIONS OF THE PARTIES

SECTION 1 RIGHTS AND OBLIGATIONS RELATED TO IMPLEMENTING THE ACTION

ARTICLE 7 — GENERAL OBLIGATION TO PROPERLY IMPLEMENT THE ACTION

7.1 General obligation to properly implement the action

The beneficiaries must implement the action as described in Annex 1 and in compliance with the provisions of the Agreement and all legal obligations under applicable EU, international and national law.

7.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 8 — RESOURCES TO IMPLEMENT THE ACTION — THIRD PARTIES INVOLVED IN THE ACTION

The beneficiaries must have the appropriate resources to implement the action.

If it is necessary to implement the action, the beneficiaries may:

- purchase goods, works and services (see Article 10);
- use in-kind contributions provided by third parties against payment (see Article 11);
- use in-kind contributions provided by third parties free of charge (see Article 12);
- call upon subcontractors to implement action tasks described in Annex 1 (see Article 13);
- call upon linked third parties to implement action tasks described in Annex 1 (see Article 14).

In these cases, the beneficiaries retain sole responsibility towards the Agency and the other beneficiaries for implementing the action.

ARTICLE 9 — IMPLEMENTATION OF ACTION TASKS BY BENEFICIARIES NOT RECEIVING EU FUNDING

Not applicable

ARTICLE 10 — PURCHASE OF GOODS, WORKS OR SERVICES

10.1 Rules for purchasing goods, works or services

10.1.1 If necessary to implement the action, the beneficiaries may purchase goods, works or services.

The beneficiaries must make such purchases ensuring the best value for money or, if appropriate, the lowest price. In doing so, they must avoid any conflict of interests (see Article 35).

The beneficiaries must ensure that the Agency, the Commission, the European Court of Auditors (ECA) and the European Anti-Fraud Office (OLAF) can exercise their rights under Articles 22 and 23 also towards their contractors.

10.1.2 Beneficiaries that are 'contracting authorities' within the meaning of Directive 2004/18/EC[5] (or 2014/24/EU[6]) or 'contracting entities' within the meaning of Directive 2004/17/EC[7] (or 2014/25/EU[8]) must comply with the applicable national law on public procurement.

10.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under Article 10.1.1, the costs related to the contract concerned will be ineligible (see Article 6) and will be rejected (see Article 42).

If a beneficiary breaches any of its obligations under Article 10.1.2, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 11 — USE OF IN-KIND CONTRIBUTIONS PROVIDED BY THIRD PARTIES AGAINST PAYMENT

11.1 Rules for the use of in-kind contributions against payment

If necessary to implement the action, the beneficiaries may use in-kind contributions provided by third parties against payment.

The beneficiaries may declare costs related to the payment of in-kind contributions as eligible (see

[5] Directive 2004/18/EC of the European Parliament and of the Council of 31 March 2004 on the coordination of procedures for the award of public work contracts, public supply contracts and public service contracts (OJ L 134, 30.04.2004, p. 114).

[6] Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC. (OJ L 94, 28.03.2014, p. 65).

[7] Directive 2004/17/EC of the European Parliament and of the Council of 31 March 2004 coordinating the procurement procedures of entities operating in the water, energy, transport and postal services sectors (OJ L 134, 30.04.2004, p. 1)

[8] Directive 2014/25/EU of the European Parliament and of the Council of 26 February 2014 on procurement by entities operating in the water, energy, transport and postal services sectors and repealing Directive 2004/17/EC (OJ L 94, 28.03.2014, p. 243).

Article 6.1 and 6.2), up to the third parties' costs for the seconded persons, contributed equipment, infrastructure or other assets or other contributed goods and services.

The third parties and their contributions must be set out in Annex 1. The Agency may however approve in-kind contributions not set out in Annex 1 without amendment (see Article 55), if:

- they are specifically justified in the periodic technical report and
- their use does not entail changes to the Agreement which would call into question the decision awarding the grant or breach the principle of equal treatment of applicants.

The beneficiaries must ensure that the Agency, the Commission, the European Court of Auditors (ECA) and the European Anti-Fraud Office (OLAF) can exercise their rights under Articles 22 and 23 also towards the third parties.

11.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the costs related to the payment of the in-kind contribution will be ineligible (see Article 6) and will be rejected (see Article 42).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 12 — USE OF IN-KIND CONTRIBUTIONS PROVIDED BY THIRD PARTIES FREE OF CHARGE

12.1 Rules for the use of in-kind contributions free of charge

If necessary to implement the action, the beneficiaries may use in-kind contributions provided by third parties free of charge.

The beneficiaries may declare costs incurred by the third parties for the seconded persons, contributed equipment, infrastructure or other assets or other contributed goods and services as eligible in accordance with Article 6.4.

The third parties and their contributions must be set out in Annex 1. The Agency may however approve in-kind contributions not set out in Annex 1 without amendment (see Article 55), if:

- they are specifically justified in the periodic technical report and
- their use does not entail changes to the Agreement which would call into question the decision awarding the grant or breach the principle of equal treatment of applicants.

The beneficiaries must ensure that the Agency, the Commission, the European Court of Auditors (ECA) and the European Anti-Fraud Office (OLAF) can exercise their rights under Articles 22 and 23 also towards the third parties.

12.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the costs incurred by the third parties related to the in-kind contribution will be ineligible (see Article 6) and will be rejected (see Article 42).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 13 — IMPLEMENTATION OF ACTION TASKS BY SUBCONTRACTORS

13.1 Rules for subcontracting action tasks

13.1.1 If necessary to implement the action, the beneficiaries may award subcontracts covering the implementation of certain action tasks described in Annex 1.

Subcontracting may cover only a limited part of the action.

The beneficiaries must award the subcontracts ensuring the best value for money or, if appropriate, the lowest price. In doing so, they must avoid any conflict of interests (see Article 35).

The tasks to be implemented and the estimated cost for each subcontract must be set out in Annex 1 and the total estimated costs of subcontracting per beneficiary must be set out in Annex 2. The Agency may however approve subcontracts not set out in Annex 1 and 2 without amendment (see Article 55), if:

- they are specifically justified in the periodic technical report and
- they do not entail changes to the Agreement which would call into question the decision awarding the grant or breach the principle of equal treatment of applicants.

The beneficiaries must ensure that the Agency, the Commission, the European Court of Auditors (ECA) and the European Anti-Fraud Office (OLAF) can exercise their rights under Articles 22 and 23 also towards their subcontractors.

13.1.2 The beneficiaries must ensure that their obligations under Articles 35, 36, 38 and 46 also apply to the subcontractors.

Beneficiaries that are 'contracting authorities' within the meaning of Directive 2004/18/EC (or 2014/24/EU) or 'contracting entities' within the meaning of Directive 2004/17/EC (or 2014/25/EU) must comply with the applicable national law on public procurement.

13.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under Article 13.1.1, the costs related to the subcontract concerned will be ineligible (see Article 6) and will be rejected (see Article 42).

If a beneficiary breaches any of its obligations under Article 13.1.2, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 14 — IMPLEMENTATION OF ACTION TASKS BY LINKED THIRD PARTIES

14.1 Rules for calling upon linked third parties to implement part of the action

14.1.1 The following **affiliated entities**[10] and **third parties with a legal link to a beneficiary**[11] ('**linked third parties**') may implement the action tasks attributed to them in Annex 1:

[10] For the definition see Article 2.1(2) Rules for Participation Regulation No 1290/2013: '**affiliated entity**' means any legal entity that is:

- EIGEN VERMOGEN INFORMATIE VLAANDEREN (EVIV), affiliated or linked to AIV

The linked third parties may declare as eligible the costs they incur for implementing the action tasks in accordance with Article 6.3.

The beneficiaries must ensure that the Agency, the Commission, the European Court of Auditors (ECA) and the European Anti-Fraud Office (OLAF) can exercise their rights under Articles 22 and 23 also towards their linked third parties.

14.1.2 The beneficiaries must ensure that their obligations under Articles 18, 20, 35, 36 and 38 also apply to their linked third parties.

14.2 Consequences of non-compliance

If any obligation under Article 14.1.1 is breached, the costs of the linked third party will be ineligible (see Article 6) and will be rejected (see Article 42).

If any obligation under Article 14.1.2 is breached, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 15 — FINANCIAL SUPPORT TO THIRD PARTIES

15.1 Rules for providing financial support to third parties

Not applicable

15.2 Financial support in the form of prizes

Not applicable

15.3 Consequences of non-compliance

Not applicable

ARTICLE 16 — PROVISION OF TRANS-NATIONAL OR VIRTUAL ACCESS TO RESEARCH INFRASTRUCTURE

- under the direct or indirect control of a participant, or
- under the same direct or indirect control as the participant, or
- directly or indirectly controlling a participant.

'Control' may take any of the following forms:

(a) the direct or indirect holding of more than 50% of the nominal value of the issued share capital in the legal entity concerned, or of a majority of the voting rights of the shareholders or associates of that entity;

(b) the direct or indirect holding, in fact or in law, of decision-making powers in the legal entity concerned.

However the following relationships between legal entities shall not in themselves be deemed to constitute controlling relationships:

(a) the same public investment corporation, institutional investor or venture-capital company has a direct or indirect holding of more than 50% of the nominal value of the issued share capital or a majority of voting rights of the shareholders or associates;

(b) the legal entities concerned are owned or supervised by the same public body.

[11] '**Third party with a legal link to a beneficiary**' is any legal entity which has a legal link to the beneficiary implying collaboration that is not limited to the action.

16.1 Rules for providing trans-national access to research infrastructure

Not applicable

16.2 Rules for providing virtual access to research infrastructure

Not applicable

16.3 Consequences of non-compliance

Not applicable

SECTION 2 RIGHTS AND OBLIGATIONS RELATED TO THE GRANT ADMINISTRATION

ARTICLE 17 — GENERAL OBLIGATION TO INFORM

17.1 General obligation to provide information upon request

The beneficiaries must provide — during implementation of the action or afterwards and in accordance with Article 41.2 — any information requested in order to verify eligibility of the costs, proper implementation of the action and compliance with any other obligation under the Agreement.

17.2 Obligation to keep information up to date and to inform about events and circumstances likely to affect the Agreement

Each beneficiary must keep information stored in the Participant Portal Beneficiary Register (via the electronic exchange system; see Article 52) up to date, in particular, its name, address, legal representatives, legal form and organisation type.

Each beneficiary must immediately inform the coordinator — which must immediately inform the Agency and the other beneficiaries — of any of the following:

(a) **events** which are likely to affect significantly or delay the implementation of the action or the EU's financial interests, in particular:

(i) changes in its legal, financial, technical, organisational or ownership situation or those of its linked third parties and

(ii) changes in the name, address, legal form, organisation type of its linked third parties;

(b) **circumstances** affecting:

(i) the decision to award the grant or

(ii) compliance with requirements under the Agreement.

17.3 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 18 — KEEPING RECORDS — SUPPORTING DOCUMENTATION

18.1 Obligation to keep records and other supporting documentation

The beneficiaries must — for a period of five years after the payment of the balance — keep records and other supporting documentation in order to prove the proper implementation of the action and the costs they declare as eligible.

They must make them available upon request (see Article 17) or in the context of checks, reviews, audits or investigations (see Article 22).

If there are on-going checks, reviews, audits, investigations, litigation or other pursuits of claims under the Agreement (including the extension of findings; see Article 22), the beneficiaries must keep the records and other supporting documentation until the end of these procedures.

The beneficiaries must keep the original documents. Digital and digitalised documents are considered originals if they are authorised by the applicable national law. The Agency may accept non-original documents if it considers that they offer a comparable level of assurance.

18.1.1 Records and other supporting documentation on the scientific and technical implementation

The beneficiaries must keep records and other supporting documentation on scientific and technical implementation of the action in line with the accepted standards in the respective field.

18.1.2 Records and other documentation to support the costs declared

The beneficiaries must keep the records and documentation supporting the costs declared, in particular the following:

(a) for **actual costs**: adequate records and other supporting documentation to prove the costs declared, such as contracts, subcontracts, invoices and accounting records. In addition, the beneficiaries' usual cost accounting practices and internal control procedures must enable direct reconciliation between the amounts declared, the amounts recorded in their accounts and the amounts stated in the supporting documentation;

(b) for **unit costs**: adequate records and other supporting documentation to prove the number of units declared. Beneficiaries do not need to identify the actual eligible costs covered or to keep or provide supporting documentation (such as accounting statements) to prove the amount per unit.

In addition, **for direct personnel costs declared as unit costs calculated in accordance with the beneficiary's usual cost accounting practices**, the beneficiaries must keep adequate records and documentation to prove that the cost accounting practices used comply with the conditions set out in Article 6.2, Point A.

The beneficiaries and linked third parties may submit to the Commission, for approval, a certificate (drawn up in accordance with Annex 6) stating that their usual cost accounting practices comply with these conditions (‘**certificate on the methodology**’). If the certificate

is approved, costs declared in line with this methodology will not be challenged subsequently, unless the beneficiaries have concealed information for the purpose of the approval.

(c) for **flat-rate costs**: adequate records and other supporting documentation to prove the eligibility of the costs to which the flat-rate is applied. The beneficiaries do not need to identify the costs covered or provide supporting documentation (such as accounting statements) to prove the amount declared at a flat-rate.

In addition, for **personnel costs** (declared as actual costs or on the basis of unit costs), the beneficiaries must keep **time records** for the number of hours declared. The time records must be in writing and approved by the persons working on the action and their supervisors, at least monthly. In the absence of reliable time records of the hours worked on the action, the Agency may accept alternative evidence supporting the number of hours declared, if it considers that it offers an adequate level of assurance.

As an exception, for **persons working exclusively on the action**, there is no need to keep time records, if the beneficiary signs a **declaration** confirming that the persons concerned have worked exclusively on the action.

For costs declared by linked third parties (see Article 14), it is the beneficiary that must keep the originals of the financial statements and the certificates on the financial statements of the linked third parties.

18.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, costs insufficiently substantiated will be ineligible (see Article 6) and will be rejected (see Article 42), and the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 19 — SUBMISSION OF DELIVERABLES

19.1 Obligation to submit deliverables

The coordinator must submit the '**deliverables**' identified in Annex 1, in accordance with the timing and conditions set out in it.

19.2 Consequences of non-compliance

If the coordinator breaches any of its obligations under this Article, the Agency may apply any of the measures described in Chapter 6.

ARTICLE 20 — REPORTING — PAYMENT REQUESTS

20.1 Obligation to submit reports

The coordinator must submit to the Agency (see Article 52) the technical and financial reports set out in this Article. These reports include requests for payment and must be drawn up using the forms and templates provided in the electronic exchange system (see Article 52).

20.2 Reporting periods

The action is divided into the following '**reporting periods**':

- RP1: from month 1 to month 12
- RP2: from month 13 to month 36

20.3 Periodic reports — Requests for interim payments

The coordinator must submit a periodic report within 60 days following the end of each reporting period.

The **periodic report** must include the following:

(a) a '**periodic technical report**' containing:

(i) an **explanation of the work carried out** by the beneficiaries;

(ii) an **overview of the progress** towards the objectives of the action, including milestones and deliverables identified in Annex 1.

This report must include explanations justifying the differences between work expected to be carried out in accordance with Annex 1 and that actually carried out.

The report must detail the exploitation and dissemination of the results and — if required in Annex 1 — an updated '**plan for the exploitation and dissemination of the results**'.

The report must indicate the communication activities;

(iii) a **summary** for publication by the Agency;

(iv) the answers to the '**questionnaire**', covering issues related to the action implementation and the economic and societal impact, notably in the context of the Horizon 2020 key performance indicators and the Horizon 2020 monitoring requirements;

(b) a '**periodic financial report**' containing:

(i) an '**individual financial statement**' (see Annex 4) from each beneficiary and from each linked third party, for the reporting period concerned.

The individual financial statement must detail the eligible costs (actual costs, unit costs and flat-rate costs; see Article 6) for each budget category (see Annex 2).

The beneficiaries and linked third parties must declare all eligible costs, even if — for actual costs, unit costs and flat-rate costs — they exceed the amounts indicated in the estimated budget (see Annex 2). Amounts which are not declared in the individual financial statement will not be taken into account by the Agency.

If an individual financial statement is not submitted for a reporting period, it may be included in the periodic financial report for the next reporting period.

The individual financial statements of the last reporting period must also detail the **receipts of the action** (see Article 5.3.3).

Each beneficiary and each linked third party must **certify** that:

- the information provided is full, reliable and true;
- the costs declared are eligible (see Article 6);
- the costs can be substantiated by adequate records and supporting documentation (see Article 18) that will be produced upon request (see Article 17) or in the context of checks, reviews, audits and investigations (see Article 22), and
- for the last reporting period: that all the receipts have been declared (see Article 5.3.3);

(ii) an **explanation of the use of resources** and the information on subcontracting (see Article 13) and in-kind contributions provided by third parties (see Articles 11 and 12) from each beneficiary and from each linked third party, for the reporting period concerned;

(iii) not applicable;

(iv) a '**periodic summary financial statement**', created automatically by the electronic exchange system, consolidating the individual financial statements for the reporting period concerned and including — except for the last reporting period — the **request for interim payment**.

20.4 Final report — Request for payment of the balance

In addition to the periodic report for the last reporting period, the coordinator must submit the final report within 60 days following the end of the last reporting period.

The **final report** must include the following:

(a) a '**final technical report**' with a **summary** for publication containing:

(i) an overview of the results and their exploitation and dissemination;

(ii) the conclusions on the action, and

(iii) the socio-economic impact of the action;

(b) a '**final financial report**' containing:

(i) a '**final summary financial statement**', created automatically by the electronic exchange system, consolidating the individual financial statements for all reporting periods and including the **request for payment of the balance** and

(ii) a '**certificate on the financial statements**' (drawn up in accordance with Annex 5) for each beneficiary and for each linked third party, if it requests a total contribution of EUR 325 000 or more, as reimbursement of actual costs and unit costs calculated on the basis of its usual cost accounting practices (see Article 5.2 and Article 6.2, Point A).

20.5 Information on cumulative expenditure incurred

Not applicable

20.6 Currency for financial statements and conversion into euro

Financial statements must be drafted in euro.

Beneficiaries and linked third parties with accounting established in a currency other than the euro must convert the costs recorded in their accounts into euro, at the average of the daily exchange rates published in the C series of the *Official Journal of the European Union*, calculated over the corresponding reporting period.

If no daily euro exchange rate is published in the *Official Journal of the European Union* for the currency in question, they must be converted at the average of the monthly accounting rates published on the Commission's website, calculated over the corresponding reporting period.

Beneficiaries and linked third parties with accounting established in euro must convert costs incurred in another currency into euro according to their usual accounting practices.

20.7 Language of reports

All reports (technical and financial reports, including financial statements) must be submitted in the language of the Agreement.

20.8 Consequences of non-compliance

If the reports submitted do not comply with this Article, the Agency may suspend the payment deadline (see Article 47) and apply any of the other measures described in Chapter 6.

If the coordinator breaches its obligation to submit the reports and if it fails to comply with this obligation within 30 days following a written reminder, the Agency may terminate the Agreement (see Article 50) or apply any of the other measures described in Chapter 6.

ARTICLE 21 — PAYMENTS AND PAYMENT ARRANGEMENTS

21.1 Payments to be made

The following payments will be made to the coordinator:

- one **pre-financing payment**;
- one or more **interim payments**, on the basis of the request(s) for interim payment (see Article 20), and
- one **payment of the balance**, on the basis of the request for payment of the balance (see Article 20).

21.2 Pre-financing payment — Amount — Amount retained for the Guarantee Fund

The aim of the pre-financing is to provide the beneficiaries with a float.

It remains the property of the EU until the payment of the balance.

The amount of the pre-financing payment will be EUR **3,126,160.00** (three million one hundred and twenty six thousand one hundred and sixty EURO).

The Agency will — except if Article 48 applies — make the pre-financing payment to the coordinator within 30 days, either from the entry into force of the Agreement (see Article 58) or from 10 days before the starting date of the action (see Article 3), whichever is the latest.

An amount of EUR **195,385.00** (one hundred and ninety five thousand three hundred and eighty five EURO), corresponding to 5% of the maximum grant amount (see Article 5.1), is retained by the Agency from the pre-financing payment and transferred into the '**Guarantee Fund**'.

21.3 Interim payments — Amount — Calculation

Interim payments reimburse the eligible costs incurred for the implementation of the action during the corresponding reporting periods.

The Agency will pay to the coordinator the amount due as interim payment within 90 days from receiving the periodic report (see Article 20.3), except if Articles 47 or 48 apply.

Payment is subject to the approval of the periodic report. Its approval does not imply recognition of the compliance, authenticity, completeness or correctness of its content.

The **amount due as interim payment** is calculated by the Agency in the following steps:

Step 1 – Application of the reimbursement rates

Step 2 – Limit to 90% of the maximum grant amount

21.3.1 Step 1 — Application of the reimbursement rates

The reimbursement rate(s) (see Article 5.2) are applied to the eligible costs (actual costs, unit costs and flat-rate costs ; see Article 6) declared by the beneficiaries and the linked third parties (see Article 20) and approved by the Agency (see above) for the concerned reporting period.

21.3.2 Step 2 — Limit to 90% of the maximum grant amount

The total amount of pre-financing and interim payments must not exceed 90% of the maximum grant amount set out in Article 5.1. The maximum amount for the interim payment will be calculated as follows:

{90% of the maximum grant amount (see Article 5.1)

minus

{pre-financing and previous interim payments}}.

21.4 Payment of the balance — Amount — Calculation — Release of the amount retained for the Guarantee Fund

The payment of the balance reimburses the remaining part of the eligible costs incurred by the beneficiaries for the implementation of the action.

If the total amount of earlier payments is greater than the final grant amount (see Article 5.3), the payment of the balance takes the form of a recovery (see Article 44).

If the total amount of earlier payments is lower than the final grant amount, the Agency will pay the

balance within 90 days from receiving the final report (see Article 20.4), except if Articles 47 or 48 apply.

Payment is subject to the approval of the final report. Its approval does not imply recognition of the compliance, authenticity, completeness or correctness of its content.

The **amount due as the balance** is calculated by the Agency by deducting the total amount of pre-financing and interim payments (if any) already made, from the final grant amount determined in accordance with Article 5.3:

{final grant amount (see Article 5.3)

minus

{pre-financing and interim payments (if any) made}}.

At the payment of the balance, the amount retained for the Guarantee Fund (see above) will be released and:

- if the balance is positive: the amount released will be paid in full to the coordinator together with the amount due as the balance;
- if the balance is negative (payment of the balance taking the form of recovery): it will be deducted from the amount released (see Article 44.1.2). If the resulting amount:
    - is positive, it will be paid to the coordinator
    - is negative, it will be recovered.

The amount to be paid may however be offset — without the beneficiaries' consent — against any other amount owed by a beneficiary to the Agency, the Commission or another executive agency (under the EU or Euratom budget), up to the maximum EU contribution indicated, for that beneficiary, in the estimated budget (see Annex 2).

21.5 Notification of amounts due

When making payments, the Agency will formally notify to the coordinator the amount due, specifying whether it concerns an interim payment or the payment of the balance.

For the payment of the balance, the notification will also specify the final grant amount.

In the case of reduction of the grant or recovery of undue amounts, the notification will be preceded by the contradictory procedure set out in Articles 43 and 44.

21.6 Currency for payments

The Agency will make all payments in euro.

21.7 Payments to the coordinator — Distribution to the beneficiaries

Payments will be made to the coordinator.

Payments to the coordinator will discharge the Agency from its payment obligation.

The coordinator must distribute the payments between the beneficiaries without unjustified delay.

Pre-financing may however be distributed only:

(a) if the minimum number of beneficiaries set out in the call for proposals has acceded to the Agreement (see Article 56) and

(b) to beneficiaries that have acceded to the Agreement (see Article 56).

21.8 Bank account for payments

All payments will be made to the following bank account:

Name of bank:
Full name of the account holder:
Full account number (including bank codes): ()
IBAN code:

21.9 Costs of payment transfers

The cost of the payment transfers is borne as follows:

- the Agency bears the cost of transfers charged by its bank;
- the beneficiary bears the cost of transfers charged by its bank;
- the party causing a repetition of a transfer bears all costs of the repeated transfer.

21.10 Date of payment

Payments by the Agency are considered to have been carried out on the date when they are debited to its account.

21.11 Consequences of non-compliance

21.11.1 If the Agency does not pay within the payment deadlines (see above), the beneficiaries are entitled to **late-payment interest** at the rate applied by the European Central Bank (ECB) for its main refinancing operations in euros ('reference rate'), plus three and a half points. The reference rate is the rate in force on the first day of the month in which the payment deadline expires, as published in the C series of the *Official Journal of the European Union*.

If the late-payment interest is lower than or equal to EUR 200, it will be paid to the coordinator only upon request submitted within two months of receiving the late payment.

Late-payment interest is not due if all beneficiaries are EU Member States (including regional and local government authorities or other public bodies acting on behalf of a Member State for the purpose of this Agreement).

Suspension of the payment deadline or payments (see Articles 47 and 48) will not be considered as late payment.

Late-payment interest covers the period running from the day following the due date for payment (see above), up to and including the date of payment.

Late-payment interest is not considered for the purposes of calculating the final grant amount.

21.11.2 If the coordinator breaches any of its obligations under this Article, the grant may be reduced (see Article 43) and the Agreement or the participation of the coordinator may be terminated (see Article 50).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 22 — CHECKS, REVIEWS, AUDITS AND INVESTIGATIONS — EXTENSION OF FINDINGS

22.1 Checks, reviews and audits by the Agency and the Commission

22.1.1 Right to carry out checks

The Agency or the Commission will — during the implementation of the action or afterwards — check the proper implementation of the action and compliance with the obligations under the Agreement, including assessing deliverables and reports.

For this purpose the Agency or the Commission may be assisted by external persons or bodies.

The Agency or the Commission may also request additional information in accordance with Article 17. The Agency or the Commission may request beneficiaries to provide such information to it directly.

Information provided must be accurate, precise and complete and in the format requested, including electronic format.

22.1.2 Right to carry out reviews

The Agency or the Commission may — during the implementation of the action or afterwards — carry out reviews on the proper implementation of the action (including assessment of deliverables and reports), compliance with the obligations under the Agreement and continued scientific or technological relevance of the action.

Reviews may be started up to two years after the payment of the balance. They will be formally notified to the coordinator or beneficiary concerned and will be considered to have started on the date of the formal notification.

If the review is carried out on a third party (see Articles 10 to 16), the beneficiary concerned must inform the third party.

The Agency or the Commission may carry out reviews directly (using its own staff) or indirectly (using external persons or bodies appointed to do so). It will inform the coordinator or beneficiary concerned of the identity of the external persons or bodies. They have the right to object to the appointment on grounds of commercial confidentiality.

The coordinator or beneficiary concerned must provide — within the deadline requested — any information and data in addition to deliverables and reports already submitted (including information

on the use of resources). The Agency or the Commission may request beneficiaries to provide such information to it directly.

The coordinator or beneficiary concerned may be requested to participate in meetings, including with external experts.

For **on-the-spot** reviews, the beneficiaries must allow access to their sites and premises, including to external persons or bodies, and must ensure that information requested is readily available.

Information provided must be accurate, precise and complete and in the format requested, including electronic format.

On the basis of the review findings, a '**review report**' will be drawn up.

The Agency or the Commission will formally notify the review report to the coordinator or beneficiary concerned, which has 30 days to formally notify observations ('**contradictory review procedure**').

Reviews (including review reports) are in the language of the Agreement.

22.1.3 Right to carry out audits

The Agency or the Commission may — during the implementation of the action or afterwards — carry out audits on the proper implementation of the action and compliance with the obligations under the Agreement.

Audits may be started up to two years after the payment of the balance. They will be formally notified to the coordinator or beneficiary concerned and will be considered to have started on the date of the formal notification.

If the audit is carried out on a third party (see Articles 10 to 16), the beneficiary concerned must inform the third party.

The Agency or the Commission may carry out audits directly (using its own staff) or indirectly (using external persons or bodies appointed to do so). It will inform the coordinator or beneficiary concerned of the identity of the external persons or bodies. They have the right to object to the appointment on grounds of commercial confidentiality.

The coordinator or beneficiary concerned must provide — within the deadline requested — any information (including complete accounts, individual salary statements or other personal data) to verify compliance with the Agreement. The Agency or the Commission may request beneficiaries to provide such information to it directly.

For **on-the-spot** audits, the beneficiaries must allow access to their sites and premises, including to external persons or bodies, and must ensure that information requested is readily available.

Information provided must be accurate, precise and complete and in the format requested, including electronic format.

On the basis of the audit findings, a '**draft audit report**' will be drawn up.

The Agency or the Commission will formally notify the draft audit report to the coordinator or beneficiary concerned, which has 30 days to formally notify observations ('**contradictory audit procedure**'). This period may be extended by the Agency or the Commission in justified cases.

The '**final audit report**' will take into account observations by the coordinator or beneficiary concerned. The report will be formally notified to it.

Audits (including audit reports) are in the language of the Agreement.

The Agency or the Commission may also access the beneficiaries' statutory records for the periodical assessment of unit costs or flat-rate amounts.

22.2 Investigations by the European Anti-Fraud Office (OLAF)

Under Regulations No 883/2013 [14] and No 2185/96 [15] (and in accordance with their provisions and procedures) the European Anti-Fraud Office (OLAF) may — at any moment during implementation of the action or afterwards — carry out investigations, including on-the-spot checks and inspections, to establish whether there has been fraud, corruption or any other illegal activity affecting the financial interests of the EU.

22.3 Checks and audits by the European Court of Auditors (ECA)

Under Article 287 of the Treaty on the Functioning of the European Union (TFEU) and Article 161 of the Financial Regulation No 966/2012 [17], the European Court of Auditors (ECA) may — at any moment during implementation of the action or afterwards — carry out audits.

The ECA has the right of access for the purpose of checks and audits.

22.4 Checks, reviews, audits and investigations for international organisations

Not applicable

22.5 Consequences of findings in checks, reviews, audits and investigations — Extension of findings

22.5.1 Findings in this grant

Findings in checks, reviews, audits or investigations carried out in the context of this grant may lead to the rejection of ineligible costs (see Article 42), reduction of the grant (see Article 43), recovery of undue amounts (see Article 44) or to any of the other measures described in Chapter 6.

Rejection of costs or reduction of the grant after the payment of the balance will lead to a revised final grant amount (see Article 5.4).

Findings in checks, reviews, audits or investigations may lead to a request for amendment for the modification of Annex 1 (see Article 55).

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[14] Regulation (EU, Euratom) No 883/2013 of the European Parliament and of the Council of 11 September 2013 concerning investigations conducted by the European Anti-Fraud Office (OLAF) and repealing Regulation (EC) No 1073/1999 of the European Parliament and of the Council and Council Regulation (Euratom) No 1074/1999 (OJ L 248, 18.09.2013, p. 1).

[15] Council Regulation (Euratom, EC) No 2185/1996 of 11 November 1996 concerning on-the-spot checks and inspections carried out by the Commission in order to protect the European Communities' financial interests against fraud and other irregularities (OJ L 292, 15.11.1996, p. 2).

[17] Regulation (EU, Euratom) No 966/2012 of the European Parliament and of the Council of 25 October 2012 on the financial rules applicable to the general budget of the Union and repealing Council Regulation (EC, Euratom) No 1605/2002 (OJ L 298, 26.10.2012, p. 1).

Checks, reviews, audits or investigations that find systemic or recurrent errors, irregularities, fraud or breach of obligations may also lead to consequences in other EU or Euratom grants awarded under similar conditions ('**extension of findings from this grant to other grants**').

Moreover, findings arising from an OLAF investigation may lead to criminal prosecution under national law.

22.5.2 Findings in other grants

The Agency or the Commission may extend findings from other grants to this grant ('**extension of findings from other grants to this grant**'), if:

(a) the beneficiary concerned is found, in other EU or Euratom grants awarded under similar conditions, to have committed systemic or recurrent errors, irregularities, fraud or breach of obligations that have a material impact on this grant and

(b) those findings are formally notified to the beneficiary concerned — together with the list of grants affected by the findings — no later than two years after the payment of the balance of this grant.

The extension of findings may lead to the rejection of costs (see Article 42), reduction of the grant (see Article 43), recovery of undue amounts (see Article 44), suspension of payments (see Article 48), suspension of the action implementation (see Article 49) or termination (see Article 50).

22.5.3 Procedure

The Agency or the Commission will formally notify the beneficiary concerned the systemic or recurrent errors and its intention to extend these audit findings, together with the list of grants affected.

22.5.3.1 If the findings concern **eligibility of costs**: the formal notification will include:

(a) an invitation to submit observations on the list of grants affected by the findings;

(b) the request to submit **revised financial statements** for all grants affected;

(c) the **correction rate for extrapolation** established by the Agency or the Commission on the basis of the systemic or recurrent errors, to calculate the amounts to be rejected if the beneficiary concerned:

(i) considers that the submission of revised financial statements is not possible or practicable or

(ii) does not submit revised financial statements.

The beneficiary concerned has 90 days from receiving notification to submit observations, revised financial statements or to propose a duly substantiated **alternative correction method**. This period may be extended by the Agency or the Commission in justified cases.

The Agency or the Commission may then start a rejection procedure in accordance with Article 42, on the basis of:

- the revised financial statements, if approved;

- the proposed alternative correction method, if accepted

or

- the initially notified correction rate for extrapolation, if it does not receive any observations or revised financial statements, does not accept the observations or the proposed alternative correction method or does not approve the revised financial statements.

22.5.3.2 If the findings concern **substantial errors**, **irregularities or fraud** or **serious breach of obligations**: the formal notification will include:

(a) an invitation to submit observations on the list of grants affected by the findings and

(b) the flat-rate the Agency or the Commission intends to apply according to the principle of proportionality.

The beneficiary concerned has 90 days from receiving notification to submit observations or to propose a duly substantiated alternative flat-rate.

The Agency or the Commission may then start a reduction procedure in accordance with Article 43, on the basis of:

- the proposed alternative flat-rate, if accepted

or

- the initially notified flat-rate, if it does not receive any observations or does not accept the observations or the proposed alternative flat-rate.

22.6 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, any insufficiently substantiated costs will be ineligible (see Article 6) and will be rejected (see Article 42).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 23 — EVALUATION OF THE IMPACT OF THE ACTION

23.1 Right to evaluate the impact of the action

The Agency or the Commission may carry out interim and final evaluations of the impact of the action measured against the objective of the EU programme.

Evaluations may be started during implementation of the action and up to five years after the payment of the balance. The evaluation is considered to start on the date of the formal notification to the coordinator or beneficiaries.

The Agency or the Commission may make these evaluations directly (using its own staff) or indirectly (using external bodies or persons it has authorised to do so).

The coordinator or beneficiaries must provide any information relevant to evaluate the impact of the action, including information in electronic format.

23.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the Agency may apply the measures described in Chapter 6.

SECTION 3 RIGHTS AND OBLIGATIONS RELATED TO BACKGROUND AND RESULTS

SUBSECTION 1 GENERAL

ARTICLE 23a — MANAGEMENT OF INTELLECTUAL PROPERTY

23a.1 Obligation to take measures to implement the Commission Recommendation on the management of intellectual property in knowledge transfer activities

Beneficiaries that are universities or other public research organisations must take measures to implement the principles set out in Points 1 and 2 of the Code of Practice annexed to the Commission Recommendation on the management of intellectual property in knowledge transfer activities[17].

This does not change the obligations set out in Subsections 2 and 3 of this Section.

The beneficiaries must ensure that researchers and third parties involved in the action are aware of them.

23a.2 Consequences of non-compliance

If a beneficiary breaches its obligations under this Article, the Agency may apply any of the measures described in Chapter 6.

SUBSECTION 2 RIGHTS AND OBLIGATIONS RELATED TO BACKGROUND

ARTICLE 24 — AGREEMENT ON BACKGROUND

24.1 Agreement on background

The beneficiaries must identify and agree (in writing) on the background for the action ('**agreement on background**').

'**Background**' means any data, know-how or information — whatever its form or nature (tangible or intangible), including any rights such as intellectual property rights — that:

(a) is held by the beneficiaries before they acceded to the Agreement, and

(b) is needed to implement the action or exploit the results.

24.2 Consequences of non-compliance

[17] Commission Recommendation C(2008) 1329 of 10.4.2008 on the management of intellectual property in knowledge transfer activities and the Code of Practice for universities and other public research institutions attached to this recommendation.

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 25 — ACCESS RIGHTS TO BACKGROUND

25.1 Exercise of access rights — Waiving of access rights — No sub-licensing

To exercise access rights, this must first be requested in writing ('**request for access**').

'**Access rights**' means rights to use results or background under the terms and conditions laid down in this Agreement.

Waivers of access rights are not valid unless in writing.

Unless agreed otherwise, access rights do not include the right to sub-license.

25.2 Access rights for other beneficiaries, for implementing their own tasks under the action

The beneficiaries must give each other access — on a royalty-free basis — to background needed to implement their own tasks under the action, unless the beneficiary that holds the background has — before acceding to the Agreement —:

(a) informed the other beneficiaries that access to its background is subject to legal restrictions or limits, including those imposed by the rights of third parties (including personnel), or

(b) agreed with the other beneficiaries that access would not be on a royalty-free basis.

25.3 Access rights for other beneficiaries, for exploiting their own results

The beneficiaries must give each other access — under fair and reasonable conditions — to background needed for exploiting their own results, unless the beneficiary that holds the background has — before acceding to the Agreement — informed the other beneficiaries that access to its background is subject to legal restrictions or limits, including those imposed by the rights of third parties (including personnel).

'**Fair and reasonable conditions**' means appropriate conditions, including possible financial terms or royalty-free conditions, taking into account the specific circumstances of the request for access, for example the actual or potential value of the results or background to which access is requested and/or the scope, duration or other characteristics of the exploitation envisaged.

Requests for access may be made — unless agreed otherwise — up to one year after the period set out in Article 3.

25.4 Access rights for affiliated entities

Unless otherwise agreed in the consortium agreement, access to background must also be given — under fair and reasonable conditions (see above; Article 25.3) and unless it is subject to legal restrictions or limits, including those imposed by the rights of third parties (including personnel) —

to affiliated entities[18] established in an EU Member State or '**associated country**'[19], if this is needed to exploit the results generated by the beneficiaries to which they are affiliated.

Unless agreed otherwise (see above; Article 25.1), the affiliated entity concerned must make the request directly to the beneficiary that holds the background.

Requests for access may be made — unless agreed otherwise — up to one year after the period set out in Article 3.

25.5 Access rights for third parties

Not applicable

25.6 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

SUBSECTION 3 RIGHTS AND OBLIGATIONS RELATED TO RESULTS

ARTICLE 26 — OWNERSHIP OF RESULTS

26.1 Ownership by the beneficiary that generates the results

Results are owned by the beneficiary that generates them.

'**Results**' means any (tangible or intangible) output of the action such as data, knowledge or information — whatever its form or nature, whether it can be protected or not — that is generated in the action, as well as any rights attached to it, including intellectual property rights.

26.2 Joint ownership by several beneficiaries

Two or more beneficiaries own results jointly if:

(a) they have jointly generated them and

(b) it is not possible to:

(i) establish the respective contribution of each beneficiary, or

(ii) separate them for the purpose of applying for, obtaining or maintaining their protection (see Article 27).

[18] For the definition, see 'affiliated entity' footnote (Article 14.1).

[19] For the definition, see Article 2.1(3) of the Rules for Participation Regulation No 1290/2013: '**associated country**' means a third country which is party to an international agreement with the Union, as identified in Article 7 of Horizon 2020 Framework Programme Regulation No 1291/2013. Article 7 sets out the conditions for association of non-EU countries to Horizon 2020.

The joint owners must agree (in writing) on the allocation and terms of exercise of their joint ownership ('**joint ownership agreement**'), to ensure compliance with their obligations under this Agreement.

Unless otherwise agreed in the joint ownership agreement, each joint owner may grant non-exclusive licences to third parties to exploit jointly-owned results (without any right to sub-license), if the other joint owners are given:

(a) at least 45 days advance notice and

(b) fair and reasonable compensation.

Once the results have been generated, joint owners may agree (in writing) to apply another regime than joint ownership (such as, for instance, transfer to a single owner (see Article 30) with access rights for the others).

26.3 Rights of third parties (including personnel)

If third parties (including personnel) may claim rights to the results, the beneficiary concerned must ensure that it complies with its obligations under the Agreement.

If a third party generates results, the beneficiary concerned must obtain all necessary rights (transfer, licences or other) from the third party, in order to be able to respect its obligations as if those results were generated by the beneficiary itself.

If obtaining the rights is impossible, the beneficiary must refrain from using the third party to generate the results.

26.4 Agency ownership, to protect results

26.4.1 The Agency may — with the consent of the beneficiary concerned — assume ownership of results to protect them, if a beneficiary intends — up to four years after the period set out in Article 3 — to disseminate its results without protecting them, except in any of the following cases:

(a) the lack of protection is because protecting the results is not possible, reasonable or justified (given the circumstances);

(b) the lack of protection is because there is a lack of potential for commercial or industrial exploitation, or

(c) the beneficiary intends to transfer the results to another beneficiary or third party established in an EU Member State or associated country, which will protect them.

Before the results are disseminated and unless any of the cases above under Points (a), (b) or (c) applies, the beneficiary must formally notify the Agency and at the same time inform it of any reasons for refusing consent. The beneficiary may refuse consent only if it can show that its legitimate interests would suffer significant harm.

If the Agency decides to assume ownership, it will formally notify the beneficiary concerned within 45 days of receiving notification.

No dissemination relating to these results may take place before the end of this period or, if the Agency takes a positive decision, until it has taken the necessary steps to protect the results.

26.4.2 The Agency may — with the consent of the beneficiary concerned — assume ownership of results to protect them, if a beneficiary intends — up to four years after the period set out in Article 3 — to stop protecting them or not to seek an extension of protection, except in any of the following cases:

(a) the protection is stopped because of a lack of potential for commercial or industrial exploitation;

(b) an extension would not be justified given the circumstances.

A beneficiary that intends to stop protecting results or not seek an extension must — unless any of the cases above under Points (a) or (b) applies — formally notify the Agency at least 60 days before the protection lapses or its extension is no longer possible and at the same time inform it of any reasons for refusing consent. The beneficiary may refuse consent only if it can show that its legitimate interests would suffer significant harm.

If the Agency decides to assume ownership, it will formally notify the beneficiary concerned within 45 days of receiving notification.

26.5 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to the any of the other measures described in Chapter 6.

ARTICLE 27 — PROTECTION OF RESULTS — VISIBILITY OF EU FUNDING

27.1 Obligation to protect the results

Each beneficiary must examine the possibility of protecting its results and must adequately protect them — for an appropriate period and with appropriate territorial coverage — if:

(a) the results can reasonably be expected to be commercially or industrially exploited and

(b) protecting them is possible, reasonable and justified (given the circumstances).

When deciding on protection, the beneficiary must consider its own legitimate interests and the legitimate interests (especially commercial) of the other beneficiaries.

27.2 Agency ownership, to protect the results

If a beneficiary intends not to protect its results, to stop protecting them or not seek an extension of protection, the Agency may — under certain conditions (see Article 26.4) — assume ownership to ensure their (continued) protection.

27.3 Information on EU funding

Applications for protection of results (including patent applications) filed by or on behalf of a beneficiary must — unless the Agency requests or agrees otherwise or unless it is impossible — include the following:

> *"The project leading to this application has received funding from the* European Union's Horizon 2020 research and innovation programme *under grant agreement No 769608".*

27.4 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such a breach may also lead to any of the other measures described in Chapter 6.

ARTICLE 28 — EXPLOITATION OF RESULTS

28.1 Obligation to exploit the results

Each beneficiary must — up to four years after the period set out in Article 3 — take measures aiming to ensure '**exploitation**' of its results (either directly or indirectly, in particular through transfer or licensing; see Article 30) by:

(a) using them in further research activities (outside the action);

(b) developing, creating or marketing a product or process;

(c) creating and providing a service, or

(d) using them in standardisation activities.

This does not change the security obligations in Article 37, which still apply.

28.2 Results that could contribute to European or international standards — Information on EU funding

If results are incorporated in a standard, the beneficiary concerned must — unless the Agency requests or agrees otherwise or unless it is impossible — ask the standardisation body to include the following statement in (information related to) the standard:

> *"Results incorporated in this standard received funding from the* European Union's Horizon 2020 research and innovation programme *under grant agreement No 769608".*

28.3 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced in accordance with Article 43.

Such a breach may also lead to any of the other measures described in Chapter 6.

ARTICLE 29 — DISSEMINATION OF RESULTS — OPEN ACCESS — VISIBILITY OF EU FUNDING

29.1 Obligation to disseminate results

Unless it goes against their legitimate interests, each beneficiary must — as soon as possible — '**disseminate**' its results by disclosing them to the public by appropriate means (other than those resulting from protecting or exploiting the results), including in scientific publications (in any medium).

This does not change the obligation to protect results in Article 27, the confidentiality obligations in Article 36, the security obligations in Article 37 or the obligations to protect personal data in Article 39, all of which still apply.

A beneficiary that intends to disseminate its results must give advance notice to the other beneficiaries of — unless agreed otherwise — at least 45 days, together with sufficient information on the results it will disseminate.

Any other beneficiary may object within — unless agreed otherwise — 30 days of receiving notification, if it can show that its legitimate interests in relation to the results or background would be significantly harmed. In such cases, the dissemination may not take place unless appropriate steps are taken to safeguard these legitimate interests.

If a beneficiary intends not to protect its results, it may — under certain conditions (see Article 26.4.1) — need to formally notify the Agency before dissemination takes place.

29.2 Open access to scientific publications

Each beneficiary must ensure open access (free of charge online access for any user) to all peer-reviewed scientific publications relating to its results.

In particular, it must:

(a) as soon as possible and at the latest on publication, deposit a machine-readable electronic copy of the published version or final peer-reviewed manuscript accepted for publication in a repository for scientific publications;

Moreover, the beneficiary must aim to deposit at the same time the research data needed to validate the results presented in the deposited scientific publications.

(b) ensure open access to the deposited publication — via the repository — at the latest:

(i) on publication, if an electronic version is available for free via the publisher, or

(ii) within six months of publication (twelve months for publications in the social sciences and humanities) in any other case.

(c) ensure open access — via the repository — to the bibliographic metadata that identify the deposited publication.

The bibliographic metadata must be in a standard format and must include all of the following:

- the terms “European Union (EU)” and “Horizon 2020”;
- the name of the action, acronym and grant number;
- the publication date, and length of embargo period if applicable, and
- a persistent identifier.

29.3 Open access to research data

Regarding the digital research data generated in the action (‘**data**’), the beneficiaries must:

(a) deposit in a research data repository and take measures to make it possible for third parties to access, mine, exploit, reproduce and disseminate — free of charge for any user — the following:

(i) the data, including associated metadata, needed to validate the results presented in scientific publications as soon as possible;

(ii) other data, including associated metadata, as specified and within the deadlines laid down in the 'data management plan' (see Annex 1);

(b) provide information — via the repository — about tools and instruments at the disposal of the beneficiaries and necessary for validating the results (and — where possible — provide the tools and instruments themselves).

This does not change the obligation to protect results in Article 27, the confidentiality obligations in Article 36, the security obligations in Article 37 or the obligations to protect personal data in Article 39, all of which still apply.

As an exception, the beneficiaries do not have to ensure open access to specific parts of their research data if the achievement of the action's main objective, as described in Annex 1, would be jeopardised by making those specific parts of the research data openly accessible. In this case, the data management plan must contain the reasons for not giving access.

29.4 Information on EU funding — Obligation and right to use the EU emblem

Unless the Agency requests or agrees otherwise or unless it is impossible, any dissemination of results (in any form, including electronic) must:

(a) display the EU emblem and

(b) include the following text:

"This project has received funding from the European Union's Horizon 2020 research and innovation programme *under grant agreement No 769608".*

When displayed together with another logo, the EU emblem must have appropriate prominence.

For the purposes of their obligations under this Article, the beneficiaries may use the EU emblem without first obtaining approval from the Agency.

This does not however give them the right to exclusive use.

Moreover, they may not appropriate the EU emblem or any similar trademark or logo, either by registration or by any other means.

29.5 Disclaimer excluding Agency responsibility

Any dissemination of results must indicate that it reflects only the author's view and that the Agency is not responsible for any use that may be made of the information it contains.

29.6 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such a breach may also lead to any of the other measures described in Chapter 6.

ARTICLE 30 — TRANSFER AND LICENSING OF RESULTS

30.1 Transfer of ownership

Each beneficiary may transfer ownership of its results.

It must however ensure that its obligations under Articles 26.2, 26.4, 27, 28, 29, 30 and 31 also apply to the new owner and that this owner has the obligation to pass them on in any subsequent transfer.

This does not change the security obligations in Article 37, which still apply.

Unless agreed otherwise (in writing) for specifically-identified third parties or unless impossible under applicable EU and national laws on mergers and acquisitions, a beneficiary that intends to transfer ownership of results must give at least 45 days advance notice (or less if agreed in writing) to the other beneficiaries that still have (or still may request) access rights to the results. This notification must include sufficient information on the new owner to enable any beneficiary concerned to assess the effects on its access rights.

Unless agreed otherwise (in writing) for specifically-identified third parties, any other beneficiary may object within 30 days of receiving notification (or less if agreed in writing), if it can show that the transfer would adversely affect its access rights. In this case, the transfer may not take place until agreement has been reached between the beneficiaries concerned.

30.2 Granting licenses

Each beneficiary may grant licences to its results (or otherwise give the right to exploit them), if:

(a) this does not impede the access rights under Article 31 and

(b) not applicable.

In addition to Points (a) and (b), exclusive licences for results may be granted only if all the other beneficiaries concerned have waived their access rights (see Article 31.1).

This does not change the dissemination obligations in Article 29 or security obligations in Article 37, which still apply.

30.3 Agency right to object to transfers or licensing

Not applicable

30.4 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such a breach may also lead to any of the other measures described in Chapter 6.

ARTICLE 31 — ACCESS RIGHTS TO RESULTS

31.1 Exercise of access rights — Waiving of access rights — No sub-licensing

The conditions set out in Article 25.1 apply.

The obligations set out in this Article do not change the security obligations in Article 37, which still apply.

31.2 Access rights for other beneficiaries, for implementing their own tasks under the action

The beneficiaries must give each other access — on a royalty-free basis — to results needed for implementing their own tasks under the action.

31.3 Access rights for other beneficiaries, for exploiting their own results

The beneficiaries must give each other — under fair and reasonable conditions (see Article 25.3) — access to results needed for exploiting their own results.

Requests for access may be made — unless agreed otherwise — up to one year after the period set out in Article 3.

31.4 Access rights of affiliated entities

Unless agreed otherwise in the consortium agreement, access to results must also be given — under fair and reasonable conditions (Article 25.3) — to affiliated entities established in an EU Member State or associated country, if this is needed for those entities to exploit the results generated by the beneficiaries to which they are affiliated.

Unless agreed otherwise (see above; Article 31.1), the affiliated entity concerned must make any such request directly to the beneficiary that owns the results.

Requests for access may be made — unless agreed otherwise — up to one year after the period set out in Article 3.

31.5 Access rights for the EU institutions, bodies, offices or agencies and EU Member States

The beneficiaries must give access to their results — on a royalty-free basis — to EU institutions, bodies, offices or agencies, for developing, implementing or monitoring EU policies or programmes.

Such access rights are limited to non-commercial and non-competitive use.

This does not change the right to use any material, document or information received from the beneficiaries for communication and publicising activities (see Article 38.2).

31.6 Access rights for third parties

Not applicable

31.7 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

SECTION 4 OTHER RIGHTS AND OBLIGATIONS

ARTICLE 32 — RECRUITMENT AND WORKING CONDITIONS FOR RESEARCHERS

32.1 Obligation to take measures to implement the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers

The beneficiaries must take all measures to implement the principles set out in the Commission Recommendation on the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers[21], in particular regarding:

- working conditions;
- transparent recruitment processes based on merit, and
- career development.

The beneficiaries must ensure that researchers and third parties involved in the action are aware of them.

32.2 Consequences of non-compliance

If a beneficiary breaches its obligations under this Article, the Agency may apply any of the measures described in Chapter 6.

ARTICLE 33 — GENDER EQUALITY

33.1 Obligation to aim for gender equality

The beneficiaries must take all measures to promote equal opportunities between men and women in the implementation of the action. They must aim, to the extent possible, for a gender balance at all levels of personnel assigned to the action, including at supervisory and managerial level.

33.2 Consequences of non-compliance

If a beneficiary breaches its obligations under this Article, the Agency may apply any of the measures described in Chapter 6.

ARTICLE 34 — ETHICS AND RESEARCH INTEGRITY

34.1 Obligation to comply with ethical and research integrity principles

The beneficiaries must carry out the action in compliance with:

(a) ethical principles (including the highest standards of research integrity)

[21] Commission Recommendation 2005/251/EC of 11 March 2005 on the European Charter for Researchers and on a Code of Conduct for the Recruitment of Researchers (OJ L 75, 22.3.2005, p. 67).

and

(b) applicable international, EU and national law.

Funding will not be granted for activities carried out outside the EU if they are prohibited in all Member States or for activities which destroy human embryos (for example, for obtaining stem cells).

The beneficiaries must ensure that the activities under the action have an exclusive focus on civil applications.

The beneficiaries must ensure that the activities under the action do not:

(a) aim at human cloning for reproductive purposes;

(b) intend to modify the genetic heritage of human beings which could make such changes heritable (with the exception of research relating to cancer treatment of the gonads, which may be financed), or

(c) intend to create human embryos solely for the purpose of research or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer.

The beneficiaries must respect the highest standards of research integrity — as set out, for instance, in the European Code of Conduct for Research Integrity[22].

This implies notably compliance with the following essential principles:

- honesty;
- reliability;
- objectivity;
- impartiality;
- open communication;
- duty of care;
- fairness and
- responsibility for future science generations.

This means that beneficiaries must ensure that persons carrying out research tasks:

- present their research goals and intentions in an honest and transparent manner;
- design their research carefully and conduct it in a reliable fashion, taking its impact on society into account;

[22] The European Code of Conduct for Research Integrity of ALLEA (All European Academies) and ESF (European Science Foundation) of March 2011.
http://ec.europa.eu/research/participants/data/ref/h2020/other/hi/h2020-ethics_code-of-conduct_en.pdf

- use techniques and methodologies (including for data collection and management) that are appropriate for the field(s) concerned;

- exercise due care for the subjects of research — be they human beings, animals, the environment or cultural objects;

- ensure objectivity, accuracy and impartiality when disseminating the results;

- allow — in addition to the open access obligations under Article 29.3 as much as possible and taking into account the legitimate interest of the beneficiaries — access to research data, in order to enable research to be reproduced;

- make the necessary references to their work and that of other researchers;

- refrain from practicing any form of plagiarism, data falsification or fabrication;

- avoid double funding, conflicts of interest and misrepresentation of credentials or other research misconduct.

34.2 Activities raising ethical issues

Activities raising ethical issues must comply with the '**ethics requirements**' set out as deliverables in Annex 1.

Before the beginning of an activity raising an ethical issue, each beneficiary must have obtained:

(a) any ethics committee opinion required under national law and

(b) any notification or authorisation for activities raising ethical issues required under national and/or European law

needed for implementing the action tasks in question.

The documents must be kept on file and be submitted upon request by the coordinator to the Agency (see Article 52). If they are not in English, they must be submitted together with an English summary, which shows that the action tasks in question are covered and includes the conclusions of the committee or authority concerned (if available).

34.3 Activities involving human embryos or human embryonic stem cells

Activities involving research on human embryos or human embryonic stem cells may be carried out, in addition to Article 34.1, only if:

- they are set out in Annex 1 or

- the coordinator has obtained explicit approval (in writing) from the Agency (see Article 52).

34.4 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43) and the Agreement or participation of the beneficiary may be terminated (see Article 50).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 35 — CONFLICT OF INTERESTS

35.1 Obligation to avoid a conflict of interests

The beneficiaries must take all measures to prevent any situation where the impartial and objective implementation of the action is compromised for reasons involving economic interest, political or national affinity, family or emotional ties or any other shared interest ('**conflict of interests**').

They must formally notify to the Agency without delay any situation constituting or likely to lead to a conflict of interests and immediately take all the necessary steps to rectify this situation.

The Agency may verify that the measures taken are appropriate and may require additional measures to be taken by a specified deadline.

35.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43) and the Agreement or participation of the beneficiary may be terminated (see Article 50).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 36 — CONFIDENTIALITY

36.1 General obligation to maintain confidentiality

During implementation of the action and for four years after the period set out in Article 3, the parties must keep confidential any data, documents or other material (in any form) that is identified as confidential at the time it is disclosed ('**confidential information**').

If a beneficiary requests, the Agency may agree to keep such information confidential for an additional period beyond the initial four years.

If information has been identified as confidential only orally, it will be considered to be confidential only if this is confirmed in writing within 15 days of the oral disclosure.

Unless otherwise agreed between the parties, they may use confidential information only to implement the Agreement.

The beneficiaries may disclose confidential information to their personnel or third parties involved in the action only if they:

(a) need to know to implement the Agreement and

(b) are bound by an obligation of confidentiality.

This does not change the security obligations in Article 37, which still apply.

The Agency may disclose confidential information to its staff, other EU institutions and bodies. It may disclose confidential information to third parties, if:

(a) this is necessary to implement the Agreement or safeguard the EU's financial interests and

(b) the recipients of the information are bound by an obligation of confidentiality.

Under the conditions set out in Article 4 of the Rules for Participation Regulation No 1290/2013 [23], the Commission must moreover make available information on the results to other EU institutions, bodies, offices or agencies as well as Member States or associated countries.

The confidentiality obligations no longer apply if:

(a) the disclosing party agrees to release the other party;

(b) the information was already known by the recipient or is given to him without obligation of confidentiality by a third party that was not bound by any obligation of confidentiality;

(c) the recipient proves that the information was developed without the use of confidential information;

(d) the information becomes generally and publicly available, without breaching any confidentiality obligation, or

(e) the disclosure of the information is required by EU or national law.

36.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 37 — SECURITY-RELATED OBLIGATIONS

37.1 Results with a security recommendation

Not applicable

37.2 Classified information

Not applicable

37.3 Activities involving dual-use goods or dangerous materials and substances

Not applicable

37.4 Consequences of non-compliance

Not applicable

ARTICLE 38 — PROMOTING THE ACTION — VISIBILITY OF EU FUNDING

[23] 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)" (OJ L 347, 20.12.2013 p.81).

38.1 Communication activities by beneficiaries

38.1.1 Obligation to promote the action and its results

The beneficiaries must promote the action and its results, by providing targeted information to multiple audiences (including the media and the public) in a strategic and effective manner.

This does not change the dissemination obligations in Article 29, the confidentiality obligations in Article 36 or the security obligations in Article 37, all of which still apply.

Before engaging in a communication activity expected to have a major media impact, the beneficiaries must inform the Agency (see Article 52).

38.1.2 Information on EU funding — Obligation and right to use the EU emblem

Unless the Agency requests or agrees otherwise or unless it is impossible, any communication activity related to the action (including in electronic form, via social media, etc.) and any infrastructure, equipment and major results funded by the grant must:

(a) display the EU emblem and

(b) include the following text:

For communication activities: *"This project has received funding from the* European Union's Horizon 2020 research and innovation programme *under grant agreement No 769608".*

For infrastructure, equipment and major results: *"This [infrastructure][equipment][insert type of result] is part of a project that has received funding from the* European Union's Horizon 2020 research and innovation programme *under grant agreement No 769608".*

When displayed together with another logo, the EU emblem must have appropriate prominence.

For the purposes of their obligations under this Article, the beneficiaries may use the EU emblem without first obtaining approval from the Agency.

This does not, however, give them the right to exclusive use.

Moreover, they may not appropriate the EU emblem or any similar trademark or logo, either by registration or by any other means.

38.1.3 Disclaimer excluding Agency and Commission responsibility

Any communication activity related to the action must indicate that it reflects only the author's view and that the Agency and the Commission are not responsible for any use that may be made of the information it contains.

38.2 Communication activities by the Agency and the Commission

38.2.1 Right to use beneficiaries' materials, documents or information

The Agency and the Commission may use, for its communication and publicising activities, information relating to the action, documents notably summaries for publication and public deliverables as well as any other material, such as pictures or audio-visual material received from any beneficiary (including in electronic form).

This does not change the confidentiality obligations in Article 36 and the security obligations in Article 37, all of which still apply.

If the Agency's or the Commission's use of these materials, documents or information would risk compromising legitimate interests, the beneficiary concerned may request the Agency or the Commission not to use it (see Article 52).

The right to use a beneficiary's materials, documents and information includes:

(a) **use for its own purposes** (in particular, making them available to persons working for the Agency, the Commission or any other EU institution, body, office or agency or body or institutions in EU Member States; and copying or reproducing them in whole or in part, in unlimited numbers);

(b) **distribution to the public** (in particular, publication as hard copies and in electronic or digital format, publication on the internet, as a downloadable or non-downloadable file, broadcasting by any channel, public display or presentation, communicating through press information services, or inclusion in widely accessible databases or indexes);

(c) **editing or redrafting** for communication and publicising activities (including shortening, summarising, inserting other elements (such as meta-data, legends, other graphic, visual, audio or text elements), extracting parts (e.g. audio or video files), dividing into parts, use in a compilation);

(d) **translation**;

(e) giving **access in response to individual requests** under Regulation No 1049/2001 [25], without the right to reproduce or exploit;

(f) **storage** in paper, electronic or other form;

(g) **archiving**, in line with applicable document-management rules, and

(h) the right to authorise **third parties** to act on its behalf or sub-license the modes of use set out in Points (b), (c), (d) and (f) to third parties if needed for the communication and publicising activities of the Agency or the Commission.

If the right of use is subject to rights of a third party (including personnel of the beneficiary), the beneficiary must ensure that it complies with its obligations under this Agreement (in particular, by obtaining the necessary approval from the third parties concerned).

Where applicable (and if provided by the beneficiaries), the Agency or the Commission will insert the following information:

> "© – [year] – [name of the copyright owner]. All rights reserved. Licensed to the Research Executive Agency (REA) and the European Union (EU) under conditions."

38.3 Consequences of non-compliance

[25] Regulation (EC) No 1049/2001 of the European Parliament and of the Council of 30 May 2001 regarding public access to European Parliament, Council and Commission documents, OJ L 145, 31.5.2001, p. 43.

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 39 — PROCESSING OF PERSONAL DATA

39.1 Processing of personal data by the Agency and the Commission

Any personal data under the Agreement will be processed by the Agency or the Commission under Regulation No 45/2001[26] and according to the 'notifications of the processing operations' to the Data Protection Officer (DPO) of the Agency or the Commission (publicly accessible in the DPO register).

Such data will be processed by the '**data controller**' of the Agency or the Commission for the purposes of implementing, managing and monitoring the Agreement or protecting the financial interests of the EU or Euratom (including checks, reviews, audits and investigations; see Article 22).

The persons whose personal data are processed have the right to access and correct their own personal data. For this purpose, they must send any queries about the processing of their personal data to the data controller, via the contact point indicated in the privacy statement(s) that are published on the Agency and the Commission websites.

They also have the right to have recourse at any time to the European Data Protection Supervisor (EDPS).

39.2 Processing of personal data by the beneficiaries

The beneficiaries must process personal data under the Agreement in compliance with applicable EU and national law on data protection (including authorisations or notification requirements).

The beneficiaries may grant their personnel access only to data that is strictly necessary for implementing, managing and monitoring the Agreement.

The beneficiaries must inform the personnel whose personal data are collected and processed by the Agency or the Commission. For this purpose, they must provide them with the privacy statement(s) (see above), before transmitting their data to the Agency or the Commission.

39.3 Consequences of non-compliance

If a beneficiary breaches any of its obligations under Article 39.2, the Agency may apply any of the measures described in Chapter 6.

ARTICLE 40 — ASSIGNMENTS OF CLAIMS FOR PAYMENT AGAINST THE AGENCY

The beneficiaries may not assign any of their claims for payment against the Agency to any third party, except if approved by the Agency on the basis of a reasoned, written request by the coordinator (on behalf of the beneficiary concerned).

[26] Regulation (EC) No 45/2001 of the European Parliament and of the Council of 18 December 2000 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 (OJ L 8, 12.01.2001, p. 1).

If the Agency has not accepted the assignment or the terms of it are not observed, the assignment will have no effect on it.

In no circumstances will an assignment release the beneficiaries from their obligations towards the Agency.

CHAPTER 5 DIVISION OF BENEFICIARIES' ROLES AND RESPONSIBILITIES — RELATIONSHIP WITH COMPLEMENTARY BENEFICIARIES — RELATIONSHIP WITH PARTNERS OF A JOINT ACTION

ARTICLE 41 — DIVISION OF BENEFICIARIES' ROLES AND RESPONSIBILITIES — RELATIONSHIP WITH COMPLEMENTARY BENEFICIARIES — RELATIONSHIP WITH PARTNERS OF A JOINT ACTION

41.1 Roles and responsibility towards the Agency

The beneficiaries have full responsibility for implementing the action and complying with the Agreement.

The beneficiaries are jointly and severally liable for the **technical implementation** of the action as described in Annex 1. If a beneficiary fails to implement its part of the action, the other beneficiaries become responsible for implementing this part (without being entitled to any additional EU funding for doing so), unless the Agency expressly relieves them of this obligation.

The **financial responsibility** of each beneficiary is governed by Articles 44, 45 and 46.

41.2 Internal division of roles and responsibilities

The internal roles and responsibilities of the beneficiaries are divided as follows:

(a) Each **beneficiary** must:

(i) keep information stored in the Participant Portal Beneficiary Register (via the electronic exchange system) up to date (see Article 17);

(ii) inform the coordinator immediately of any events or circumstances likely to affect significantly or delay the implementation of the action (see Article 17);

(iii) submit to the coordinator in good time:

- individual financial statements for itself and its linked third parties and, if required, certificates on the financial statements (see Article 20);
- the data needed to draw up the technical reports (see Article 20);
- ethics committee opinions and notifications or authorisations for activities raising ethical issues (see Article 34);
- any other documents or information required by the Agency or the Commission under the Agreement, unless the Agreement requires the beneficiary to submit this information directly to the Agency or the Commission.

(b) The **coordinator** must:

(i) monitor that the action is implemented properly (see Article 7);

(ii) act as the intermediary for all communications between the beneficiaries and the Agency (in particular, providing the Agency with the information described in Article 17), unless the Agreement specifies otherwise;

(iii) request and review any documents or information required by the Agency and verify their completeness and correctness before passing them on to the Agency;

(iv) submit the deliverables and reports to the Agency (see Articles 19 and 20);

(v) ensure that all payments are made to the other beneficiaries without unjustified delay (see Article 21);

(vi) inform the Agency of the amounts paid to each beneficiary, when required under the Agreement (see Articles 44 and 50) or requested by the Agency.

The coordinator may not delegate or subcontract the above-mentioned tasks to any other beneficiary or third party (including linked third parties).

As an exception, the coordinator delegates the tasks set out in Point 2(b)(v) and (vi) above to EIGEN VERMOGEN INFORMATIE VLAANDEREN. The coordinator retains sole responsibility for the EU contribution and for compliance with the obligations under the Agreement.

41.3 Internal arrangements between beneficiaries — Consortium agreement

The beneficiaries must have internal arrangements regarding their operation and co-ordination to ensure that the action is implemented properly. These internal arrangements must be set out in a written '**consortium agreement**' between the beneficiaries, which may cover:

- internal organisation of the consortium;
- management of access to the electronic exchange system;
- distribution of EU funding;
- additional rules on rights and obligations related to background and results (including whether access rights remain or not, if a beneficiary is in breach of its obligations) (see Section 3 of Chapter 4);
- settlement of internal disputes;
- liability, indemnification and confidentiality arrangements between the beneficiaries.

The consortium agreement must not contain any provision contrary to the Agreement.

41.4 Relationship with complementary beneficiaries — Collaboration agreement

Not applicable

41.5 Relationship with partners of a joint action — Coordination agreement

Not applicable

CHAPTER 6 REJECTION OF COSTS — REDUCTION OF THE GRANT — RECOVERY — SANCTIONS — DAMAGES — SUSPENSION — TERMINATION — FORCE MAJEURE

SECTION 1 REJECTION OF COSTS — REDUCTION OF THE GRANT — RECOVERY — SANCTIONS

ARTICLE 42 — REJECTION OF INELIGIBLE COSTS

42.1 Conditions

The Agency will — after **termination of the participation of a beneficiary**, at the time of an **interim payment**, **at the payment of the balance** or **afterwards** — reject any costs which are ineligible (see Article 6), in particular following checks, reviews, audits or investigations (see Article 22).

The rejection may also be based on the **extension of findings from other grants to this grant** (see Article 22.5.2).

42.2 Ineligible costs to be rejected — Calculation — Procedure

Ineligible costs will be rejected in full.

If the rejection of costs does not lead to a recovery (see Article 44), the Agency will formally notify the coordinator or beneficiary concerned of the rejection of costs, the amounts and the reasons why (if applicable, together with the notification of amounts due; see Article 21.5). The coordinator or beneficiary concerned may — within 30 days of receiving notification — formally notify the Agency of its disagreement and the reasons why.

If the rejection of costs leads to a recovery, the Agency will follow the contradictory procedure with pre-information letter set out in Article 44.

42.3 Effects

If the Agency rejects costs at the time of an **interim payment** or **the payment of the balance**, it will deduct them from the total eligible costs declared, for the action, in the periodic or final summary financial statement (see Articles 20.3 and 20.4). It will then calculate the interim payment or payment of the balance as set out in Articles 21.3 or 21.4.

If the Agency rejects costs **after termination of the participation of a beneficiary**, it will deduct them from the costs declared by the beneficiary in the termination report and include the rejection in the calculation after termination (see Article 50.2 and 50.3).

If the Agency — **after an interim payment but before the payment of the balance** — rejects costs declared in a periodic summary financial statement, it will deduct them from the total eligible costs declared, for the action, in the next periodic summary financial statement or in the final summary

financial statement. It will then calculate the interim payment or payment of the balance as set out in Articles 21.3 or 21.4.

If the Agency rejects costs **after the payment of the balance**, it will deduct the amount rejected from the total eligible costs declared, by the beneficiary, in the final summary financial statement. It will then calculate the revised final grant amount as set out in Article 5.4.

ARTICLE 43 — REDUCTION OF THE GRANT

43.1 Conditions

The Agency may — **after termination of the participation of a beneficiary**, **at the payment of the balance** or **afterwards** — reduce the grant amount (see Article 5.1), if :

(a) a beneficiary (or a natural person who has the power to represent or take decisions on its behalf) has committed:

(i) substantial errors, irregularities or fraud or

(ii) serious breach of obligations under the Agreement or during the award procedure (including improper implementation of the action, submission of false information, failure to provide required information, breach of ethical principles) or

(b) a beneficiary (or a natural person who has the power to represent or take decision on its behalf) has committed — in other EU or Euratom grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant (**extension of findings from other grants to this grant**; see Article 22.5.2).

43.2 Amount to be reduced — Calculation — Procedure

The amount of the reduction will be proportionate to the seriousness of the errors, irregularities or fraud or breach of obligations.

Before reduction of the grant, the Agency will formally notify a '**pre-information letter**' to the coordinator or beneficiary concerned:

- informing it of its intention to reduce the grant, the amount it intends to reduce and the reasons why and

- inviting it to submit observations within 30 days of receiving notification

If the Agency does not receive any observations or decides to pursue reduction despite the observations it has received, it will formally notify **confirmation** of the reduction (if applicable, together with the notification of amounts due; see Article 21).

43.3 Effects

If the Agency reduces the grant **after termination of the participation of a beneficiary**, it will calculate the reduced grant amount for that beneficiary and then determine the amount due to that beneficiary (see Article 50.2 and 50.3).

If the Agency reduces the grant **at the payment of the balance**, it will calculate the reduced grant amount for the action and then determine the amount due as payment of the balance (see Articles 5.3.4 and 21.4).

If the Agency reduces the grant **after the payment of the balance**, it will calculate the revised final grant amount for the beneficiary concerned (see Article 5.4). If the revised final grant amount for the beneficiary concerned is lower than its share of the final grant amount, the Agency will recover the difference (see Article 44).

ARTICLE 44 — RECOVERY OF UNDUE AMOUNTS

44.1 Amount to be recovered — Calculation — Procedure

The Agency will — after **termination of the participation of a beneficiary, at the payment of the balance** or **afterwards** — claim back any amount that was paid, but is not due under the Agreement.

Each beneficiary's financial responsibility in case of recovery is limited to its own debt (including undue amounts paid by the Agency for costs declared by its linked third parties), except for the amount retained for the Guarantee Fund (see Article 21.4).

44.1.1 Recovery after termination of a beneficiary's participation

If recovery takes place after termination of a beneficiary's participation (including the coordinator), the Agency will claim back the undue amount from the beneficiary concerned, by formally notifying it a debit note (see Article 50.2 and 50.3). This note will specify the amount to be recovered, the terms and the date for payment.

If payment is not made by the date specified in the debit note, the Agency or the Commission will **recover** the amount:

(a) by '**offsetting**' it — without the beneficiary's consent — against any amounts owed to the beneficiary concerned by the Agency, the Commission or another executive agency (from the EU or Euratom budget).

In exceptional circumstances, to safeguard the EU's financial interests, the Agency may offset before the payment date specified in the debit note;

(b) not applicable;

(c) by **taking legal action** (see Article 57) or by **adopting an enforceable decision** under Article 299 of the Treaty on the Functioning of the EU (TFEU) and Article 79(2) of the Financial regulation No 966/2012.

If payment is not made by the date specified in the debit note, the amount to be recovered (see above) will be increased by **late-payment interest** at the rate set out in Article 21.11, from the day following the payment date in the debit note, up to and including the date the Agency or the Commission receives full payment of the amount.

Partial payments will be first credited against expenses, charges and late-payment interest and then against the principal.

Bank charges incurred in the recovery process will be borne by the beneficiary, unless Directive 2007/64/EC[27] applies.

44.1.2 Recovery at payment of the balance

If the payment of the balance takes the form of a recovery (see Article 21.4), the Agency will formally notify a '**pre-information letter**' to the coordinator:

- informing it of its intention to recover, the amount due as the balance and the reasons why;
- specifying that it intends to deduct the amount to be recovered from the amount retained for the Guarantee Fund;
- requesting the coordinator to submit a report on the distribution of payments to the beneficiaries within 30 days of receiving notification, and
- inviting the coordinator to submit observations within 30 days of receiving notification.

If no observations are submitted or the Agency decides to pursue recovery despite the observations it has received, it will **confirm recovery** (together with the notification of amounts due; see Article 21.5) and:

- pay the difference between the amount to be recovered and the amount retained for the Guarantee Fund, **if the difference is positive** or
- formally notify to the coordinator a **debit note** for the difference between the amount to be recovered and the amount retained for the Guarantee Fund, **if the difference is negative**. This note will also specify the terms and the date for payment.

If the coordinator does not repay the Agency by the date in the debit note and has not submitted the report on the distribution of payments: the Agency or the Commission will **recover** the amount set out in the debit note from the coordinator (see below).

If the coordinator does not repay the Agency by the date in the debit note, but has submitted the report on the distribution of payments: the Agency will:

(a) identify the beneficiaries for which the amount calculated as follows is negative:

{{{ {beneficiary's costs declared in the final summary financial statement and approved by the Agency multiplied by the reimbursement rate set out in Article 5.2 for the beneficiary concerned

plus

its linked third parties' costs declared in the final summary financial statement and approved by the Agency multiplied by the reimbursement rate set out in Article 5.2 for each linked third party concerned}

divided by

the EU contribution for the action calculated according to Article 5.3.1}

multiplied by

[27] Directive 2007/64/EC of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC (OJ L 319, 05.12.2007, p. 1).

the final grant amount (see Article 5.3)}**,**

minus

{pre-financing and interim payments received by the beneficiary}**}**.

(b) formally notify to each beneficiary identified according to point (a) a **debit note** specifying the terms and date for payment. The amount of the debit note is calculated as follows:

{{amount calculated according to point (a) for the beneficiary concerned

divided by

the sum of the amounts calculated according to point (a) for all the beneficiaries identified according to point (a)}

multiplied by

the amount set out in the debit note formally notified to the coordinator}.

If payment is not made by the date specified in the debit note, the Agency will **recover** the amount:

(a) by '**offsetting**' it — without the beneficiary's consent — against any amounts owed to the beneficiary concerned by the Agency, the Commission or another executive agency (from the EU or Euratom budget).

In exceptional circumstances, to safeguard the EU's financial interests, the Agency may offset before the payment date specified in the debit note;

(b) by **drawing on the Guarantee Fund**. The Agency or the Commission will formally notify the beneficiary concerned the debit note on behalf of the Guarantee Fund and recover the amount:

(i) not applicable;

(ii) by **taking legal action** (see Article 57) or by **adopting an enforceable decision** under Article 299 of the Treaty on the Functioning of the EU (TFEU) and Article 79(2) of the Financial Regulation No 966/2012.

If payment is not made by the date in the debit note, the amount to be recovered (see above) will be increased by **late-payment interest** at the rate set out in Article 21.11, from the day following the payment date in the debit note, up to and including the date the Agency or the Commission receives full payment of the amount.

Partial payments will be first credited against expenses, charges and late-payment interest and then against the principal.

Bank charges incurred in the recovery process will be borne by the beneficiary, unless Directive 2007/64/EC applies.

44.1.3 Recovery of amounts after payment of the balance

If, for a beneficiary, the revised final grant amount (see Article 5.4) is lower than its share of the final grant amount, it must repay the difference to the Agency.

The beneficiary's share of the final grant amount is calculated as follows:

{{{beneficiary's costs declared in the final summary financial statement and approved by the Agency multiplied by the reimbursement rate set out in Article 5.2 for the beneficiary concerned

plus

its linked third parties' costs declared in the final summary financial statement and approved by the Agency multiplied by the reimbursement rate set out in Article 5.2 for each linked third party concerned}

divided by

the EU contribution for the action calculated according to Article 5.3.1}

multiplied by

the final grant amount (see Article 5.3)}.

If the coordinator has not distributed amounts received (see Article 21.7), the Agency will also recover these amounts.

The Agency will formally notify a **pre-information letter** to the beneficiary concerned:

- informing it of its intention to recover, the due amount and the reasons why and
- inviting it to submit observations within 30 days of receiving notification.

If no observations are submitted or the Agency decides to pursue recovery despite the observations it has received, it will **confirm** the amount to be recovered and formally notify to the beneficiary concerned a **debit note**. This note will also specify the terms and the date for payment.

If payment is not made by the date specified in the debit note, the Agency will **recover** the amount:

(a) by '**offsetting**' it — without the beneficiary's consent — against any amounts owed to the beneficiary concerned by the Agency, the Commission or another executive agency (from the EU or Euratom budget).

In exceptional circumstances, to safeguard the EU's financial interests, the Agency may offset before the payment date specified in the debit note;

(b) by **drawing on the Guarantee Fund**. The Agency or the Commission will formally notify the beneficiary concerned the debit note on behalf of the Guarantee Fund and recover the amount:

(i) not applicable;

(ii) by **taking legal action** (see Article 57) or by **adopting an enforceable decision** under Article 299 of the Treaty on the Functioning of the EU (TFEU) and Article 79(2) of the Financial Regulation No 966/2012.

If payment is not made by the date in the debit note, the amount to be recovered (see above) will be increased by **late-payment interest** at the rate set out in Article 21.11, from the day following the date for payment in the debit note, up to and including the date the Agency or the Commission receives full payment of the amount.

Partial payments will be first credited against expenses, charges and late-payment interest and then against the principal.

Bank charges incurred in the recovery process will be borne by the beneficiary, unless Directive 2007/64/EC applies.

ARTICLE 45 — ADMINISTRATIVE SANCTIONS

In addition to contractual measures, the Agency or the Commission may also adopt administrative sanctions under Articles 106 and 131(4) of the Financial Regulation No 966/2012 (i.e. exclusion from future procurement contracts, grants and expert contracts and/or financial penalties).

SECTION 2 LIABILITY FOR DAMAGES

ARTICLE 46 — LIABILITY FOR DAMAGES

46.1 Liability of the Agency

The Agency cannot be held liable for any damage caused to the beneficiaries or to third parties as a consequence of implementing the Agreement, including for gross negligence.

The Agency cannot be held liable for any damage caused by any of the beneficiaries or third parties involved in the action, as a consequence of implementing the Agreement.

46.2 Liability of the beneficiaries

Except in case of force majeure (see Article 51), the beneficiaries must compensate the Agency for any damage it sustains as a result of the implementation of the action or because the action was not implemented in full compliance with the Agreement.

SECTION 3 SUSPENSION AND TERMINATION

ARTICLE 47 — SUSPENSION OF PAYMENT DEADLINE

47.1 Conditions

The Agency may — at any moment — suspend the payment deadline (see Article 21.2 to 21.4) if a request for payment (see Article 20) cannot be approved because:

(a) it does not comply with the provisions of the Agreement (see Article 20);

(b) the technical or financial reports have not been submitted or are not complete or additional information is needed, or

(c) there is doubt about the eligibility of the costs declared in the financial statements and additional checks, reviews, audits or investigations are necessary.

47.2 Procedure

The Agency will formally notify the coordinator of the suspension and the reasons why.

The suspension will **take effect** the day notification is sent by the Agency (see Article 52).

If the conditions for suspending the payment deadline are no longer met, the suspension will be **lifted** — and the remaining period will resume.

If the suspension exceeds two months, the coordinator may request the Agency if the suspension will continue.

If the payment deadline has been suspended due to the non-compliance of the technical or financial reports (see Article 20) and the revised report or statement is not submitted or was submitted but is also rejected, the Agency may also terminate the Agreement or the participation of the beneficiary (see Article 50.3.1(l)).

ARTICLE 48 — SUSPENSION OF PAYMENTS

48.1 Conditions

The Agency may — at any moment — suspend payments, in whole or in part and for one or more beneficiaries, if:

(a) a beneficiary (or a natural person who has the power to represent or take decision on its behalf) has committed or is suspected of having committed:

(i) substantial errors, irregularities or fraud or

(ii) serious breach of obligations under the Agreement or during the award procedure (including improper implementation of the action, submission of false information, failure to provide required information, breach of ethical principles) or

(b) a beneficiary (or a natural person who has the power to represent or take decision on its behalf) has committed — in other EU or Euratom grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant (**extension of findings from other grants to this grant**; see Article 22.5.2).

If payments are suspended for one or more beneficiaries, the Agency will make partial payment(s) for the part(s) not suspended. If suspension concerns the payment of the balance, — once suspension is lifted — the payment or the recovery of the amount(s) concerned will be considered the payment of the balance that closes the action.

48.2 Procedure

Before suspending payments, the Agency will formally notify the coordinator or beneficiary concerned:

- informing it of its intention to suspend payments and the reasons why and
- inviting it to submit observations within 30 days of receiving notification.

If the Agency does not receive observations or decides to pursue the procedure despite the observations it has received, it will formally notify **confirmation** of the suspension. Otherwise, it will formally notify that the suspension procedure is not continued.

The suspension will **take effect** the day the confirmation notification is sent by the Agency.

If the conditions for resuming payments are met, the suspension will be **lifted**. The Agency will formally notify the coordinator or beneficiary concerned.

During the suspension, the periodic report(s) for all reporting periods except the last one (see Article 20.3), must not contain any individual financial statements from the beneficiary concerned and its linked third parties. The coordinator must include them in the next periodic report after the suspension is lifted or — if suspension is not lifted before the end of the action — in the last periodic report.

The beneficiaries may suspend implementation of the action (see Article 49.1) or terminate the Agreement or the participation of the beneficiary concerned (see Article 50.1 and 50.2).

ARTICLE 49 — SUSPENSION OF THE ACTION IMPLEMENTATION

49.1 Suspension of the action implementation, by the beneficiaries

49.1.1 Conditions

The beneficiaries may suspend implementation of the action or any part of it, if exceptional circumstances — in particular *force majeure* (see Article 51) — make implementation impossible or excessively difficult.

49.1.2 Procedure

The coordinator must immediately formally notify to the Agency the suspension (see Article 52), stating:

- the reasons why and
- the expected date of resumption.

The suspension will **take effect** the day this notification is received by the Agency.

Once circumstances allow for implementation to resume, the coordinator must immediately formally notify the Agency and request an **amendment** of the Agreement to set the date on which the action will be resumed, extend the duration of the action and make other changes necessary to adapt the action to the new situation (see Article 55) — unless the Agreement or the participation of a beneficiary has been terminated (see Article 50).

The suspension will be **lifted** with effect from the resumption date set out in the amendment. This date may be before the date on which the amendment enters into force.

Costs incurred during suspension of the action implementation are not eligible (see Article 6).

49.2 Suspension of the action implementation, by the Agency

49.2.1 Conditions

The Agency may suspend implementation of the action or any part of it, if:

(a) a beneficiary (or a natural person who has the power to represent or take decisions on its behalf) has committed or is suspected of having committed:

(i) substantial errors, irregularities or fraud or

(ii) serious breach of obligations under the Agreement or during the award procedure (including improper implementation of the action, submission of false declaration, failure to provide required information, breach of ethical principles);

(b) a beneficiary (or a natural person who has the power to represent or take decisions on its behalf) has committed — in other EU or Euratom grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant (**extension of findings from other grants to this grant**; see Article 22.5.2), or

(c) the action is suspected of having lost its scientific or technological relevance.

49.2.2 Procedure

Before suspending implementation of the action, the Agency will formally notify the coordinator or beneficiary concerned:

- informing it of its intention to suspend the implementation and the reasons why and
- inviting it to submit observations within 30 days of receiving notification.

If the Agency does not receive observations or decides to pursue the procedure despite the observations it has received, it will formally notify **confirmation** of the suspension. Otherwise, it will formally notify that the procedure is not continued.

The suspension will **take effect** five days after confirmation notification is received (or on a later date specified in the notification).

It will be **lifted** if the conditions for resuming implementation of the action are met.

The coordinator or beneficiary concerned will be formally notified of the lifting and the Agreement will be **amended** to set the date on which the action will be resumed, extend the duration of the action and make other changes necessary to adapt the action to the new situation (see Article 55) — unless the Agreement has already been terminated (see Article 50).

The suspension will be lifted with effect from the resumption date set out in the amendment. This date may be before the date on which the amendment enters into force.

Costs incurred during suspension are not eligible (see Article 6).

The beneficiaries may not claim damages due to suspension by the Agency (see Article 46).

Suspension of the action implementation does not affect the Agency's right to terminate the Agreement or participation of a beneficiary (see Article 50), reduce the grant or recover amounts unduly paid (see Articles 43 and 44).

ARTICLE 50 — TERMINATION OF THE AGREEMENT OR OF THE PARTICIPATION OF ONE OR MORE BENEFICIARIES

50.1 Termination of the Agreement, by the beneficiaries

50.1.1 Conditions and procedure

The beneficiaries may terminate the Agreement.

The coordinator must formally notify termination to the Agency (see Article 52), stating:

- the reasons why and
- the date the termination will take effect. This date must be after the notification.

If no reasons are given or if the Agency considers the reasons do not justify termination, the Agreement will be considered to have been '**terminated improperly**'.

The termination will **take effect** on the day specified in the notification.

50.1.2 Effects

The coordinator must — within 60 days from when termination takes effect — submit:

(i) a periodic report (for the open reporting period until termination; see Article 20.3) and

(ii) the final report (see Article 20.4).

If the Agency does not receive the reports within the deadline (see above), only costs which are included in an approved periodic report will be taken into account.

The Agency will **calculate** the final grant amount (see Article 5.3) and the balance (see Article 21.4) on the basis of the reports submitted. Only costs incurred until termination are eligible (see Article 6). Costs relating to contracts due for execution only after termination are not eligible.

Improper termination may lead to a reduction of the grant (see Article 43).

After termination, the beneficiaries' obligations (in particular Articles 20, 22, 23, Section 3 of Chapter 4, 36, 37, 38, 40, 42, 43 and 44) continue to apply.

50.2 Termination of the participation of one or more beneficiaries, by the beneficiaries

50.2.1 Conditions and procedure

The participation of one or more beneficiaries may be terminated by the coordinator, on request of the beneficiary concerned or on behalf of the other beneficiaries.

The coordinator must formally notify termination to the Agency (see Article 52) and inform the beneficiary concerned.

If the coordinator's participation is terminated without its agreement, the formal notification must be done by another beneficiary (acting on behalf of the other beneficiaries).

The notification must include:

- the reasons why;

- the opinion of the beneficiary concerned (or proof that this opinion has been requested in writing);

- the date the termination takes effect. This date must be after the notification, and

- a request for amendment (see Article 55), with a proposal for reallocation of the tasks and the estimated budget of the beneficiary concerned (see Annexes 1 and 2) and, if necessary, the addition of one or more new beneficiaries (see Article 56). If termination takes effect after the period set out in Article 3, no request for amendment must be included unless the beneficiary concerned is the coordinator. In this case, the request for amendment must propose a new coordinator.

If this information is not given or if the Agency considers that the reasons do not justify termination, the participation will be considered to have been **terminated improperly**.

The termination will **take effect** on the day specified in the notification.

50.2.2 Effects

The coordinator must — within 30 days from when termination takes effect — submit:

(i) a report on the distribution of payments to the beneficiary concerned and

(ii) if termination takes effect during the period set out in Article 3, a '**termination report**' from the beneficiary concerned, for the open reporting period until termination, containing an overview of the progress of the work, an overview of the use of resources, the individual financial statement and, if applicable, the certificate on the financial statement (see Articles 20.3 and 20.4).

The information in the termination report must also be included in the periodic report for the next reporting period (see Article 20.3).

If the request for amendment is rejected by the Agency, (because it calls into question the decision awarding the grant or breaches the principle of equal treatment of applicants), the Agreement may be terminated according to Article 50.3.1(c).

If the request for amendment is accepted by the Agency, the Agreement is **amended** to introduce the necessary changes (see Article 55).

The Agency will calculate — on the basis of the periodic reports, the termination report and the report on the distribution of payments — **calculate** the amount which is due to the beneficiary and if the (pre-financing and interim) payments received by the beneficiary exceed this amount.

The **amount which is due** is calculated in the following steps:

Step 1 — Application of the reimbursement rate to the eligible costs

The grant amount for the beneficiary is calculated by applying the reimbursement rate(s) to the total eligible costs declared by the beneficiary and its linked third parties in the termination report and approved by the Agency.

Only costs incurred by the beneficiary concerned until termination takes effect are

eligible (see Article 6). Costs relating to contracts due for execution only after termination are not eligible.

Step 2 — Reduction due to substantial errors, irregularities or fraud or serious breach of obligations

In case of a reduction (see Article 43), the Agency will calculate the reduced grant amount for the beneficiary by deducting the amount of the reduction (calculated in proportion to the seriousness of the errors, irregularities or fraud or breach of obligations, in accordance with Article 43.2) from the grant amount for the beneficiary.

If the payments received **exceed the amounts due**:

- if termination takes effect during the period set out in Article 3 and the request for amendment is accepted, the beneficiary concerned must repay to the coordinator the amount unduly received. The Agency will formally notify the amount unduly received and request the beneficiary concerned to repay it to the coordinator within 30 days of receiving notification. If it does not repay the coordinator, the Agency will draw upon the Guarantee Fund to pay the coordinator and then notify a **debit note** on behalf of the Guarantee Fund to the beneficiary concerned (see Article 44);

- in all other cases, in particular if termination takes effect after the period set out in Article 3, the Agency will formally notify a **debit note** to the beneficiary concerned. If payment is not made by the date in the debit note, the Guarantee Fund will pay to the Agency the amount due and the Agency will notify a debit note on behalf of the Guarantee Fund to the beneficiary concerned (see Article 44);

- if the beneficiary concerned is the former coordinator, it must repay the new coordinator according to the procedure above, unless:

  - termination takes effect after an interim payment and

  - the former coordinator has not distributed amounts received as pre-financing or interim payments (see Article 21.7).

  In this case, the Agency will formally notify a **debit note** to the former coordinator. If payment is not made by the date in the debit note, the Guarantee Fund will pay to the Agency the amount due. The Agency will then pay the new coordinator and notify a debit note on behalf of the Guarantee Fund to the former coordinator (see Article 44).

If the payments received **do not exceed the amounts due**: amounts owed to the beneficiary concerned will be included in the next interim or final payment.

If the Agency does not receive the termination report within the deadline (see above), only costs included in an approved periodic report will be taken into account.

If the Agency does not receive the report on the distribution of payments within the deadline (see above), it will consider that:

- the coordinator did not distribute any payment to the beneficiary concerned and that

- the beneficiary concerned must not repay any amount to the coordinator.

Improper termination may lead to a reduction of the grant (see Article 43) or termination of the Agreement (see Article 50).

After termination, the concerned beneficiary's obligations (in particular Articles 20, 22, 23, Section 3 of Chapter 4, 36, 37, 38, 40, 42, 43 and 44) continue to apply.

50.3 Termination of the Agreement or the participation of one or more beneficiaries, by the Agency

50.3.1 Conditions

The Agency may terminate the Agreement or the participation of one or more beneficiaries, if:

(a) one or more beneficiaries do not accede to the Agreement (see Article 56);

(b) a change to their legal, financial, technical, organisational or ownership situation (or those of its linked third parties) is likely to substantially affect or delay the implementation of the action or calls into question the decision to award the grant;

(c) following termination of participation for one or more beneficiaries (see above), the necessary changes to the Agreement would call into question the decision awarding the grant or breach the principle of equal treatment of applicants (see Article 55);

(d) implementation of the action is prevented by force majeure (see Article 51) or suspended by the coordinator (see Article 49.1) and either:

(i) resumption is impossible, or

(ii) the necessary changes to the Agreement would call into question the decision awarding the grant or breach the principle of equal treatment of applicants;

(e) a beneficiary is declared bankrupt, being wound up, having its affairs administered by the courts, has entered into an arrangement with creditors, has suspended business activities, or is subject to any other similar proceedings or procedures under national law;

(f) a beneficiary (or a natural person who has the power to represent or take decisions on its behalf) has been found guilty of professional misconduct, proven by any means;

(g) a beneficiary does not comply with the applicable national law on taxes and social security;

(h) the action has lost scientific or technological relevance;

(i) not applicable;

(j) not applicable;

(k) a beneficiary (or a natural person who has the power to represent or take decisions on its behalf) has committed fraud, corruption, or is involved in a criminal organisation, money laundering or any other illegal activity;

(l) a beneficiary (or a natural person who has the power to represent or take decisions on its behalf) has committed:

(i) substantial errors, irregularities or fraud or

(ii) serious breach of obligations under the Agreement or during the award procedure (including improper implementation of the action, submission of false information, failure to provide required information, breach of ethical principles);

(m) a beneficiary (or a natural person who has the power to represent or take decisions on its behalf) has committed — in other EU or Euratom grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant (**extension of findings from other grants to this grant**; see Article 22.5.2).

(n) despite a specific request by the Agency, a beneficiary does not request — through the coordinator — an amendment to the Agreement to end the participation of one of its linked third parties that is in one of the situations under points (e), (f), (g), (k), (l) or (m) and to reallocate its tasks.

50.3.2 Procedure

Before terminating the Agreement or participation of one or more beneficiaries, the Agency will formally notify the coordinator or beneficiary concerned:

- informing it of its intention to terminate and the reasons why and
- inviting it, within 30 days of receiving notification, to submit observations and — in case of Point (l.ii) above — to inform the Agency of the measures to ensure compliance with the obligations under the Agreement.

If the Agency does not receive observations or decides to pursue the procedure despite the observations it has received, it will formally notify to the coordinator or beneficiary concerned **confirmation** of the termination and the date it will take effect. Otherwise, it will formally notify that the procedure is not continued.

The termination will **take effect**:

- for terminations under Points (b), (c), (e), (g), (h), (j), (l.ii) and (n) above: on the day specified in the notification of the confirmation (see above);
- for terminations under Points (a), (d), (f), (i), (k), (l.i) and (m) above: on the day after the notification of the confirmation is received.

50.3.3 Effects

(a) for **termination of the Agreement**:

The coordinator must — within 60 days from when termination takes effect — submit:

(i) a periodic report (for the last open reporting period until termination; see Article 20.3) and

(ii) a final report (see Article 20.4).

If the Agreement is terminated for breach of the obligation to submit reports (see Articles 20.8 and 50.3.1(l)), the coordinator may not submit any reports after termination.

If the Agency does not receive the reports within the deadline (see above), only costs which are included in an approved periodic report will be taken into account.

The Agency will **calculate** the final grant amount (see Article 5.3) and the balance (see Article 21.4) on the basis of the reports submitted. Only costs incurred until termination takes effect are eligible (see Article 6). Costs relating to contracts due for execution only after termination are not eligible.

This does not affect the Agency's right to reduce the grant (see Article 43) or to impose administrative sanctions (Article 45).

The beneficiaries may not claim damages due to termination by the Agency (see Article 46).

After termination, the beneficiaries' obligations (in particular Articles 20, 22, 23, Section 3 of Chapter 4, 36, 37, 38, 40, 42, 43 and 44) continue to apply.

(b) for **termination of the participation of one or more beneficiaries**:

The coordinator must — within 60 days from when termination takes effect — submit:

(i) a report on the distribution of payments to the beneficiary concerned;

(ii) a request for amendment (see Article 55), with a proposal for reallocation of the tasks and estimated budget of the beneficiary concerned (see Annexes 1 and 2) and, if necessary, the addition of one or more new beneficiaries (see Article 56). If termination is notified after the period set out in Article 3, no request for amendment must be submitted unless the beneficiary concerned is the coordinator. In this case the request for amendment must propose a new coordinator, and

(iii) if termination takes effect during the period set out in Article 3, a **termination report** from the beneficiary concerned, for the open reporting period until termination, containing an overview of the progress of the work, an overview of the use of resources, the individual financial statement and, if applicable, the certificate on the financial statement (see Article 20).

The information in the termination report must also be included in the periodic report for the next reporting period (see Article 20.3).

If the request for amendment is rejected by the Agency, (because it calls into question the decision awarding the grant or breaches the principle of equal treatment of applicants), the Agreement may be terminated according to Article 50.3.1(c).

If the request for amendment is accepted by the Agency, the Agreement is **amended** to introduce the necessary changes (see Article 55).

The Agency will calculate — on the basis of the periodic reports, the termination report and the

report on the distribution of payments — **calculate** the amount which is due to the beneficiary and if the (pre-financing and interim) payments received by the beneficiary exceed this amount.

The **amount which is due** is calculated in the following steps:

Step 1 — Application of the reimbursement rate to the eligible costs

The grant amount for the beneficiary is calculated by applying the reimbursement rate(s) to the total eligible costs declared by the beneficiary and its linked third parties in the termination report and approved by the Agency.

Only costs incurred by the beneficiary concerned until termination takes effect are eligible (see Article 6). Costs relating to contracts due for execution only after termination are not eligible.

Step 2 — Reduction due to substantial errors, irregularities or fraud or serious breach of obligations

In case of a reduction (see Article 43), the Agency will calculate the reduced grant amount for the beneficiary by deducting the amount of the reduction (calculated in proportion to the seriousness of the errors, irregularities or fraud or breach of obligations, in accordance with Article 43.2) from the grant amount for the beneficiary.

If the payments received **exceed the amounts due**:

- if termination takes effect during the period set out in Article 3 and the request for amendment is accepted, the beneficiary concerned must repay to the coordinator the amount unduly received. The Agency will formally notify the amount unduly received and request the beneficiary concerned to repay it to the coordinator within 30 days of receiving notification. If it does not repay the coordinator, the Agency will draw upon the Guarantee Fund to pay the coordinator and then notify a **debit note** on behalf of the Guarantee Fund to the beneficiary concerned (see Article 44);

- in all other cases, in particular if termination takes effect after the period set out in Article 3, the Agency will formally notify a **debit note** to the beneficiary concerned. If payment is not made by the date in the debit note, the Guarantee Fund will pay to the Agency the amount due and the Agency will notify a debit note on behalf of the Guarantee Fund to the beneficiary concerned (see Article 44);

- if the beneficiary concerned is the former coordinator, it must repay the new coordinator according to the procedure above, unless:

  - termination takes effect after an interim payment and

  - the former coordinator has not distributed amounts received as pre-financing or interim payments (see Article 21.7).

  In this case, the Agency will formally notify a **debit note** to the former coordinator. If payment is not made by the date in the debit note, the Guarantee Fund will pay to the

Agency the amount due. The Agency will then pay the new coordinator and notify a debit note on behalf of the Guarantee Fund to the former coordinator (see Article 44).

If the payments received **do not exceed the amounts due**: amounts owed to the beneficiary concerned will be included in the next interim or final payment.

If the Agency does not receive the termination report within the deadline (see above), only costs included in an approved periodic report will be taken into account.

If the Agency does not receive the report on the distribution of payments within the deadline (see above), it will consider that:

- the coordinator did not distribute any payment to the beneficiary concerned and that
- the beneficiary concerned must not repay any amount to the coordinator.

After termination, the concerned beneficiary's obligations (in particular Articles 20, 22, 23, Section 3 of Chapter 4, 36, 37, 38, 40, 42, 43 and 44) continue to apply.

SECTION 4 FORCE MAJEURE

ARTICLE 51 — FORCE MAJEURE

'Force majeure' means any situation or event that:

- prevents either party from fulfilling their obligations under the Agreement,
- was unforeseeable, exceptional situation and beyond the parties' control,
- was not due to error or negligence on their part (or on the part of third parties involved in the action), and
- proves to be inevitable in spite of exercising all due diligence.

The following cannot be invoked as force majeure:

- any default of a service, defect in equipment or material or delays in making them available, unless they stem directly from a relevant case of force majeure,
- labour disputes or strikes, or
- financial difficulties.

Any situation constituting force majeure must be formally notified to the other party without delay, stating the nature, likely duration and foreseeable effects.

The parties must immediately take all the necessary steps to limit any damage due to force majeure and do their best to resume implementation of the action as soon as possible.

The party prevented by force majeure from fulfilling its obligations under the Agreement cannot be considered in breach of them.

CHAPTER 7 FINAL PROVISIONS

ARTICLE 52 — COMMUNICATION BETWEEN THE PARTIES

52.1 Form and means of communication

Communication under the Agreement (information, requests, submissions, 'formal notifications', etc.) must:

- be made in writing and
- bear the number of the Agreement.

Until the payment of the balance: all communication must be made through the electronic exchange system and using the forms and templates provided there.

After the payment of the balance: formal notifications must be made by registered post with proof of delivery ('formal notification on paper').

Communications in the electronic exchange system must be made by persons authorised according to the Participant Portal Terms & Conditions. For naming the authorised persons, each beneficiary must have designated — before the signature of this Agreement — a 'legal entity appointed representative (LEAR)'. The role and tasks of the LEAR are stipulated in his/her appointment letter (see Participant Portal Terms & Conditions).

If the electronic exchange system is temporarily unavailable, instructions will be given on the Agency and Commission websites.

52.2 Date of communication

Communications are considered to have been made when they are sent by the sending party (i.e. on the date and time they are sent through the electronic exchange system).

Formal notifications through the **electronic** exchange system are considered to have been made when they are received by the receiving party (i.e. on the date and time of acceptance by the receiving party, as indicated by the time stamp). A formal notification that has not been accepted within 10 days after sending is considered to have been accepted.

Formal notifications **on paper** sent by **registered post** with proof of delivery (only after the payment of the balance) are considered to have been made on either:

- the delivery date registered by the postal service or
- the deadline for collection at the post office.

If the electronic exchange system is temporarily unavailable, the sending party cannot be considered in breach of its obligation to send a communication within a specified deadline.

52.3 Addresses for communication

The **electronic** exchange system must be accessed via the following URL:

https://ec.europa.eu/research/participants/portal/desktop/en/projects/

The Agency will formally notify the coordinator and beneficiaries in advance any changes to this URL.

Formal notifications on paper (only after the payment of the balance) addressed **to the Agency** must be sent to the following address:

Research Executive Agency
Inclusive, Innovative and Reflective Societies
COV2 16/007
B-1049 Brussels Belgium

Formal notifications on paper (only after the payment of the balance) addressed **to the beneficiaries** must be sent to their legal address as specified in the Participant Portal Beneficiary Register.

ARTICLE 53 — INTERPRETATION OF THE AGREEMENT

53.1 Precedence of the Terms and Conditions over the Annexes

The provisions in the Terms and Conditions of the Agreement take precedence over its Annexes.

Annex 2 takes precedence over Annex 1.

53.2 Privileges and immunities

Not applicable

ARTICLE 54 — CALCULATION OF PERIODS, DATES AND DEADLINES

In accordance with Regulation No 1182/71[28], periods expressed in days, months or years are calculated from the moment the triggering event occurs.

The day during which that event occurs is not considered as falling within the period.

ARTICLE 55 — AMENDMENTS TO THE AGREEMENT

55.1 Conditions

The Agreement may be amended, unless the amendment entails changes to the Agreement which would call into question the decision awarding the grant or breach the principle of equal treatment of applicants.

Amendments may be requested by any of the parties.

55.2 Procedure

The party requesting an amendment must submit a request for amendment signed in the electronic exchange system (see Article 52).

[28] Regulation (EEC, Euratom) No 1182/71 of the Council of 3 June 1971 determining the rules applicable to periods, dates and time-limits (OJ L 124, 8.6.1971, p. 1).

The coordinator submits and receives requests for amendment on behalf of the beneficiaries (see Annex 3).

If a change of coordinator is requested without its agreement, the submission must be done by another beneficiary (acting on behalf of the other beneficiaries).

The request for amendment must include:

- the reasons why;
- the appropriate supporting documents;
- for a change of coordinator without its agreement: the opinion of the coordinator (or proof that this opinion has been requested in writing).

The Agency may request additional information.

If the party receiving the request agrees, it must sign the amendment in the electronic exchange system within 45 days of receiving notification (or any additional information the Agency has requested). If it does not agree, it must formally notify its disagreement within the same deadline. The deadline may be extended, if necessary for the assessment of the request. If no notification is received within the deadline, the request is considered to have been rejected

An amendment **enters into force** on the day of the signature of the receiving party.

An amendment **takes effect** on the date agreed by the parties or, in the absence of such an agreement, on the date on which the amendment enters into force.

ARTICLE 56 — ACCESSION TO THE AGREEMENT

56.1 Accession of the beneficiaries mentioned in the Preamble

The other beneficiaries must accede to the Agreement by signing the Accession Form (see Annex 3) in the electronic exchange system (see Article 52) within 30 days after its entry into force (see Article 58).

They will assume the rights and obligations under the Agreement with effect from the date of its entry into force (see Article 58).

If a beneficiary does not accede to the Agreement within the above deadline, the coordinator must — within 30 days — request an amendment to make any changes necessary to ensure proper implementation of the action. This does not affect the Agency's right to terminate the Agreement (see Article 50).

56.2 Addition of new beneficiaries

In justified cases, the beneficiaries may request the addition of a new beneficiary.

For this purpose, the coordinator must submit a request for amendment in accordance with Article 55. It must include an Accession Form (see Annex 3) signed by the new beneficiary in the electronic exchange system (see Article 52).

New beneficiaries must assume the rights and obligations under the Agreement with effect from the date of their accession specified in the Accession Form (see Annex 3).

ARTICLE 57 — APPLICABLE LAW AND SETTLEMENT OF DISPUTES

57.1 Applicable law

The Agreement is governed by the applicable EU law, supplemented if necessary by the law of Belgium.

57.2 Dispute settlement

If a dispute concerning the interpretation, application or validity of the Agreement cannot be settled amicably, the General Court — or, on appeal, the Court of Justice of the European Union — has sole jurisdiction. Such actions must be brought under Article 272 of the Treaty on the Functioning of the EU (TFEU).

If a dispute concerns administrative sanctions, offsetting or an enforceable decision under Article 299 TFEU (see Articles 44, 45 and 46), the beneficiaries must bring action before the General Court — or, on appeal, the Court of Justice of the European Union — under Article 263 TFEU. Actions against enforceable decisions must be brought against the Commission (not against the Agency).

ARTICLE 58 — ENTRY INTO FORCE OF THE AGREEMENT

The Agreement will enter into force on the day of signature by the Agency or the coordinator, depending on which is later.

SIGNATURES

For the coordinator

For the Agency

EUROPEAN COMMISSION
Research Executive Agency
Inclusive, Innovative and Reflective Societies

ANNEX 1 (part A)

Research and Innovation action

NUMBER — 769608 — PoliVisu

Table of Contents

1.1. The project summary

Project Number [1]	769608	Project Acronym [2]	PoliVisu

One form per project

General information

Project title [3]	Policy Development based on Advanced Geospatial Data Analytics and Visualisation
Starting date [4]	01/11/2017
Duration in months [5]	36
Call (part) identifier [6]	H2020-SC6-CO-CREATION-2017
Topic	CO-CREATION-06-2017 Policy-development in the age of big data: data-driven policy-making, policy-modelling and policy-implementation
Fixed EC Keywords	Data reuse, Linked open data, Public administration innovation, Public sector innovation
Free keywords	Big data, geospatial data, analytics, visualisation, policy development, sensors, real-time data, linked open data, heatmaps, GIS, transport, traffic.

Abstract [7]

PoliVisu is a Research and Innovation project designed to evolve the traditional public policy making cycle using big data. The aim is to enhance an open set of digital tools to leverage data to help public sector decision-making become more democratic by (a) experimenting with different policy options through impact visualisation and (b) using the resulting visualisations to engage and harness the collective intelligence of policy stakeholders for collaborative solution development.
Working with three cities to address societal problems linked to smart mobility and urban planning, the intention is to enable public administrations to respond to urban challenges by enriching the policy making process with opportunities for policy experimentation at three different steps of the policy cycle (policy design, policy implementation, and policy evaluation). Experimentation of policy options will enable the cities to tackle complex, systemic policy problems that require innovative thinking to develop transformative solutions.

1.2. List of Beneficiaries

Project Number [1]	769608	Project Acronym [2]	PoliVisu

List of Beneficiaries

No	Name	Short name	Country	Project entry month[8]	Project exit month
1	VLAAMS GEWEST	AIV	Belgium	1	36
2	IS-practice	ISP	Belgium	1	36
3	EDIP SRO	EDIP	Czech Republic	1	36
4	SOCIETE D'ECONOMIE MIXTE ISSY - MEDIA (SEM ISSY MEDIA)	ISSY	France	1	36
5	HELP SERVICE REMOTE SENSING SRO	HSRS	Czech Republic	1	36
6	GEOSPARC NV	GEOS	Belgium	1	36
7	INNOCONNECT SRO	INCO	Czech Republic	1	36
8	CITY ZEN DATA	CZD	France	1	36
9	21C CONSULTANCY LIMITED	21C	United Kingdom	1	36
10	ATHENS TECHNOLOGY CENTER SA	ATC	Greece	1	36
11	SPRAVA INFORMACNICH TECHNOLOGII MESTA PLZNE, PRISPEVKOVA ORGANIZACE	SITMP	Czech Republic	1	36
12	MACQ SA	MACQ	Belgium	1	36
13	PLAN4ALL ZS	P4A	Czech Republic	1	36
14	POLITECNICO DI MILANO	POLIMI	Italy	1	36
15	STAD GENT	GENT	Belgium	1	36

1.3. Workplan Tables - Detailed Implementation

1.3.1. WT1 List of work packages

WP Number[9]	WP Title	Lead beneficiary[10]	Person-months[11]	Start month[12]	End month[13]
WP1	Ethics requirements	1 - AIV	N/A	1	36
WP2	Project and Quality Management	1 - AIV	55.50	1	36
WP3	Policy making and experiment cycle	14 - POLIMI	57.40	1	30
WP4	Technical components for Big Data Analysis and Advanced Visualisation	6 - GEOS	104.00	5	30
WP5	Components Integration	10 - ATC	46.00	6	33
WP6	Pilot Scenarios and Deployment	15 - GENT	106.00	1	36
WP7	Policy Impact and Evaluation	4 - ISSY	45.00	1	36
WP8	Dissemination, Exploitation and Standardisation	9 - 21C	63.50	1	36
		Total	477.40		

1.3.2. WT2 list of deliverables

Deliverable Number[14]	Deliverable Title	WP number[9]	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D1.1	POPD - Requirement No. 4	WP1	1 - AIV	Ethics	Confidential, only for members of the consortium (including the Commission Services)	6
D1.2	POPD - Requirement No. 6	WP1	1 - AIV	Ethics	Confidential, only for members of the consortium (including the Commission Services)	3
D1.3	H - Requirement No. 3	WP1	1 - AIV	Ethics	Confidential, only for members of the consortium (including the Commission Services)	1
D2.1	Project Vision	WP2	1 - AIV	Report	Public	1
D2.2	Project Management Plan	WP2	2 - ISP	Report	Confidential, only for members of the consortium (including the Commission Services)	2
D2.3	Quality & Risk Plan	WP2	2 - ISP	Report	Confidential, only for members of the consortium (including the Commission Services)	2
D2.4	Project Vision Update 1	WP2	1 - AIV	Report	Public	12
D2.5	Quality & Risk Report 1	WP2	1 - AIV	Report	Confidential, only for members of the consortium (including the Commission Services)	12
D2.6	Intermediate Status Report	WP2	1 - AIV	Report	Confidential, only for members of the consortium (including the Commission Services)	18
D2.7	Project Vision Update 2	WP2	1 - AIV	Report	Public	24
D2.8	Quality & Risk Report 2	WP2	1 - AIV	Report	Confidential, only for members	24

Deliverable Number[14]	Deliverable Title	WP number[9]	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
					of the consortium (including the Commission Services)	
D2.9	Quality & Risk Report 3	WP2	1 - AIV	Report	Confidential, only for members of the consortium (including the Commission Services)	36
D2.10	Data Management Plan (Iter. 1)	WP2	14 - POLIMI	ORDP: Open Research Data Pilot	Public	6
D2.11	Data Management Plan (Iter. 2)	WP2	14 - POLIMI	ORDP: Open Research Data Pilot	Public	12
D2.12	Data Management Plan (Iter. 3)	WP2	14 - POLIMI	ORDP: Open Research Data Pilot	Public	24
D2.13	Data Management Plan (final)	WP2	14 - POLIMI	ORDP: Open Research Data Pilot	Public	36
D3.1	Experimental dimension of policy making	WP3	14 - POLIMI	Report	Public	2
D3.2	The PoliVisu policy making model (DRAFT)	WP3	14 - POLIMI	Report	Public	3
D3.3	Data Literacy Survey Report	WP3	14 - POLIMI	Report	Public	6
D3.4	Policy experimentation and functional design 1	WP3	1 - AIV	Report	Public	6
D3.5	The PoliVisu policy making model (FINAL)	WP3	14 - POLIMI	Report	Public	12
D3.6	Policy experimentation and functional design 2	WP3	1 - AIV	Report	Public	12
D3.7	Policy experimentation and functional design 3	WP3	1 - AIV	Report	Public	21
D3.8	Experiment driven policy making: pitfalls and suggestions for Public Administrations	WP3	15 - GENT	Report	Public	24

Deliverable Number[14]	Deliverable Title	WP number[9]	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D3.9	Policy Network Canvas Report	WP3	15 - GENT	Report	Public	24
D3.10	Policy experimentation and functional design 4	WP3	1 - AIV	Report	Public	29
D4.1	Technical Specifications	WP4	6 - GEOS	Report	Public	9
D4.2	Metadata Specifications	WP4	5 - HSRS	Report	Public	10
D4.3	Software release for different technical components (1)	WP4	6 - GEOS	Demonstrator	Public	14
D4.4	Software release for different technical components (2)	WP4	6 - GEOS	Demonstrator	Public	22
D4.5	Privacy rules and data anonymization (White Paper DRAFT)	WP4	1 - AIV	Report	Public	24
D4.6	Software release for different technical components (3)	WP4	6 - GEOS	Demonstrator	Public	30
D4.7	Privacy rules and data anonymization (White Paper FINAL)	WP4	1 - AIV	Report	Public	30
D5.1	Technical Integration Plan	WP5	6 - GEOS	Report	Public	8
D5.2	Fully Functional Platform	WP5	10 - ATC	Demonstrator	Public	14
D5.3	Technical Testing Report 1	WP5	10 - ATC	Report	Public	14
D5.4	Technical Testing Report 2	WP5	10 - ATC	Report	Public	22
D5.5	Technical Testing Report 3	WP5	10 - ATC	Report	Public	30
D6.1	Pilot Scenarios	WP6	15 - GENT	Report	Public	3
D6.2	Baseline Analyses	WP6	15 - GENT	Report	Public	7
D6.3	Policy implementation and compliance report	WP6	15 - GENT	Report	Public	35
D6.4	Final Report	WP6	15 - GENT	Report	Public	36
D7.1	Evaluation Plan	WP7	4 - ISSY	Report	Public	6
D7.2	Recommendation for future deployments (It. 1)	WP7	4 - ISSY	Report	Public	12

Deliverable Number[14]	Deliverable Title	WP number[9]	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D7.3	Recommendation for future deployments (It. 2)	WP7	4 - ISSY	Report	Public	21
D7.4	Big & Open Data Use in Policy Making Manual (DRAFT)	WP7	4 - ISSY	Report	Public	24
D7.5	Recommendation for future deployments (It. 3)	WP7	4 - ISSY	Report	Public	29
D7.6	Big & Open Data Use in Policy Making Manual (Final)	WP7	4 - ISSY	Report	Public	32
D7.7	Final Evaluation Report	WP7	4 - ISSY	Report	Public	36
D8.1	Impact Enhancement Roadmap	WP8	9 - 21C	Report	Public	2
D8.2	Standards White Paper Ed. 1	WP8	1 - AIV	Report	Public	12
D8.3	Business and Exploitation Plan 1	WP8	9 - 21C	Report	Public	12
D8.4	PoliVisu Playbox 1	WP8	9 - 21C	Report	Public	14
D8.5	Standards White Paper Ed. 2	WP8	1 - AIV	Report	Public	24
D8.6	Updated Business and Exploitation Plan 2	WP8	9 - 21C	Report	Public	24
D8.7	PoliVisu Playbox 2	WP8	9 - 21C	Report	Public	26
D8.8	PoliVisu Training Module	WP8	9 - 21C	Report	Public	28
D8.9	Standards White Paper Ed. 3	WP8	1 - AIV	Report	Public	34
D8.10	Updated Business and Exploitation Plan 3	WP8	9 - 21C	Report	Public	34
D8.11	PoliVisu Playbox 3	WP8	9 - 21C	Report	Public	36

1.3.3. WT3 Work package descriptions

Work package number [9]	WP1	**Lead beneficiary** [10]	1 - AIV
Work package title	Ethics requirements		
Start month	1	**End month**	36

Objectives

The objective is to ensure compliance with the 'ethics requirements' set out in this work package.

Description of work and role of partners

WP1 - Ethics requirements [Months: 1-36]
AIV
This work package sets out the 'ethics requirements' that the project must comply with.

List of deliverables

Deliverable Number[14]	Deliverable Title	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D1.1	POPD - Requirement No. 4	1 - AIV	Ethics	Confidential, only for members of the consortium (including the Commission Services)	6
D1.2	POPD - Requirement No. 6	1 - AIV	Ethics	Confidential, only for members of the consortium (including the Commission Services)	3
D1.3	H - Requirement No. 3	1 - AIV	Ethics	Confidential, only for members of the consortium (including the Commission Services)	1

Description of deliverables

The 'ethics requirements' that the project must comply with are included as deliverables in this work package.

D1.1 : POPD - Requirement No. 4 [6]

Copies of opinion or confirmation by the competent Institutional Data Protection Officer and/or authorization or notification by the National Data Protection Authority must be obtained and submitted upon request (which ever applies according to the Data Protection Directive (EC Directive 95/46, currently under revision, and the national law).

D1.2 : POPD - Requirement No. 6 [3]

Before the beginning of an activity raising an ethical issue, the applicant must confirm that any ethics committee opinion required under national law has been obtained, and is kept on file.

D1.3 : H - Requirement No. 3 [1]

Templates of the informed consent forms and information sheet must be submitted.

Schedule of relevant Milestones

Milestone number[18]	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification

Work package number [9]	WP2	Lead beneficiary [10]	1 - AIV
Work package title	Project and Quality Management		
Start month	1	End month	36

Objectives

WP2 will be under the responsibility of the coordinator – AIV – supported by an experienced project office – ISP – and will last throughout the entire lifecycle of the project. The objective of the work package is to implement and coordinate the use of a trusted project management methodology to: maintain and work towards the vision of the project, monitor the overall performance of the project, ensure all outputs are delivered to time and to budget, ensure the quality criteria for all outputs are met, keep the project on track and manage all risks and issues, administer project resources and monitor project expenses, ensure configuration of all project documentation, promote project visibility, guarantee that all ethical issues related to the project are properly considered and respond to and support all PoliVisu Partners.

Description of work and role of partners

WP2 - Project and Quality Management [Months: 1-36]
AIV, ISP, EDIP, ISSY, HSRS, GEOS, INCO, CZD, 21C, ATC, SITMP, MACQ , P4A, POLIMI, GENT
Task 2.1 Project Visioning (AIV (1), EDIP (0.1), ISP (1), ISSY (0.2), HSRS (0.1), GEOS (0.1), INCO (0.1), CZD (0.1), 21C (0.5), ATC (0.1), SITMP (0.2), MACQ (0.1), P4A (0.1), POLIMI (0.1), GENT (0.2), M01 - M24):
This task will focus on the coordination of the consortium effort towards the vision of the project so that the partners have a clear view of the future scenario to work towards. It involves the organisation of an interactive session during the project kick off meeting engaging all project stakeholders. This session will draw out the expectations of the partners and help the diverse participating groups to make the initial steps towards a common understanding. The vision will be further detailed in the user requirements task of WP2 and in the pilot scenarios definition of WP5. The project vision will be re-discussed annually (M12, M24) so that it remains up-to-date, corresponds to the business reality and addresses any future challenges that arise during the project.

Task 2.2 Project Management and Administration (ISP (18), AIV (6), EDIP (1), ISSY (2), HSRS (1), GEOS (2), INCO (1), CZD (1), 21C (2), ATC (2), SITMP (1), MACQ (1), P4A (1), POLIMI (2), GENT (2), M01 - M36):
The Work Package will be controlled by the AIV Project Director through the ISP Project Manager and will consist of a series of tasks including: managing project meetings, controlling deadlines and delivery dates, producing management documentation, performing quality control and risk management, resolving issues and conflicts, collecting cost statements and any other financial reports, acting as the liaison point of contact with EU, managing partner and stakeholder enquiries.

The workflows of the different WP's and their interdependencies will be designed the first 2 months of the project. ISP will set up a communication platform and online workspace to manage the project. Participating Partners: ISP will coordinate the project management activities. All partners will be involved in peer-reviewing deliverables as instructed by the project manager. AIV will have the final sign-off of all deliverables before submission to the Commission.

Task 2.3 Quality Management and Performance Monitoring (ISP (4), AIV (2), ISSY (0.5), 21C (0.5), ATC (0.5), POLIMI (0.5), GENT (0.5), M01 - M36):
Performance monitoring goes beyond controlling performance in the fundamental areas of budget and schedule. It also addresses the monitoring, measurement and management of the project's scope, quality, partner satisfaction, user satisfaction and the interdependent team relationships. To fulfil regular project and performance monitoring requirements the Project Manager will coordinate regular feedback from all the partners on activities completed, time spent, issues faced, deliverables achieved in the form of interim reports. These interim reports will be shared with the Commission.

A risk assessment will be performed the first months of the project and re-assessed regularly. Participating Partners: ISP will be responsible for collating the interim reports. Each WP-leader will be responsible for reporting progress to the project manager. Once a year a consortium meeting with all partners will be organized. Intermediate project meetings will be held in each of the tree pilot sites (Gent, Plzen and Issy-les-Moulineaux) approximately every 4 month; the Project Manager will attend these meetings. Ad-hoc conference calls will be organized around 'thematic' issues, only partners involved in these issues will be obliged to participate in this conference, however all partners will be welcome to join.

Participation per Partner

Partner number and short name	WP2 effort
1 - AIV	9.00
2 - ISP	23.00
3 - EDIP	1.10
4 - ISSY	2.70
5 - HSRS	1.10
6 - GEOS	2.10
7 - INCO	1.10
8 - CZD	1.10
9 - 21C	3.00
10 - ATC	2.60
11 - SITMP	1.20
12 - MACQ	1.10
13 - P4A	1.10
14 - POLIMI	2.60
15 - GENT	2.70
Total	55.50

List of deliverables

Deliverable Number[14]	Deliverable Title	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D2.1	Project Vision	1 - AIV	Report	Public	1
D2.2	Project Management Plan	2 - ISP	Report	Confidential, only for members of the consortium (including the Commission Services)	2
D2.3	Quality & Risk Plan	2 - ISP	Report	Confidential, only for members of the consortium (including the Commission Services)	2
D2.4	Project Vision Update 1	1 - AIV	Report	Public	12
D2.5	Quality & Risk Report 1	1 - AIV	Report	Confidential, only for members of the consortium (including the Commission Services)	12
D2.6	Intermediate Status Report	1 - AIV	Report	Confidential, only for members of the	18

List of deliverables

Deliverable Number[14]	Deliverable Title	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
				consortium (including the Commission Services)	
D2.7	Project Vision Update 2	1 - AIV	Report	Public	24
D2.8	Quality & Risk Report 2	1 - AIV	Report	Confidential, only for members of the consortium (including the Commission Services)	24
D2.9	Quality & Risk Report 3	1 - AIV	Report	Confidential, only for members of the consortium (including the Commission Services)	36
D2.10	Data Management Plan (Iter. 1)	14 - POLIMI	ORDP: Open Research Data Pilot	Public	6
D2.11	Data Management Plan (Iter. 2)	14 - POLIMI	ORDP: Open Research Data Pilot	Public	12
D2.12	Data Management Plan (Iter. 3)	14 - POLIMI	ORDP: Open Research Data Pilot	Public	24
D2.13	Data Management Plan (final)	14 - POLIMI	ORDP: Open Research Data Pilot	Public	36

Description of deliverables

D2.1 : Project Vision [1]
One page deliverable summarising the results of the project visioning process.

D2.2 : Project Management Plan [2]
Report outlining all activities and responsibilities for delivering the project

D2.3 : Quality & Risk Plan [2]
Management tool detailing all KPIs and a detailed risk log and contingency plan

D2.4 : Project Vision Update 1 [12]
Updated vision

D2.5 : Quality & Risk Report 1 [12]
Updated Quality and Risk logs

D2.6 : Intermediate Status Report [18]
-

D2.7 : Project Vision Update 2 [24]
Updated vision

D2.8 : Quality & Risk Report 2 [24]

Updated Quality and Risk logs

D2.9 : Quality & Risk Report 3 [36]

Updated Quality and Risk logs

D2.10 : Data Management Plan (Iter. 1) [6]

DMP describes the data management life cycle for all data sets that will be collected, processed or generated by the research project. It is a document outlining how research data will be handled during a research project, and even after the project is completed, describing what data will be collected, processed or generated and following what methodology and standards, whether and how this data will be shared and/or made open, and how it will be curated and preserved. The DPM will be defined at very early stage of the project and will be updated continuously with new submissions at M12, M24 and M36.

D2.11 : Data Management Plan (Iter. 2) [12]

the DMP update

D2.12 : Data Management Plan (Iter. 3) [24]

the DPM update

D2.13 : Data Management Plan (final) [36]

updated DPM - final version

Schedule of relevant Milestones

Milestone number[18]	**Milestone title**	**Lead beneficiary**	**Due Date (in months)**	**Means of verification**
MS1	MS1	1 - AIV	6	Pilot plan and evaluation methodology created. Policy experimentation requirements, functional design and technical specifications completed. Communications plan delivered.
MS5	MS5	1 - AIV	36	Manual on big data use in policy making published, pilot final cycle evaluated, exploitation strategy defined, final version of PlayBox released, final results disseminated.

Work package number [9]	WP3	Lead beneficiary [10]	14 - POLIMI
Work package title	Policy making and experiment cycle		
Start month	1	End month	30

Objectives

This WP has two main goals:

- exploring the experimental dimensions of policy making;

- finalizing the policy making model based on the sequence of policy experiment cycles.

These two goals will guide the WP3 work along the PoliVisu project to guarantee the effective exploitation of the availability of Big Data in policy making for sustainable and efficient mobility. Operational objectives of this WP are: (1) identifying the need for policy experimentation in Europe especially in the domain of urban and regional mobility, (2) developing a policy making model made up of policy experimentation cycles and oriented to achieve more adaptive and situation based policies in a more intense iterative approach, (3) creating operational guidelines for effectively exploit the experimentational dimension of mobility policies and (4) supporting PoliVisu pilots along the project development. Although in practice the need for policy experimentation is a clear goal in e policy making and analysis literature, this need has never really gained the opportunity to become operational as it can be today with the availability of open data. This WP will guide the experimentation approach to policy making conceptualized by PoliVisu. The 3 pilot cities will be in the "driver" seat of this process closely guided by the WP-leader and the Expert-group.

Description of work and role of partners

WP3 - Policy making and experiment cycle [Months: 1-30]
POLIMI, AIV, EDIP, ISSY, HSRS, GEOS, INCO, CZD, 21C, ATC, SITMP, MACQ , P4A, GENT
Task 3.1 Experimental dimension of policies, literature review (POLIMI (1), AIV (0.5), 21C (2.5), GENT (0.5), M01 - M02):
This task will undertake a research state-of- the-art literature on the relevance in policy making to create conditions for experiments. This task will obviously consider the rich and productive perspective offered by the availability of open data to finally operationalize the concept and to fasten the three main activities policy design, policy implementation and assessment.

Task 3.2 Data Literacy Survey (POLIMI (2), AIV (0.1), CZD (2), 21C (2), GENT (0.5), M01 - M06):
Data Literacy Survey will provide a comparative assessment of the extent of big data usage and literacy among public sector actors in Europe. By taking stock of current practices, devoted resources, data related skills and tools, as well as governance mechanisms, it will allow PoliVisu pilots to situate themselves within a pool of actors that use big data to improve internal efficiency and/or service delivery to citizens. Furthermore, survey results will lay the groundwork for future co-creation and experimentation activities in the three pilot cities.

Task 3.3 The PoliVisu Policy making model (POLIMI (3), AIV (0.5), ISSY (0.5), GEOS (0.5), 21C (2), ATC (0.1), SITMP (0.1), P4A (0.1), GENT (1), M01 - M12):
This task is aimed at framing, reviewing and finalize the PoliVisu policy making model. It will first produce the preliminari PoliVisu model and feeding the pilot planning and management. It will use the evaluation work carried out at the pilots' scale to finalize the model and complete it with relevant insights on the use of big data along the model steps and activities. Special attention will be given to: 1) policy devices, 2) policy actors, and 3) Policy experimental targets.

Task 3.4 Experiment based City Policy making (GENT (3), AIV (0.5), ISSY (1), 21C (2), SITMP (0.5), POLIMI (4), M03 - M24):
Based on the model provided in T3.3 and the baseline analysis that has been conducted in each of the pilots, a local policy will be developed in each of the cities. This task wants to make the PoliVisu outputs valuable and portable for Public Administration. It is aimed at developing a roadmap for Public Administration to adopt a experiment driven policy making approach so to maximize the adaptivity and situational approach made available by the existence, access and Visualisation of bigdata making the policy making process faster as capable of learning from impacts. This task will make also valuable considerations on Public Administration proneness to adopt an experimental approach to Policy making so to transform it into a continuous learning process.

Task 3.5 Policy Network Canvas (GENT (3), AIV (0.5), ISSY (1), 21C (2), SITMP (0.5), POLIMI (4), M03 - M24):

Using different research techniques (e.g. desk, interviews, focus groups), project partners will “paint” a Policy Network Canvas for each pilot city, showing on it the most influential actors, both in public and private sectors, affecting big data policymaking, relationships between these actors and points where bottlenecks impeding policy reforms tend to occur most frequently.

Task 3.6 Policy experimentation requirements & Functional Design (AIV (0.5), EDIP (0.5), ISSY (1), HSRS (0.5), GEOS (1), INCO (0.5), CZD (0.5), 21C (2), ATC (1), SITMP (0.5), MACQ (0.5), P4A (1), POLIMI (4), GENT (3), M03 - M30):
The Policy making and experimentation requirements starts with gathering the needs of the key actors in policy making and experimentations so to feed the PoliVisu IT solution. This analysis will be accomplished working in the interface of the different components of the PoliVisu ICT solutions and the different actors of the policy making and experimentation process. This task will also be carried out considering the several policy devices that the policy making actors are working on while making their decision so identifying and specific requirements towards the specific component of the ICT solution, not only referring to different actor’s role but also to the different devices possibly composing the policy. The functional design will be an iterative process to make the whole process agile. This is necessary because a change of policy will influence the need of data and the kind of visualisations. The technical partners and the pilots, together with the key stakeholders will be involved in the functional design process.

Participation per Partner

Partner number and short name	WP3 effort
1 - AIV	2.60
3 - EDIP	0.50
4 - ISSY	3.50
5 - HSRS	0.50
6 - GEOS	1.50
7 - INCO	0.50
8 - CZD	2.50
9 - 21C	12.50
10 - ATC	1.10
11 - SITMP	1.60
12 - MACQ	0.50
13 - P4A	1.10
14 - POLIMI	18.00
15 - GENT	11.00
Total	57.40

List of deliverables

Deliverable Number[14]	Deliverable Title	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D3.1	Experimental dimension of policy making	14 - POLIMI	Report	Public	2
D3.2	The PoliVisu policy making model (DRAFT)	14 - POLIMI	Report	Public	3

List of deliverables

Deliverable Number[14]	Deliverable Title	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D3.3	Data Literacy Survey Report	14 - POLIMI	Report	Public	6
D3.4	Policy experimentation and functional design 1	1 - AIV	Report	Public	6
D3.5	The PoliVisu policy making model (FINAL)	14 - POLIMI	Report	Public	12
D3.6	Policy experimentation and functional design 2	1 - AIV	Report	Public	12
D3.7	Policy experimentation and functional design 3	1 - AIV	Report	Public	21
D3.8	Experiment driven policy making: pitfalls and suggestions for Public Administrations	15 - GENT	Report	Public	24
D3.9	Policy Network Canvas Report	15 - GENT	Report	Public	24
D3.10	Policy experimentation and functional design 4	1 - AIV	Report	Public	29

Description of deliverables

D3.1 : Experimental dimension of policy making [2]

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D3.2 : The PoliVisu policy making model (DRAFT) [3]

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D3.3 : Data Literacy Survey Report [6]

-

D3.4 : Policy experimentation and functional design 1 [6]

This will be a requirement document that translate the local policy decision needs into functional design to hand over to WP4.

D3.5 : The PoliVisu policy making model (FINAL) [12]

-

D3.6 : Policy experimentation and functional design 2 [12]

-

D3.7 : Policy experimentation and functional design 3 [21]

-

D3.8 : Experiment driven policy making: pitfalls and suggestions for Public Administrations [24]

-

D3.9 : Policy Network Canvas Report [24]

-

D3.10 : Policy experimentation and functional design 4 [29]

-

Schedule of relevant Milestones

Milestone number[18]	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS1	MS1	1 - AIV	6	Pilot plan and evaluation methodology created. Policy experimentation requirements, functional design and technical specifications completed. Communications plan delivered.
MS2	MS2	1 - AIV	12	First versions of technical tools tested in pilots and evaluated (cycle 1). Refinement recommendations for the next cycle consolidated. First draft of Exploitation plan delivered.
MS3	MS3	1 - AIV	21	Refined technical components integrated into functional platform, tested in pilots (cycle 2) and evaluated. Refinement recommendations for the next cycle consolidated. 1st version of PoliVisu Playbox delivered.
MS4	MS4	1 - AIV	29	Third release of technical components integrated, tested in pilots and evaluated. Refinement recommendations for the final cycle consolidated

Work package number [9]	WP4	Lead beneficiary [10]	6 - GEOS
Work package title	Technical components for Big Data Analysis and Advanced Visualisation		
Start month	5	End month	30

Objectives

The aim of this WP is to deliver functional data-driven and crowd sourcing tools to help policy-making, -modelling and -implementation.

· Research state-of- the-art methods and techniques for Big Data Discovery, Access, Data Analysis and Advanced Visualisation

· Extend, enhance or adapt technical components to meet the policy making requirements

· Design and develop the necessary interfaces (services, API's) and standards to make the technical components open, reusable and interoperable

Description of work and role of partners

WP4 - Technical components for Big Data Analysis and Advanced Visualisation [Months: 5-30]
GEOS, AIV, EDIP, HSRS, INCO, CZD, ATC, MACQ , P4A
Task 4.1 Technical Specifications, Architecture & Interfaces (GEOS (4), AIV (1), EDIP (2), HSRS (2), INCO (2), CZD (2), ATC (3), MACQ (2), P4A (2), M05 - M09):
In this task the overall architecture and relation between the different components will be described. The high level technical specifications and responsibilities of the different components will be clarified and determined. Relevant standards will be studied and selected and the necessary services and API's to ensure easy integration of these components will be defined.
Major focus in this task is on how the different components/modules will interact with each other as well as with commonly used policy making support tools and platforms (e.g. existing citizen participation solution). For this, we will compare different standards coming from different communities (GEOSS, INSPIRE, IoT, Future Internet, OGC) and we will select best combination. In parallel we will define the necessary light interfaces, services and API's to ensure easy integration of these components.

Task 4.2 Big Data & Sensor Data Management (CZD (12), GEOS (1), MACQ (6), M07 - M30):
A smart data infrastructure for cities based on the Warp 10 big data architecture will be set up. Various data processing steps will be established. Analytics functions and algorithms to support policy making processes will be implemented.
In the legal and privacy context, different techniques and practices for anonymizing the data are investigated to identify which levels of anonymization can still be effectively used for various use cases in policy making processes. The appropriate anonymization techniques will be applied.
The processed and analysed big datasets will be published as (map) services. For integration in GIS applications we will use free and open source geospatial tools and services to generate OGC standards (WMS-T, WFS), TMS and vector tile based open formats.

Task 4.3 Big Data Visualisation (INCO (10), GEOS (3), MACQ (2), M07 - M30):
Open source software (WebGLayer, other geospatial software) will be used to realise the big data visualisation. WebGLayer will be extended with support for line and area features. We will also provide the components for advanced visualisations in the form of multiple linked views, filters through interactive graphs, parallel coordinates relationship analysis, map-screen extent filters, and area selection. We will build on technologies currently used but will also include state-of-the-art new developments in this domain, both in terms of technology, design and layout. Focus will be on visualisation and filtering of mobility information and comparison between different scenario's, time periods and locations.
The support of the visualisation components on mobile and touch devices will be researched because advanced visualisation technology often requires more device resources (RAM, CPU, GPU) and is not always fully compatible with all mobile operating systems and browsers. Where necessary, different strategies for rendering and data handling in web browsers need to be applied after investigating the latest developments in terms of vector data handling and server side rendering.

Task 4.4 Social Media Analytics (ATC (6), GEOS (1), M07 - M30):

Social Media Analytics will be implemented using TruthNest. The tool will be extended with a monitoring mechanism for Twitter content that will automatically and real-time gather trending mobility information and alert the users on possible events. Predefined keywords and hashtags related to mobility are used for following trending discussions but the users will also be able to add their own keywords. We will also research how information from other modules can be utilised in TruthNest and how visualisations of the results can be adapted for easy integration in existing policy making software solutions.

Task 4.5 Metadata support (HSRS (6), AIV (1), GEOS (2), MACQ (2), M07 - M30):
The purpose is to define the metadata requirements for supporting the different tools and processes in decision making. This includes the definition of the structures, services, semantics and standards to support big data, sensors, advanced analytics and linked data. This will be followed by a gap analysis on the existing tools. Next the necessary extensions for the metadata component will be designed and developed. Two open source metadata tools will be considered in the project: GeoNetwork and Micka. The consortium will contribute to the definition of integrated metadata standards in the OGC metadata workgroup.

Task 4.6 Crowdsourcing (P4A (2), HSRS (6), GEOS (1), ATC (2), M07 - M30):
This task foresees the necessary tools, processes and integration of existing crowdsourcing tools (like Waze, plzni.to) to use crowdsourced data and turn it into actionable information to support evidence-based policy making. On the basis of deliverables realised in SDI4APPs, standard interfaces, protocols and data models are implemented. HSRS will extend previous work and will design new modules for the SensLog open source library to support integration of Senslog with big data technologies.

Task 4.7 Automation of traffic modelling tool (P4A (6), INCO (2), EDIP (10), HSRS (2), GEOS (1), M07 - M30):
The OTN traffic modelling tool will be automated and ported to a big data processing cloud which should yield near real-time traffic calculations. We will also calibrate the process and make the traffic model algorithms more accurate (in space and time) using real time and historical traffic sensor data. This task covers the design and implementation of process automation and cloud computing capabilities, the system interfaces and GUI components to interact with the traffic modelling software.

Participation per Partner

Partner number and short name	WP4 effort
1 - AIV	2.00
3 - EDIP	12.00
5 - HSRS	16.00
6 - GEOS	13.00
7 - INCO	14.00
8 - CZD	14.00
10 - ATC	11.00
12 - MACQ	12.00
13 - P4A	10.00
Total	104.00

List of deliverables

Deliverable Number[14]	Deliverable Title	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D4.1	Technical Specifications	6 - GEOS	Report	Public	9

List of deliverables

Deliverable Number[14]	Deliverable Title	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D4.2	Metadata Specifications	5 - HSRS	Report	Public	10
D4.3	Software release for different technical components (1)	6 - GEOS	Demonstrator	Public	14
D4.4	Software release for different technical components (2)	6 - GEOS	Demonstrator	Public	22
D4.5	Privacy rules and data anonymization (White Paper DRAFT)	1 - AIV	Report	Public	24
D4.6	Software release for different technical components (3)	6 - GEOS	Demonstrator	Public	30
D4.7	Privacy rules and data anonymization (White Paper FINAL)	1 - AIV	Report	Public	30

Description of deliverables

D4.1 : Technical Specifications [9]

This technical report describes the overall architecture and how the different components interact. The main purpose of the document is to define best practices and standards for integrating the different technical components in policy making processes and tools.

D4.2 : Metadata Specifications [10]

This technical document describes the metadata requirements (incl. use of standards) for successful application of technical components in policy making processes and tools. The report will also document the gap between those requirements and the most popular open source metadata software.

D4.3 : Software release for different technical components (1) [14]

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D4.4 : Software release for different technical components (2) [22]

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D4.5 : Privacy rules and data anonymization (White Paper DRAFT) [24]

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D4.6 : Software release for different technical components (3) [30]

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D4.7 : Privacy rules and data anonymization (White Paper FINAL) [30]

Peer reviewed white paper.

Schedule of relevant Milestones

Milestone number[18]	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS1	MS1	1 - AIV	6	Pilot plan and evaluation methodology created. Policy experimentation requirements, functional design and technical specifications completed. Communications plan delivered.
MS2	MS2	1 - AIV	12	First versions of technical tools tested in pilots and evaluated (cycle 1). Refinement recommendations for the next cycle consolidated. First draft of Exploitation plan delivered.
MS3	MS3	1 - AIV	21	Refined technical components integrated into functional platform, tested in pilots (cycle 2) and evaluated. Refinement recommendations for the next cycle consolidated. 1st version of PoliVisu Playbox delivered.
MS4	MS4	1 - AIV	29	Third release of technical components integrated, tested in pilots and evaluated. Refinement recommendations for the final cycle consolidated

Work package number [9]	WP5	Lead beneficiary [10]	10 - ATC
Work package title	Components Integration		
Start month	6	End month	33

Objectives

The central focus of PoliVisu is to make it possible for policy makers to access mobility related information and take more informed decisions on policy making. We will make this possible with the modules delivered by WP4 which will be integrated in two different ways:
· For the three pilot cities in the project we will integrate the functionalities of the modules in the systems they already have in operation. In order to make this successful, each pilot city will be assisted by a local IT partner (on top of the WP-lead ATC): CZD for ISSY; P4A/INCO for SITMP(Plzen) and GEOS for Ghent.
· For the sake of demonstration and for other future potential customers who do not wish to use their existing systems, we will build a platform with a dashboard visualisation which will also integrate all functionalities of the WP3 modules For this demonstration platform, we will make use the OpenTransportNet (OTN) hub (http://www.opentransportnet.eu/), an open geo data visualisation platform, build in another EC project (CIP 620533) and is maintained by partner Plan4All as part of the "sustainability" strategy of this project. This work package will oversee the establishment, integration and management of the PoliVisu modules and platform throughout the project. ATC will lead activities in this work package, supported by technical partners who will provide their modules and user partners who will ensure alignment to their requirements to achieve the following objectives:
· Create a fully functioning technical infrastructure with a user-friendly front-end to be customized by authorities
· Provide Visualisation layers and APIs to allow policy makers to understand and use the data available
· Ensure a fully-maintained service which is regularly updated and maintained throughout the project

Description of work and role of partners

WP5 - Components Integration [Months: 6-33]
ATC, HSRS, GEOS, INCO, CZD, MACQ , P4A
Task 5.1 Integration Plan (ATC (3), HSRS (0.5), GEOS (1), INCO (0.5), CZD (0.5), MACQ (0.5), M06 - M30):
This task will involve the preparation of the platform integration plan (D5.1) using input from WP4 about the technical modules and WP3 about the requirements. The plan will detail how and when the individual technical elements will be adapted and integrated in the pilot cities systems and PoliVisu platform. The plan will also detail the interactive functionalities of the platform such as social media-linked discussion fora and annotation elements. Finally a testing and review process will be established to ensure the platform passes key quality tests before being released for use.

Task 5.2 Platform Development (ATC (10), HSRS (3), GEOS (4), INCO (2), CZD (2), MACQ (2), P4A (4), M08 - M30):
This task will use the Integration Plan (D5.1) to ensure a smooth integration of all technical elements into a Policy Making Support Platform for Mobility (D5.2). This will be done both on an independent platform which will be based on the outcome of the OTN project, and on the existing platforms of the pilot cities. Adaptation work will start as soon as specifications are created in order to maximize the use of development time.

This task will also include the development of the platform front end which will be based on the user requirements gathered in WP3. Each type of end-user when accessing the home page of the platform will be directed to the tools and services packaged in a manner that appeals to their needs. The look and feel of the interface will be influenced by the work of WP4 in order to create a harmonic look and feel among all modules. The Interface will include an identification and security layer which will be enhanced based upon the outputs of the discussions with the user community over the course of the project. As a development team, PoliVisu is always up to date with the latest UX design patterns and principles in order to provide the best user experience to our customers. Apart from applying common and well established patterns, PoliVisu will also follow the best practices in usability, regarding every little detail of the application (error messages, wordings, titles, colors, fonts etc.).

Social-media functionality will also be added into the platform. Users will be able to register using existing social media credentials or set up a specific discussion room and be able to interact with others via discussions about mobility issues, needs, solution ideas and/or new opportunities. The open discussions will be facilitated at first by the Consortium to help guide users in understanding the type of support and help they can offer each other in the innovation process. Most important is that this task will involve the careful and considered integration of all components prepared in WP4 into the structure of the platforms to provide fully functional Policy Making Support for Mobility.

Task 5.3 Technical Assessment & Testing (ATC (4), GEOS (1), INCO (1), P4A (1), M12 - M30):
This task will incorporate the testing, review and validation of the platforms by technical partners and relevant third parties. The aim is to ensure the functionality of the platforms before release to the pilot leads for personalisation during the closed user group validation phase. To this end, the principal action will be beta-testing of the infrastructure which will involve load testing, security testing as well as user accessibility and acceptance testing. The technical review will also operate as a feedback process during the closed user group phase of the pilots allowing feedback and changes to be implemented before general release.

Task 5.4 Maintenance, Operation & Updates (ATC (4), HSRS (0.5), GEOS (0.5), INCO (0.5), CZD (0.5), M10 - M33):
To ensure that the continuous support of the platforms, this task will create a plan for the maintenance and (if necessary) updates to be performed during the lifetime of the project. It is expected that maintenance will initially be performed on an ad-hoc basis as bugs are discovered and ironed out during user group testing. All these amendments will be logged and analysed in order to create a coherent ongoing maintenance programme. The pilot cities local IT partners will have a "first line" assistence role, with ATC in the "back-office".

Participation per Partner

Partner number and short name	WP5 effort
5 - HSRS	4.00
6 - GEOS	6.50
7 - INCO	4.00
8 - CZD	3.00
10 - ATC	21.00
12 - MACQ	2.50
13 - P4A	5.00
Total	46.00

List of deliverables

Deliverable Number[14]	Deliverable Title	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D5.1	Technical Integration Plan	6 - GEOS	Report	Public	8
D5.2	Fully Functional Platform	10 - ATC	Demonstrator	Public	14
D5.3	Technical Testing Report 1	10 - ATC	Report	Public	14
D5.4	Technical Testing Report 2	10 - ATC	Report	Public	22
D5.5	Technical Testing Report 3	10 - ATC	Report	Public	30

Description of deliverables

D5.1 : Technical Integration Plan [8]

Plan that outlines the envisioned architecture and the activities that need to be undertaken to ensure successful integration of all the individual elements.

D5.2 : Fully Functional Platform [14]

Fully functional Platforms that are ready to be piloted by each one of the three cities.

D5.3 : Technical Testing Report 1 [14]

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D5.4 : Technical Testing Report 2 [22]

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D5.5 : Technical Testing Report 3 [30]

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Schedule of relevant Milestones

Milestone number[18]	**Milestone title**	**Lead beneficiary**	**Due Date (in months)**	**Means of verification**
MS2	MS2	1 - AIV	12	First versions of technical tools tested in pilots and evaluated (cycle 1). Refinement recommendations for the next cycle consolidated. First draft of Exploitation plan delivered.
MS3	MS3	1 - AIV	21	Refined technical components integrated into functional platform, tested in pilots (cycle 2) and evaluated. Refinement recommendations for the next cycle consolidated. 1st version of PoliVisu Playbox delivered.
MS4	MS4	1 - AIV	29	Third release of technical components integrated, tested in pilots and evaluated. Refinement recommendations for the final cycle consolidated

Work package number [9]	WP6	Lead beneficiary [10]	15 - GENT
Work package title	Pilot Scenarios and Deployment		
Start month	1	End month	36

Objectives

This work package will test-run the Policy Making Model and tools developed within PoliVisu in at least three pilot cities; Issy-les-Moulineaux; Ghent and Plzen. This test-run entails the actual development, implementation and monitoring of local policies in 4 cycles, feeding the results back into the overall project's solutions. WP6 ensures the applicability of these tools and methodologies in a real-world setting. In fact, the pilot cities which will be part of this test run have been chosen such that they each face similar policy challenges (related to mobility) but are sufficiently diverse in terms of decision making processes. This way, the solutions developed by PoliVisu can be applicable for medium-sized cities all over in Europe, where almost half of the European populace resides. The objectives of this work package can thus be summarized as follows:

· To define concrete scenarios for the implementation of new policies in each of the cities, which are in line with the local government's strategy and which will provide solutions to actual challenges.

· Iteratively implement new policies by making use of the PoliVisu tools and methodologies, while continuously feeding back the local results to the project; thus, improving the applicability of the project's solutions.

Description of work and role of partners

WP6 - Pilot Scenarios and Deployment [Months: 1-36]

GENT, AIV, ISSY, HSRS, GEOS, INCO, CZD, 21C, ATC, SITMP, P4A, POLIMI

Task 6.1 Scenario definition (GENT (3), AIV (1), ISSY (1), GEOS (0.5), 21C (1), ATC (1), SITMP (1), M01 - M03):

The cities will define a number of scenarios they wish to pilot. Such scenario's will be based on very concrete real-world challenges, for which they wish to apply novel policy modelling and validation methodologies. Policy makers in each of the cities will detail which information and representation thereof they require to shape future policies.

For each scenario, this task needs to be able to answer

· Who are the decision makers?

· What are the key decision moments?

· What are the differences in data needs regarding role and time? How can big data make a difference?

· Which tools can the decision makers employ to gain better insight into the problem at hand?

· How will the implementation process involve citizens to increase public support

The results of this task will feed into WP3 to drive the development of a consistent methodology for city policy making considering the new possibilities created by the presence of big data and advanced analysis techniques.

The result of this task will also feed into WP4 where they will be translated to concrete technical requirements in terms of

· Data: which data (and data quality) is required to support this scenario

· Tools: which tools can be employed to support decisions for this scenario

Task 6.2 Baseline Analysis (GENT (4), AIV (2), ISSY (3), HSRS (1), GEOS (1), SITMP (1), P4A (2), POLIMI (1), M03 - M07):

The cities will analyse the current situation based on the locally available data at the start of the project. This task entails the sourcing of data from local sources; including non-official sources or data held by third parties, in collaboration with WP4. Based on this data the cities will make a baseline analysis of the potential scenario's, while WP4 will use this pointer to incorporate the local data into the decision support tools. A baseline analysis is paramount to eventually determine the impact of the new policy on a local scale. The results of this task will feed into the PoliVisu methodology development (T3.4: Experiment based City Policy making)

Task 6.3 Policy Experimenting Pilot test cycle 1 (GENT (3), AIV (1), ISSY (4), HSRS (1), GEOS (1), INCO (1), CZD (1), ATC (1), SITMP (4), P4A (2), M07 - M12):

For each of the policy decisions that have been modelled in T3.4, the pilots will employ the tools provided through the project to estimate the policy's impact and perception. New visualisation and analysis tools developed in WP4 will allow decision makers to quickly and interactively come to an informed decision.

Task 6.4 Policy Experimenting Pilot test cycle 2 (GENT (3), AIV (1), ISSY (4), HSRS (1), GEOS (0.5), INCO (1), CZD (1), ATC (1), SITMP (4), P4A (2), M15 - M20):

Re-run the test cycle.

Task 6.5 Policy Experimenting Pilot test cycle 3 (GENT (3), AIV (1), ISSY (4), HSRS (1), GEOS (0.5), INCO (1), CZD (1), ATC (1), SITMP (4), P4A (2), M23 - M28):
Re-run the test cycle.

Task 6.6 Policy Experimenting Pilot test cycle 4 (GENT (3), AIV (1), ISSY (4), HSRS (1), GEOS (0.5), INCO (1), CZD (1), ATC (1), SITMP (4), P4A (2), M31 - M35):
Re-run the test cycle.

Task 6.7 Policy implementation and compliance monitoring (GENT (1), AIV (2), ISSY (1), GEOS (1), SITMP (1), P4A (1), POLIMI (1), M07 - M36):
This task entails the actual implementation of the selected policies on the city level, including gaining public support, organising the decision-making process, and coordinating the city's departments or subcontractors to implement the new policy in such a way that its impact can also be measured and fed back into the project. The perception of the policy will be measured by employing - among other means - the sentiment analysis tools which have been developed in WP4. These tools can also be used to monitor compliance. This task will feed into the overall project evaluation (WP7)

Participation per Partner

Partner number and short name	WP6 effort
1 - AIV	9.00
4 - ISSY	21.00
5 - HSRS	5.00
6 - GEOS	5.00
7 - INCO	4.00
8 - CZD	4.00
9 - 21C	1.00
10 - ATC	5.00
11 - SITMP	19.00
13 - P4A	11.00
14 - POLIMI	2.00
15 - GENT	20.00
Total	106.00

List of deliverables

Deliverable Number[14]	Deliverable Title	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D6.1	Pilot Scenarios	15 - GENT	Report	Public	3
D6.2	Baseline Analyses	15 - GENT	Report	Public	7
D6.3	Policy implementation and compliance report	15 - GENT	Report	Public	35
D6.4	Final Report	15 - GENT	Report	Public	36

Description of deliverables

D6.1 : Pilot Scenarios [3]

1 set of scenarios for each of the pilot cities

D6.2 : Baseline Analyses [7]

1 baseline analysis for each of the pilot cities

D6.3 : Policy implementation and compliance report [35]

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D6.4 : Final Report [36]

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Schedule of relevant Milestones

Milestone number[18]	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS1	MS1	1 - AIV	6	Pilot plan and evaluation methodology created. Policy experimentation requirements, functional design and technical specifications completed. Communications plan delivered.
MS2	MS2	1 - AIV	12	First versions of technical tools tested in pilots and evaluated (cycle 1). Refinement recommendations for the next cycle consolidated. First draft of Exploitation plan delivered.
MS3	MS3	1 - AIV	21	Refined technical components integrated into functional platform, tested in pilots (cycle 2) and evaluated. Refinement recommendations for the next cycle consolidated. 1st version of PoliVisu Playbox delivered.
MS4	MS4	1 - AIV	29	Third release of technical components integrated, tested in pilots and evaluated. Refinement recommendations for the final cycle consolidated

Work package number [9]	WP7	Lead beneficiary [10]	4 - ISSY
Work package title	Policy Impact and Evaluation		
Start month	1	End month	36

Objectives

This work package will be performed under the responsibility of ISSY who has an extensive experience (as a digital innovation Living Lab) with the evaluation of innovation projects. The key objectives of this work package are: (1) identify methodology (both qualitative and quantitative) to be used for assessing the impact of the project and its pilots, (2) regularly monitor and assess the impact of the PoliVisu solutions on the policy making in the pilot, (3) provide technical and operational recommendations for the effective use of big & open data in policy making and (4) provide final evaluation of the pilots against project objectives and requirements defined in WP3.

Description of work and role of partners

WP7 - Policy Impact and Evaluation [Months: 1-36]
ISSY, AIV, GEOS, 21C, SITMP, POLIMI, GENT
Task 7.1 Evaluation Methodology & Planning (ISSY (1), AIV (1), GEOS (1), 21C (1), SITMP (1), POLIMI (1), GENT (1), M01 - M06):
In order to examine systematically the acceptance and value of the PoliVisu solution in general, as well as the main determinants (i.e. factors affecting levels of acceptance), the Consortium will define the exact methodology to be used. Among others the following methods are foreseen: Focus Groups, 'Expert Lens' interviews, Questionnaires...
Data gathered from the focus groups, questionnaires and interviews will be processed. Following analysis of technical requirements, respective evaluation metrics will be produced and operational data will be gathered. Based upon the outcomes of the evaluation techniques above, recommendations and conclusions will be formulated.
The evaluation methodology will be built into the pilot operations plan and the evaluation plan will be broken down into several iterations matching the pilot cycles (WP6). The methodology will be defined closely in conjunction with WP3 Policy & User Requirements and Methodology.
Participating Partners: ISSY will create the evaluation methodology and plan with the contribution from POLIMI and support of the pilot sites.

Task 7.2 Policy Impact Monitoring, Assessment and Validation (cycle 1) (ISSY (3), AIV (1), 21C (2), SITMP (1), POLIMI (1), GENT (1), M08 - M12):
This task will cover a regular monitoring and assessment of the impact of the PoliVisu solutions on the policy making process in the pilots.
Based upon the results of the statistical processing of the data from the quantitative research and the soft results from the qualitative results of the surveys (as defined in the T7.1 methodology), conclusions will be drawn in several iterations following the pilot cycles as to (1) which are the main determinants of the acceptance and use of the PoliVisu solution, (2)which are its weaknesses, (3)which need improvements, and (4) what are the best conditions for future deployments. Result outcomes will be regularly fed back into the pilot process. An expert panel composed of acknowledged experts in policy making, big and open data, e-government, smart cities and geospatial standardisation will be established within the task. The experts will provide their expert feedback on the assessment and validation of the pilots.

Task 7.3 Policy Impact Monitoring, Assessment and Validation (cycle 2) (ISSY (1), AIV (1), SITMP (1), POLIMI (1), GENT (1), M16 - M21):
Re-run the validation cycle.

Task 7.4 Policy Impact Monitoring, Assessment and Validation (cycle 3) (ISSY (1), AIV (1), SITMP (1), POLIMI (1), GENT (1), M24 - M29):
Re-run the validation cycle.

Task 7.5 Policy Impact Monitoring, Assessment and Validation (Final cycle) (ISSY (1), AIV (1), SITMP (1), POLIMI (1), GENT (1), M32 - M36):
Re-run the validation cycle.

Task 7.6 Recommendations for big & open data use in policy making (ISSY (1), AIV (1), SITMP (1), POLIMI (1), GENT (1), M22 - M36):
Based on the stakeholders input captured in WP3 and lessons-learned from the T7.3 recommendations, a hands-on manual focused on big and open data use in policy making will be drafted (in two iterations), including a short video.

The expert panel will be involved in the process of the recommendations formulation in order to deliver practical and hand-on guidance on the big data use to the policy makers. Participating Partners: ISSY will lead the task with the contribution from POLIMI and the pilot sites. AIV will be responsible for the expert panel involvement.

Task 7.7 Final Pilot Evaluation (ISSY (4), AIV (2), SITMP (1), POLIMI (1), GENT (1), M31 - M36):
The final evaluation of the PoliVisu pilots will be conducted within this task. Pilot sites results will be benchmarked with the original policy and user requirements captured in the WP3, key findings of the pilots resulting from the tasks T7.2 and T7.3 will be summarised, and the overall success of the project will be assessed against the project objectives. Participating Partners: ISSY will lead the task with the contribution from POLIMI and review of the pilot sites.

Participation per Partner

Partner number and short name	WP7 effort
1 - AIV	8.00
4 - ISSY	12.00
6 - GEOS	1.00
9 - 21C	3.00
11 - SITMP	7.00
14 - POLIMI	7.00
15 - GENT	7.00
Total	45.00

List of deliverables

Deliverable Number[14]	Deliverable Title	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D7.1	Evaluation Plan	4 - ISSY	Report	Public	6
D7.2	Recommendation for future deployments (It. 1)	4 - ISSY	Report	Public	12
D7.3	Recommendation for future deployments (It. 2)	4 - ISSY	Report	Public	21
D7.4	Big & Open Data Use in Policy Making Manual (DRAFT)	4 - ISSY	Report	Public	24
D7.5	Recommendation for future deployments (It. 3)	4 - ISSY	Report	Public	29
D7.6	Big & Open Data Use in Policy Making Manual (Final)	4 - ISSY	Report	Public	32
D7.7	Final Evaluation Report	4 - ISSY	Report	Public	36

Description of deliverables

D7.1 : Evaluation Plan [6]
Plan outlining the monitoring techniques and evaluation methodology including a schedule for data collection.

D7.2 : Recommendation for future deployments (It. 1) [12]

Specific recommendations for refinements of the pilot solutions based on the regular monitoring and assessment of the impact of PoliVisu solutions on the policy making process in the pilots.

D7.3 : Recommendation for future deployments (It. 2) [21]

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D7.4 : Big & Open Data Use in Policy Making Manual (DRAFT) [24]

First release of a visually engaging hands-on manual (fit for web use and publication), with a script of an accompanying short video, focused on big and open data use in policy making.

D7.5 : Recommendation for future deployments (It. 3) [29]

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D7.6 : Big & Open Data Use in Policy Making Manual (Final) [32]

Final release

D7.7 : Final Evaluation Report [36]

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Schedule of relevant Milestones

Milestone number[18]	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS1	MS1	1 - AIV	6	Pilot plan and evaluation methodology created. Policy experimentation requirements, functional design and technical specifications completed. Communications plan delivered.
MS2	MS2	1 - AIV	12	First versions of technical tools tested in pilots and evaluated (cycle 1). Refinement recommendations for the next cycle consolidated. First draft of Exploitation plan delivered.
MS3	MS3	1 - AIV	21	Refined technical components integrated into functional platform, tested in pilots (cycle 2) and evaluated. Refinement recommendations for the next cycle consolidated. 1st version of PoliVisu Playbox delivered.
MS4	MS4	1 - AIV	29	Third release of technical components integrated, tested in pilots and evaluated. Refinement recommendations for the final cycle consolidated

Schedule of relevant Milestones

Milestone number[18]	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS5	MS5	1 - AIV	36	Manual on big data use in policy making published, pilot final cycle evaluated, exploitation strategy defined, final version of PlayBox released, final results disseminated.

Work package number [9]	WP8	Lead beneficiary [10]	9 - 21C
Work package title	Dissemination, Exploitation and Standardisation		
Start month	1	End month	36

Objectives

WP8 aims at deploying outreach strategies to ensure (a) general awareness raising of PoliVisu, and the use of data for policy modelling, across Europe, as well as (b) targeting results to specific audiences in order to increase impact and achieve a sustainable future for the project.

· Raise general awareness on the themes and results of PoliVisu among non-specialist audiences
· Use targeted activities to engage and influence specific stakeholder groups to use and adopt PoliVisu's innovative Playbox and results
· Deploy standardisation activities as an additional mechanism for exploitation and dissemination of project results as well as identifying relevant standards to enrich technical work packages.
· Define business oriented exploitation approaches for the project's value opportunities, business models and business plans basics. Establish consortium's individual and collaborative strategies.

Description of work and role of partners

WP8 - Dissemination, Exploitation and Standardisation [Months: 1-36]
21C, AIV, ISP, EDIP, ISSY, HSRS, GEOS, INCO, CZD, ATC, SITMP, MACQ , P4A, POLIMI, GENT
Task 8.1 Impact Enhancement Roadmap (21C (3), AIV (2), ISP (1), ATC (1), M01 - M02):
This crucial first task involves the setup and maintenance of an impact enhancement roadmap. The easy to follow document will bridge the separate communication, dissemination and exploitation activities covered in this WP with an overarching strategy to form a holistic approach to all levels of promotion, helping partners understand what type of engagement is needed, why, where, when and how. A draft roadmap reflecting the overall strategy of all promotional tools and activities has already been outlined (see Section 2.2 of the Annex 1, Part B). The roadmap itself consists of a target audience and interests matrix along with a set of strategies with detailed activity tables per project phase. The Roadmap will not only guarantee communication and dissemination happens at the right times for the right purposes but will ensure all planned activities are monitored to assess performance so future tactics can be updated and refined based on feedback.
Task 8.2 Communication and Dissemination Campaigns (21C (6), AIV (2), EDIP (1), ISP (2), ISSY (1), HSRS (1), GEOS (1), INCO (1), CZD (1), ATC (1), SITMP (1), MACQ (1), P4A (1), POLIMI (1), GENT (1), M01 - M36):
This task covers both general awareness raising and information sharing (Dissemination) and more detailed result/ impact generation tailored to specific audiences (Communication).
1. Dissemination Campaign:,key actions include: PoliVisu identity and branding, website and online presence, dissemination activities...
2. Communication campaign: targeted events, cross-project activities, networking on regional and EU institutional level, final dissemination event.

Task 8.3 Standardization activities (AIV (5), EDIP (0.5), ISP (1), ISSY (1), HSRS (1), GEOS (1), INCO (1), CZD (1), 21C (1), ATC (1), SITMP (1), MACQ (1), P4A (1), POLIMI (1), GENT (1), M01 - M36):
The main objective of this task is to facilitate the acceptance and utilisation by the market of the PoliVisu solution. Other objectives are to provide starting information for WP3, WP4 and WP5, to ensure compatibility and interoperability with what already exists in the market through standards, as well as to use the standardization system as a tool for dissemination of the project results and interaction with the market stakeholders. The following subtasks are envisaged: (1) Identification of related applicable existing standards, (2) contribution to the ongoing and future standardization developments. A strategy for the communication with the previously identified standardization organizations and technical committees will be elaborated. In order to facilitate and promote the inclusion of the outcomes of the project in future new or revised standards that can be easily used by the European or international industry, this activity will feed the selected standardization organizations and committees with specific standardization proposals, ready for discussion and inclusion in the future development of new standards or into revised ones. The contents to be proposed will be consequent with the IPR strategy of the project.

Task 8.4 Business model design and exploitation plan definition (P4A (1), AIV (2), ISP (2), 21C (6), ATC (1), SITMP (1), MACQ (1), POLIMI (1), GENT (1), M09 - M36):

4 sub-tasks:
1. Business Rationale of PoliVisu: this task will devise a sound rationale for creating, delivering and appropriating value through the commercialisation of the key technological result of the PoliVisu
2. Playbox: This sub-task involves the packaging of PoliVisu outcomes into an easy to use toolkit that policymakers can adopt for policy experimentation. Elements of the Playbox include:
· PoliVisu Framework - in quick and easy to understand online format
· PoliVisu Stories - engaging video case studies that showcase the business case/benefits of PoliVisu
· PoliVisu Tools - embedded examples of what can be done with the visualisation tools with links to a) open source components and b) partners who can help you adopt the tools
3. Training: PoliVisu adopts a free training programme during the course of the project to ensure that the skills needed for using data for policy making are transferred to public administrations across Europe.
4. Exploitation: This sub-task focuses on (a) putting the business plan into action before the end of the project, and (b) also sharing the non-commercial results from the project to ensure the project delivers value for money and continues to have influence across the whole policy making value chain.

Participation per Partner

Partner number and short name	WP8 effort
1 - AIV	11.00
2 - ISP	6.00
3 - EDIP	1.50
4 - ISSY	2.00
5 - HSRS	2.00
6 - GEOS	2.00
7 - INCO	2.00
8 - CZD	2.00
9 - 21C	16.00
10 - ATC	4.00
11 - SITMP	3.00
12 - MACQ	3.00
13 - P4A	3.00
14 - POLIMI	3.00
15 - GENT	3.00
Total	63.50

List of deliverables

Deliverable Number[14]	Deliverable Title	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D8.1	Impact Enhancement Roadmap	9 - 21C	Report	Public	2
D8.2	Standards White Paper Ed. 1	1 - AIV	Report	Public	12

List of deliverables

Deliverable Number[14]	Deliverable Title	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D8.3	Business and Exploitation Plan 1	9 - 21C	Report	Public	12
D8.4	PoliVisu Playbox 1	9 - 21C	Report	Public	14
D8.5	Standards White Paper Ed. 2	1 - AIV	Report	Public	24
D8.6	Updated Business and Exploitation Plan 2	9 - 21C	Report	Public	24
D8.7	PoliVisu Playbox 2	9 - 21C	Report	Public	26
D8.8	PoliVisu Training Module	9 - 21C	Report	Public	28
D8.9	Standards White Paper Ed. 3	1 - AIV	Report	Public	34
D8.10	Updated Business and Exploitation Plan 3	9 - 21C	Report	Public	34
D8.11	PoliVisu Playbox 3	9 - 21C	Report	Public	36

Description of deliverables

D8.1 : Impact Enhancement Roadmap [2]

An overarching strategy to ensure dissemination, communication and exploitation plans are linked and executed in harmony. Initial versions of each of the three plans will be included here.

D8.2 : Standards White Paper Ed. 1 [12]

First edition of standards white paper

D8.3 : Business and Exploitation Plan 1 [12]

Plans for exploitation of PoliVisu outputs including any joint commercialisation activities related to PoliVisu's technical tools.

D8.4 : PoliVisu Playbox 1 [14]

The outcomes from PoliVisu packaging the tools and methodologies for policy experimentation in an engaging and easy-to-adopt manner.

D8.5 : Standards White Paper Ed. 2 [24]

Second edition of standards white paper

D8.6 : Updated Business and Exploitation Plan 2 [24]

Revised plans for exploitation of PoliVisu outputs.

D8.7 : PoliVisu Playbox 2 [26]

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D8.8 : PoliVisu Training Module [28]

Training materials including slides, videos, and interactive exercises for building skills in using data for policy making

D8.9 : Standards White Paper Ed. 3 [34]

3rd edition of standards white paper

D8.10 : Updated Business and Exploitation Plan 3 [34]

Revised plans for exploitation of PoliVisu outputs.

D8.11 : PoliVisu Playbox 3 [36]

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Schedule of relevant Milestones

Milestone number[18]	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS1	MS1	1 - AIV	6	Pilot plan and evaluation methodology created. Policy experimentation requirements, functional design and technical specifications completed. Communications plan delivered.
MS3	MS3	1 - AIV	21	Refined technical components integrated into functional platform, tested in pilots (cycle 2) and evaluated. Refinement recommendations for the next cycle consolidated. 1st version of PoliVisu Playbox delivered.
MS5	MS5	1 - AIV	36	Manual on big data use in policy making published, pilot final cycle evaluated, exploitation strategy defined, final version of PlayBox released, final results disseminated.

1.3.4. WT4 List of milestones

Milestone number[18]	Milestone title	WP number[9]	Lead beneficiary	Due Date (in months)[17]	Means of verification
MS1	MS1	WP2, WP3, WP4, WP6, WP7, WP8	1 - AIV	6	Pilot plan and evaluation methodology created. Policy experimentation requirements, functional design and technical specifications completed. Communications plan delivered.
MS2	MS2	WP3, WP4, WP5, WP6, WP7	1 - AIV	12	First versions of technical tools tested in pilots and evaluated (cycle 1). Refinement recommendations for the next cycle consolidated. First draft of Exploitation plan delivered.
MS3	MS3	WP3, WP4, WP5, WP6, WP7, WP8	1 - AIV	21	Refined technical components integrated into functional platform, tested in pilots (cycle 2) and evaluated. Refinement recommendations for the next cycle consolidated. 1st version of PoliVisu Playbox delivered.
MS4	MS4	WP3, WP4, WP5, WP6, WP7	1 - AIV	29	Third release of technical components integrated, tested in pilots and evaluated. Refinement recommendations for the final cycle consolidated
MS5	MS5	WP2, WP7, WP8	1 - AIV	36	Manual on big data use in policy making published, pilot final cycle evaluated, exploitation strategy defined, final version of PlayBox released, final results disseminated.

1.3.5. WT5 Critical Implementation risks and mitigation actions

Risk number	Description of risk	WP Number	Proposed risk-mitigation measures
1	Project execution risks: Key milestones or critical deliverables are delayed.	WP2	Continuous analysis of the dependences established between WP's and outcomes will be monitored on a weekly basis.
2	The pilot use cases cannot be implemented due to technical, political, administrative or regulatory issues.	WP2	Close communication among the project management, technical partners, and the pilots must be set up to find as quickly as possible solutions, and to establish a relevant action plan. In case this plan fails, it is possible to determine an alternative for the pilot location, and if necessary, a change in the description of action will be requested.
3	Policy models don't match the reality of local government in mid-sized city	WP3	Short feed-back loop with pilot cities will be established to regularly adjust the policy models to the real needs of pilots
4	Difficulties when interacting with policy makers and to produce clear requirements	WP3	Functional analysis and design task has been introduced in the WP2 workplan to bridge the gap between user requirements and technical specifications. Establish closer connection and support interaction between policy makers and developers.
5	Limitations of using advanced data visualisation libraries on devices with limited resources (tablets, smartphones)	WP4	Leverage alternative strategies for data rendering and visualisation in web browsers like tile based vector data handling or server side rendering. Refine the libraries to improve user experience on touch-screen devices.
6	Privacy concerns: Use of big data causes privacy issues, esp. when a lot of detail is required for certain analytics.	WP4	The potential conflict with respect to privacy will be studied. The big data can be categorized in levels of (personal) detail. Ways to anonymize data will be proposed and for each level of anonymization the achievable analytics use cases will be listed.
7	Functionalities do not meet the requirements of policy makers. Thereby the end solution is not accepted, user satisfaction is at a low score.	WP5	A complete coordinated and user-oriented implementation plan is followed to avoid misspecification. Focus on a user centric design and validation approach, with emphasis on continuous iterations of requirements, development and validation activities. A complete coordinated and user-oriented implementation plan is followed.
8	Development risks related to shifts in state-of-the-art activities or the appearance of a disruptive technology, that affect the envisaged innovation and the project's time plan	WP5	The Technical Director reviews technical and business aspects of the project to set directions. Technologies developed will be platform-agnostic to the greatest extent possible and thus flexibly adaptable to a changing environment.
9	Local decision making process (e.g. opposition questions or other	WP6	Careful selection of scenarios that are feasible will be done in T5.1 together with civil servants in each of cities as to make sure they are

Risk number	Description of risk	WP Number	Proposed risk-mitigation measures
	unexpected circumstances) does not allow the new policy to be implemented in time.		implementable within the required timeframe. Also, a set of alternatives will be selected.
10	Low levels of users' involvement: Test user response is limited resulting in insufficient feedbacks from users.	WP7	A continuous collaboration with WP5 and WP7 will be set to lower the risk. This will include also a complete toolkit provided to pilots to maximise the number of feedbacks and avoid losses of possible contributors. Living lab expertise and user base will be used by pilots. Continuous monitoring and intermediate reports will allow to identify any critical points. Collaboration with pilot activities related WP will be set to allow pilots to involve all the right local stakeholders to maximise the participation at local level, such as local associations with a specific interest in sustainable mobility.
11	Delay in performing and/or low impact of the dissemination activities.	WP8	Detailed communications plan will be a part of the D7.1. Dissemination activities will start at the beginning of the project according to the plan to mitigate any risk of delay. A continuous monitoring and impact evaluation will be done in order to ensure impact, corrective action will be taken where necessary.

1.3.6. WT6 Summary of project effort in person-months

	WP1	WP2	WP3	WP4	WP5	WP6	WP7
1 - AIV		9	2.60	2	0	9	8
· EVIV	0	0	0	0	0	0	
2 - ISP		23	0	0	0	0	0
3 - EDIP		1.10	0.50	12	0	0	0
4 - ISSY		2.70	3.50	0	0	21	12
5 - HSRS		1.10	0.50	16	4	5	0
6 - GEOS		2.10	1.50	13	6.50	5	1
7 - INCO		1.10	0.50	14	4	4	0
8 - CZD		1.10	2.50	14	3	4	0
9 - 21C		3	12.50	0	0	1	3
10 - ATC		2.60	1.10	11	21	5	0
11 - SITMP		1.20	1.60	0	0	19	7
12 - MACQ		1.10	0.50	12	2.50	0	0
13 - P4A		1.10	1.10	10	5	11	0
14 - POLIMI		2.60	18	0	0	2	7
15 - GENT		2.70	11	0	0	20	7
Total Person/Months		55.50	57.40	104	46	106	45

1.3.7. WT7 Tentative schedule of project reviews

Review number [19]	Tentative timing	Planned venue of review	Comments, if any
RV1	15	TBD	
RV2	36	TBD	

1. Project number

The project number has been assigned by the Commission as the unique identifier for your project. It cannot be changed. The project number **should appear on each page of the grant agreement preparation documents (part A and part B)** to prevent errors during its handling.

2. Project acronym

Use the project acronym as given in the submitted proposal. It can generally not be changed. The same acronym **should appear on each page of the grant agreement preparation documents (part A and part B)** to prevent errors during its handling.

3. Project title

Use the title (preferably no longer than 200 characters) as indicated in the submitted proposal. Minor corrections are possible if agreed during the preparation of the grant agreement.

4. Starting date

Unless a specific (fixed) starting date is duly justified and agreed upon during the preparation of the Grant Agreement, the project will start on the first day of the month following the entry into force of the Grant Agreement (NB : entry into force = signature by the Commission). Please note that if a fixed starting date is used, you will be required to provide a written justification.

5. Duration

Insert the duration of the project in full months.

6. Call (part) identifier

The Call (part) identifier is the reference number given in the call or part of the call you were addressing, as indicated in the publication of the call in the Official Journal of the European Union. You have to use the identifier given by the Commission in the letter inviting to prepare the grant agreement.

7. Abstract

8. Project Entry Month

The month at which the participant joined the consortium, month 1 marking the start date of the project, and all other start dates being relative to this start date.

9. Work Package number

Work package number: WP1, WP2, WP3, ..., WPn

10. Lead beneficiary

This must be one of the beneficiaries in the grant (not a third party) - Number of the beneficiary leading the work in this work package

11. Person-months per work package

The total number of person-months allocated to each work package.

12. Start month

Relative start date for the work in the specific work packages, month 1 marking the start date of the project, and all other start dates being relative to this start date.

13. End month

Relative end date, month 1 marking the start date of the project, and all end dates being relative to this start date.

14. Deliverable number

Deliverable numbers: D1 - Dn

15. Type

Please indicate the type of the deliverable using one of the following codes:

R	Document, report
DEM	Demonstrator, pilot, prototype
DEC	Websites, patent fillings, videos, etc.
OTHER	
ETHICS	Ethics requirement
ORDP	Open Research Data Pilot

16. Dissemination level

Please indicate the dissemination level using one of the following codes:

PU Public
CO Confidential, only for members of the consortium (including the Commission Services)
EU-RES Classified Information: RESTREINT UE (Commission Decision 2005/444/EC)
EU-CON Classified Information: CONFIDENTIEL UE (Commission Decision 2005/444/EC)
EU-SEC Classified Information: SECRET UE (Commission Decision 2005/444/EC)

17. Delivery date for Deliverable

Month in which the deliverables will be available, month 1 marking the start date of the project, and all delivery dates being relative to this start date.

18. Milestone number

Milestone number:MS1, MS2, ..., MSn

19. Review number

Review number: RV1, RV2, ..., RVn

20. Installation Number

Number progressively the installations of a same infrastructure. An installation is a part of an infrastructure that could be used independently from the rest.

21. Installation country

Code of the country where the installation is located or IO if the access provider (the beneficiary or linked third party) is an international organization, an ERIC or a similar legal entity.

22. Type of access

VA if virtual access,
TA-uc if trans-national access with access costs declared on the basis of unit cost,
TA-ac if trans-national access with access costs declared as actual costs, and
TA-cb if trans-national access with access costs declared as a combination of actual costs and costs on the basis of unit cost.

23. Access costs

Cost of the access provided under the project. For virtual access fill only the second column. For trans-national access fill one of the two columns or both according to the way access costs are declared. Trans-national access costs on the basis of unit cost will result from the unit cost by the quantity of access to be provided.

History of Changes

Date	Changes compared with the proposal or with previous versions of Annex 1
28 Aug 2017	• the Coordinator's short name changed from CORVE to AIV • Introduced the AIV's Linked 3rd Party (EVIV - Eigen Vermogen Informatie Vlaanderen) • renumbered all the Work Packages, Tasks and Deliverables to reflect the introduction of the new WP1 on Ethics both in the text and in the figures • Changed to two review periods (12+24 months) from the original three (3x12 months) • Added the list of tasks that might not be delegated by the Coordinator in the section 3.2.1 • Updated the 3.2.1 Organisational Structure to match the Consortium Agreement's structure and terminology (based on DESCA template) ○ 'Project Director' renamed to the 'Coordinator' ○ Added General Assembly responsibilities ○ Updated Management Committee responsibilities distinguished from the GA ones • Deliverables changes ○ reordered to be numbered in the chronological order ○ removed the three periodical reports 'Progress Report and Financial Statements Period 1-3' ○ introduces a new deliverable 'Intermediate Status Report' in M18 ○ changed the dissemination level of the project management and quality & risk management deliverables (D2.2, D2.3, D2.5, D2.8, D2.9) to 'CO' ○ corrected the error in lead beneficiary for D8.5 and D8.9 to AIV (from 21C) and D4.2 lead from CZD to HSRS ○ introduced the D2.10-D2.13 Data management plan (4 iterations) • corrected the error in the task lead (T4.6 from INCO to P4A) • added the missing link of WP5 to milestones 2-4 • updated partners' short names in the Section 4 • updated Gantt chart • Expert Panel tasks added (section 3.4.3 Subcontracting) and Expert panel text updated (last page of section 4.1) • updated the ISP's role in the project (section 4.1) to be in line with Art 41.2 • EC's pre-grant and post-grant requirements on ethics included in the Section 5.1 Ethics • UX design expertise added in the WP5/T5.2 description
30 Aug 2017	• EVIV profile added to the section 4.1 (under AIV) and EVIV introduced in section 4.2 as AIV's linked third party

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Figures

1. Excellence

1.1 Objectives

PoliVisu is a Research and Innovation project designed to evolve the traditional public policy making cycle (outlined by Patton & Sawicki[1]) using big data. The aim is to enhance an open set of digital tools to leverage data to help public sector decision-making become more democratic by (a) **experimenting with different policy options through impact visualisation** and (b) **using the resulting visualisations to engage and harness the collective intelligence of policy stakeholders for collaborative solution development.**

Working with three cities to address societal problems linked to **smart mobility** and **urban planning**, the intention is to enable public administrations to respond to urban challenges by enriching the policy making process with opportunities for policy experimentation at three different steps of the policy cycle (policy design, policy implementation, and policy evaluation). **Experimentation of policy options will enable the cities to tackle complex, systemic policy problems that require innovative thinking to develop transformative solutions.**

PoliVisu believes that over the next decade cities will experience a paradigm shift in the way cities are governed thanks to an explosion of data and enabling technologies such as blockchain, artificial intelligence and cognitive computing. Today, however, many cities are just at the start of the transformation journey. A recent Forrester report found that only 12% of city data is analysed and used for decision-making and management, currently leaving 88% untouched[2]. It follows that whilst cities are data-rich environments, they lack a) the technical skills and knowledge needed to make sense of the data, and b) the principles and protocols to use the data morally and ethically to make decisions. Recognising these challenges **PoliVisu** sets out to provide public administrations not just with tools (described in Chapter 1.3) for open evidence-based policy-making, but also with a broader understanding of the methodology and implications of how to use data to enhance the democratic value of policies. To achieve its aims **PoliVisu** has two complementary objectives, each with a set of sub-objectives:

Objective	Measurement (outcome)	Success Criteria (output)	Mile-stone
1. **Establish the use of big data and visualisations as an integral part of policy making through the evolvement and implementation of a PoliVisu Playbox for policy experimentation**			
1.1 Review, understand and address challenges presented in the	● No. Expert Lens interviews ● No. End user questionnaires	● Min 20 Interviews ● 40 survey participants	MS1

[1] https://www.researchgate.net/figure/260579927_fig1_Fig-1-Policy-Analysis-Cycle-Patton-and-Sawicki-1993

[2] http://datasmart.ash.harvard.edu/news/article/analytics-excellence-roadmap-866

relationship between big data, open data and policy	● No. Focus groups for requirements ● Identification of challenges	● 2 workshops per pilot ● Complete network map	
1.2 Use research findings to create a smarter, systemic and transferable model of data-driven policymaking	● Quality of the model ● Acceptance of the model ● Satisfaction of the model	● Covers all end user needs ● 80% acceptance ● 90% satisfaction	MS3
1.3 Adapt and enhance tried and tested visualisation tools to be used with various data (historic, real-time and social media) to showcase policy decisions/impact	● No. visualisation types ● Types of data used ● No. datasets utilised ● Clarity of impact ● Openness of tools	● 5 visualisation types ● Use of all data types in bid ● Min 15 datasets utilised ● 70% understanding levels ● Links to tools source code	MS4
1.4 Package enhanced policy model framework and tools into the online **PoliVisu Playbox** for public policy experimentation	● Simplicity of understanding ● Ease of access ● Positive feedback ● Increased skills capacity	● Passes usability tests ● Passes user acceptance ● Optimised for mobile ● Meets accessibility levels	MS2, MS3, MS4
1.5 Provide real-world conditions in three cities for citizens and policymakers to test out transport-related (mobility) policy issues using the **PoliVisu** Tools	● Acceptance of the tools ● Satisfaction of the tools ● No, stakeholders collaborating ● No. policy options explored ● No. policy decisions made	● 90% min acceptance ● 80% min satisfaction ● 100 collaborators ● 30 options explored ● 12 policy decisions	MS5
2. **Ensure sustainability and impact through the scalability and transferability of outcomes**			
2.1 Package technology, techniques and protocols into a skills building module for cities with no experience using data for policy decisions	● No. accredited trainers ● Quality of instructional design ● Proof of concept tested ● Feedback from trainers	● 3 trainers trained ● Interactive exercises ● Webinar with each pilot ● 90% trainer satisfaction	MS4
2.2 Refine module through free initial training days in conjunction with well-known European conferences to upskill public administration's in using data for policy making	● No. conferences engaged ● No. people trained ● Satisfactions with training ● Levels of increased understanding ● Transferability of learning	● Training at 2 conferences ● Min 20 people upskilled ● 90% satisfaction ● 90% skills improvement ● 60% transfer feedback	MS5
2.3 Create exploitation/business model to further offer **PoliVisu** as 'On-demand' tools for policy experimentation	● Meets end users' needs ● Collaboration with partners ● Realism of business model ● Feedback from business experts	● Tested with end users ● Feedback from all partners ● Based on real evidence ● Reviewed by 3 experts	MS5
2.4 Develop success stories from the pilot sites that highlight the benefits business case of using **PoliVisu** to incentivise adoption by new cities	● No. case studies created ● Key messages evidenced ● No. cities targeted ● No. new cities ready to adopt	● 3 case studies delivered ● Data/stats incorporated ● 300 cities contacted ● 3 new cities ready to adopt	MS5

1.2 Relation to the work programme

The call asks for projects that help public administrations utilise opportunities offered by big data for increasing the quality of its policies. The table below highlights how **PoliVisu** aligns to the Work Program.

Requirement	Alignment
Methodological development for using big data in policy development, examining the	● PoliVisu maps the required practices, implications of, and barriers to using big/open data use in policy making

extent to which policy-making structures and systems are ready to absorb and analyse big data;	• PoliVisu reviews the policy making lifecycle and identifies areas where big data and visualisation technology can speed up processes and improve outcomes • PoliVisu develops solutions that integrates the use of data in the process of policymaking in a way that can be easily adopted by Public Administrations
Critical interdisciplinary assessment of the economic, political, epistemological, ethical and legal premises and implications of big data practices (including algorithmic governance, smart cities, etc.), allowing for reflection on the potential benefits and risks;	• PoliVisu undertakes network analysis to understand the state-of-the-art in using big data for policy making • PoliVisu interviews a range of policy actors to understand the barriers they face - economic, political, epistemological, ethical, legal - in using data for policy • PoliVisu analyses the policy actor feedback to extrapolate and categorise the main barriers and risks they face and the potential benefits to be gained • PoliVisu runs co-creation workshops with policy makers to develop enhanced policy-making processes, and to shape and test policy visualisation tools
Develop scalable and transferable methods and re-usable tools for compilation, analysis and visualisation of data, including relevant open, official or certified data;	• PoliVisu evolves existing tools for the visualisation of location based open data for use with specific policy challenges • PoliVisu ensures scalability by testing tools with big data and real-time data streams in Living Lab style demonstrator environments in 3 cities • PoliVisu delivers re-use of tools and methods through the deployment of a PoliVisu Playbox for policy experimentation open to all cities across Europe • PoliVisu ensures transferability of tools and processes through the up-skilling cities outside of the consortium with a free training initiative
Develop scalable and transferable methods and re-usable tools for mining, compilation, analysis and visualisation of data from any source, including data related to social dynamics and behaviour;	• PoliVisu tools and processes includes harnessing intelligence from structured data (from sensors) and unstructured data (from social media) to understand how different policy options may influence user behaviour (e.g. traffic routing) • PoliVisu utilises an existing tried and tested social media analysis tool for compiling and assessing trust of social media sources • PoliVisu is a series of interoperable, pluggable components that can be adopted by cities existing data platforms to increase likelihood of scalability and transferability - avoiding being another unused European platform
Understanding the implications of the increasing materiality of data with the development of the Internet of Things and its implications for the sustainability of government's effective use of big data for improved policy making in the longer term;	• PoliVisu visualisation tools and policy-making framework are co-created based not only on government needs around the Internet of Things (IoT) but also to include the wider Internet of Everything (IoE) trend • PoliVisu is developed as a series of interoperable, pluggable components that can be adopted by cities existing data platforms to increase likelihood of scalability and transferability - avoids being another unused European platform • PoliVisu provides training for cities to understand how data and sensors will change the future of policy modelling and city governance
Develop scalable and transferable methods and re-usable tools for policy modelling and simulation to improve the predictive analysis capacity of governments;	• PoliVisu visualisations provide prediction of impacts of different transport policy options (e.g. change in user behaviours) • PoliVisu closes the gap between long term policy decisions and short-to-medium term city operational decisions by providing shared views • PoliVisu enables policy actors to quickly communicate to stakeholders the impact of different policy options • PoliVisu framework can be utilised with other data tools if a city requires

1.3 Concept & Methodology

"Data is the lifeblood of democracy."

- Enrico Giovannini, University of Rome

1.3.1 Concept

1.3.1.1 Opportunity

PoliVisu's approach to data-driven policy experimentation will be tested in the field of smart mobility, chosen because transport forms the backbone of all urban economies. The ability to move freely, cost-effectively and easily is one of the most important drivers of economic and societal development. Its policies are interdisciplinary with a direct impact on urban development and the environment. For example, urban congestion, an exponentially growing problem in Europe contributes to over 40% of all CO2 emissions and up to 70% of other pollutants. The cost to society includes impact on health and damage to the environment. The cost to drivers of wasted time across all 45,662 major European traffic hotspots (identified in 2016) could amount to €207.9 billion by 2025. It's clear that European cities require effective strategies to help overcome these challenges.

But policy making can be a long and laborious process which struggles to keep up with the realities of everyday life. For instance, despite policies like the Kyoto Protocol which over 10 years ago, set out strategies to cut CO2, cities like Paris are suffering the highest levels of air pollution in over a decade! Today's policy makers have a need to act urgently, working with city managers to craft, trial and assess short term measures, including new transport initiatives, to more rapidly achieve their overarching policy goals.

Figure 1: Opportunity to close the gap between long and short term policy and operational decisions

Making agile policy decisions however, is easier said than done. Until recent years, transport was a comparatively staid field with policy making mainly focusing on the physical compliance activities of transport providers, for example road use, licensing, insurance, and safety. There was little evidence of collaborative working with other stakeholders, understanding user behaviour, and innovation levels were, generally spoken, low. Fast forward fifteen years, the evolution of the Internet means it's all change! Today the world is experiencing an explosion of new technology (Internet-of-everything, cognitive analytics, sensors) that is rapidly modifying the nature of transport; connecting information rather than just people and goods. New technology and the resulting location based **geographical information (GI)** it produces is changing the nature, costs and impact of transport on a real-time basis. It is this shift in speed, detail and synchronicity that presents a suite of new opportunities for public sector policy makers.

Whilst the private sector understands the power of the new prospects unleashed by the transport data tsunami, e.g. the release of 'big' flight data by the airline industry for open innovation to generate more effective sales, much of the public sector has yet to catch up. Decision makers are still rooted in traditional ways of doing things, making policy decisions based upon static models of consultation and closed planning meetings over a timeframe of a year or more. As a result, decision making is often siloed and slow, with thinking and solutions out-of-date by the time policy is ready to be implemented.

Yet it's clear to even the oldest most recalcitrant politician that the world has changed. Technology has changed us all, and so solving mobility problems in old ways no longer works. Whilst many administrations are utilising a number of innovative solutions to combat urban challenges (e.g. variable congestion charging) **no-one is yet harnessing the full disruptive power provided by big data and analysis** to prepare collaborative solutions that utilise the knowledge and experience of a range of urban stakeholders.

When it comes to modern transport policy, legislation and regulation will mean the difference between a potentially green utopia and a congested dystopia. Adopting new technology alone is not enough, systemic thinking is needed and the use of big data can help. Whilst the concept of driverless cars is undeniably cool, what happens if we have ever more cars clogging up our streets, polluting the air, driving around endlessly, free from the need to ever pay for parking? What type of policies will create more green, pedestrian spaces in cities? Should cities be taxing journeys not cars; establishing high levies for single passenger journeys rather than increasing fuel costs? **New methodologies and tools are needed to explore, experiment and test innovative approaches to addressing policy challenges.**

The future of mobility policy is ripe for a data revolution!

1.3.1.2 Solution

To take advantage of the increasing opportunities presented by city data for improving policy-making **PoliVisu** believes two major sub-challenges must be addressed:

- **Data Literacy:** The benefits (and risks) of data (especially GI) are not always widely appreciated by policy makers outside of specialist data teams, and as a result the use of data in the policy making remains low
- **Advanced Technology:** As policymakers move towards using data the need for advanced analytical techniques and easy to use tools to extract trusted intelligence from data becomes crucial

Although a variety of previous projects across the globe (e.g. Ordnance Survey MasterMap[3] and ESRI[4]) have furthered the state-of-the-art in using data for improving the policy process, they have generally tended to focus on research in niche aspects of the policy cycle or indeed in narrowly defined target areas such as crisis management rather than encompass wider societal challenges such as mobility. They also tend to focus on providing a specific solution to a direct challenge rather than enabling administrators to experiment and test a range of creative policy options that challenges conventional thinking to stimulate more creative solutions.

PoliVisu goes beyond the state-of-the-art to create new policy experimentation methodologies for use with visualisation tools that utilise open GI data **to stimulate innovative thinking around complex mobility challenges**. The use of interactive maps, heat maps and charts to understand user behaviour (e.g. shifts in traffic flows/volume due to changing events) **enables inter-disciplinary actors to explore new policy ideas together in a holistic, comprehensive, systematic, analytic, and visual manner before deploying costly pilot schemes.**

Using visualisation tools, analysis of problems can have greater depth as many layers of data relating to the physical and social world can be considered together. **With big data the tools can explore impacts across a whole city, rather than just one or two small localities**. Instead of providing spreadsheets of uninspiring figures to illustrate the impacts of, for example road routing decisions, visualisations provide **one version of the truth** for all to use. Visualising the data can make relationships more apparent, dependencies and interactions can be more clearly viewed and the trade-off between a variety of possible solutions can be modelled and evaluated.

PoliVisu overcomes the current challenges that hinder the use of data for policy making as follows:

- **Data Literacy:** **PoliVisu** ensures the opportunities presented by big data in policy making are open to all public administrations across Europe by
  - Developing and testing a collaborative framework for policy design and big data interplay that public administrations can use alongside their current process (evolution, not revolution)

[3] https://www.ordnancesurvey.co.uk/about/governance/gi-policy-making.html

[4] http://www.esri.com/industries/federal/policy-making

- Packaging tools and support material in a Playbox enabling public administrations to undertake policy experimentation
- Offering free training to cities across Europe to use the **PoliVisu Playbox** to learn how open and big data can be harnessed for policy making
- Creating positive user-stories from the results of the **PoliVisu** testing to showcase the business case for and incentive the use of data for policy making

- **Advanced Technology:** **PoliVisu** will make it easier to analyse data and derive accurate insights for policy development in a real-world context by
  - Providing decision-makers (policy and operational) with **visual, map-based, interactive data analytic tool**s that will facilitate data-driven decision making (DDDM)
  - Integrating crowd-sourcing applications that utilise existing social media channels to support collaboration and open policy making
  - Ensuring the **PoliVisu** tools are scalable, pluggable and interoperable so they can be used with any administrations existing (data) platforms
  - Testing the tools with the use of real big data sources including real-time data publication in RDF and its further combined use (e.g. road sensor data, parking availability, traffic cameras data, city bike rental availability, public transport schedules GTFS data etc.)

1.3.1.3 Offering

PoliVisu is designed to advance policy development in the age of big data, to deliver a trusted, scalable and transferable solution for accelerating the adoption of data-driven policy-making. More specifically it is designed to stimulate innovative solutions to societal challenges by making it easier for policy makers and their stakeholders to access, visualise and use a wide variety of big geo-data sources to explore and co-create policy in the key Horizon 2020 target area of transportation.

PoliVisu achieves the above by conceptualising the policy making process as a fast policy experimentation cycle consisting of three steps - Design, Implementation and Evaluation - thereby transforming traditional processes into a continuous policy adaptation cycle. The new approach reduces the gap between city policy making and operations by converting traditional high level strategic policies into more adaptive, better, context driven solutions thanks to the use of big data.

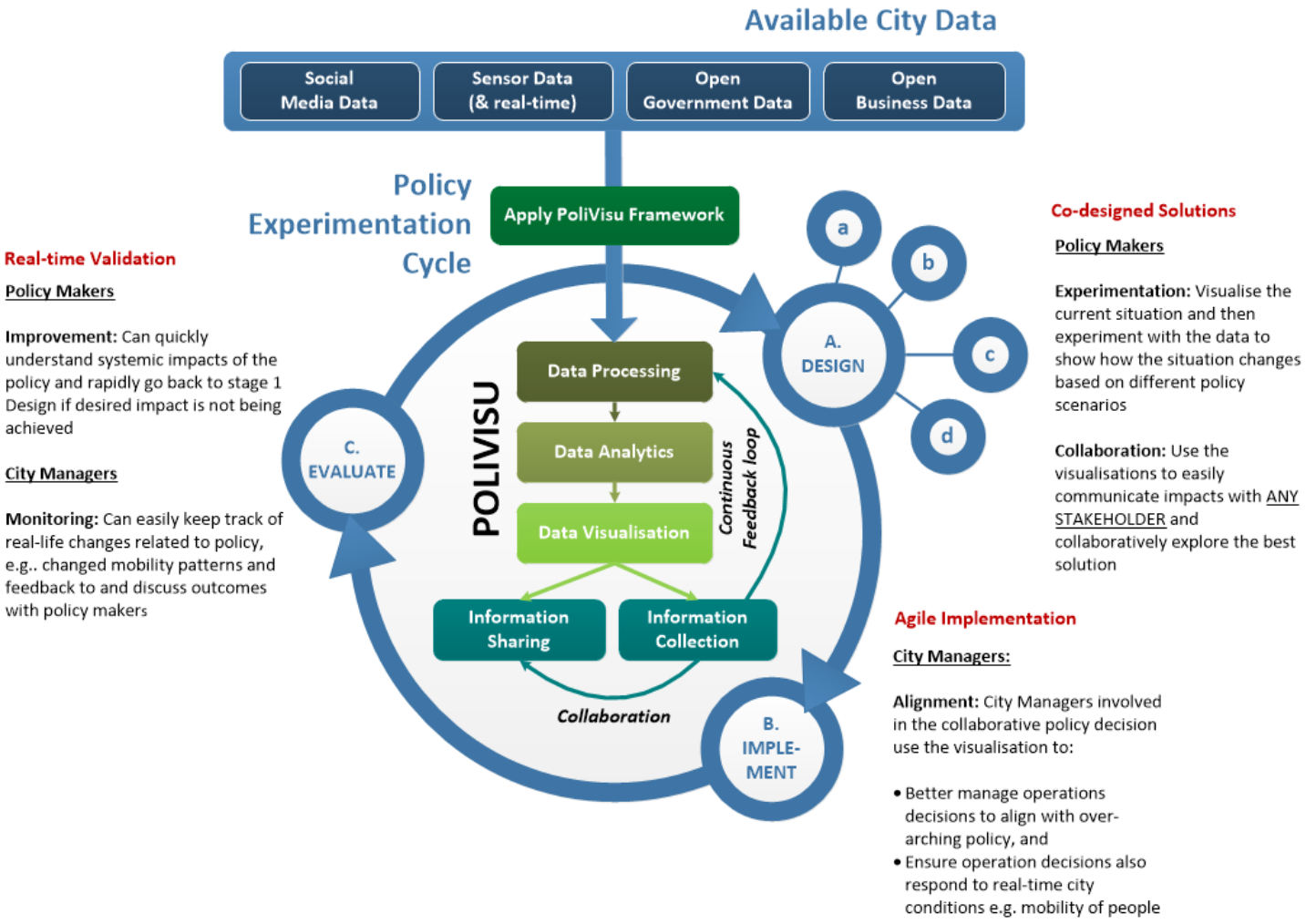


Figure 2: High Level Concept of the Policy Experimentation Cycle

An overview of the **PoliVisu** Experimentation Cycle (Framework) follows. This model will be updated and refined with further detail based upon research at the start of the project.

CYCLE A. Policy design process: The policy design process starts with the identification of a need for a policy solution. The identification of such a need is often based on the assessment by the public, involved actors and participants of the output of existing policies. The policy design process can be very complicated. It is often iterative, with different options and solutions being proposed and having to be reworked in response to feedback from decision makers, stakeholders and the public at large. The range of options is often constrained by interfaces with other policies or legal requirements. Different stakeholders will have different and possibly conflicting views on the proposed solutions - or even whether a new policy is needed at all - and will try and influence not only the policy but also the views of others to their advantage. Effective co-creation means sharing sufficient information in accessible ways to enable the public to make meaningful inputs and choices, and to do so in trusted ways that can counter biased interpretations from others trying to influence public response, hence the use of **PoliVisu**'s data visualisations to share one version of the truth.

This identification process begins with consulting different stakeholder groups. The policy need will be researched by or on behalf of the public institution and/or evidence for the policy need will be collected from stakeholders and the community. During this phase, it is key to congregate objective data about all the policy aspects involved (for example. Mobility impact, environmental impact, impact on society and financial implications). Based on the research and other evidence, a public institution often produces a discussion paper summarising the evidence and suggesting the main principles for future policy. The discussion paper may be part of further consultation with stakeholders and the public seeking to establish consensus on the need for policy creation or change and the main principles on which to develop detailed proposals. Based on consensus of the discussion paper (or, at least, clearly defined positions), concrete policy options can be developed. **PoliVisu** supplements and speeds up

this paper process through online visualisations of the different policy options impact to experiment with finding new solutions that work for the majority. One or more concrete policy options can then be subject to a further consultation with stakeholders and the public using traditional and social media methods. After the consultation step and feedback step, a policy decision will be formulated.

CYCLE B. Policy implementation process: A first transversal step is the communication of the decided policy as a result of the policy design process. **PoliVisu** explores the policy using relevant data to provide insights by using advanced visualisation techniques, including interactive map tools and graphs. The next step is to publish the policy. Using a combination of own media and external publication channels such as press are used to explain the policy. The **PoliVisu** visualisations will be an essential part of the publication besides the use of social media to interact with the public.

Next **PoliVisu** will help with reaction monitoring. During this step, new techniques will be used to monitor the opinions published in newspapers and on the internet. Part of the monitoring is also the ability to measure source reliability. With the information gathered, the Impact of the announcement can be assessed by measuring the number of reactions, the location, the mood etc. to verify public acceptance. The impact data will be collected and managed via a number of specific components that will be used, adapted or developed during the project by integrating advanced visualisation tools dealing with live and big data, social media tools to collect reactions and web publication interfaces to publish information.

The collected input will be managed and analysed – using the advanced **PoliVisu** tools or cities own management dashboards for policies. The outcomes can be used to support both operational decisions and policy decisions dependent on elements as impact, importance, time to implement. The results will also be used to influence policy communication itself, achieved via publication via the cities own communication channels (for ex. website) and or via external channels like newspapers and social media.

CYCLE C. Policy evaluation process: The policy evaluation process focuses on the monitoring & impact their analysis during the multidimensional impact assessment phase. The multidimensional approach is crucial to compare the impact on different policy aspects like environmental impact, mobility impact, financial impact, impact on citizens live, citizen compliance monitoring. As a result of the multidimensional impact assessment implementation actions and multidimensional long-term monitoring actions will be formulated. The implementation actions can be used in the implementation process and can lead there too new policy decisions. The multidimensional long-term monitoring can also influence the implementation process, but can also influence the way new policies will be designed in the future. To formulate the latter final policy conclusions and (long term effects) will be formulated.

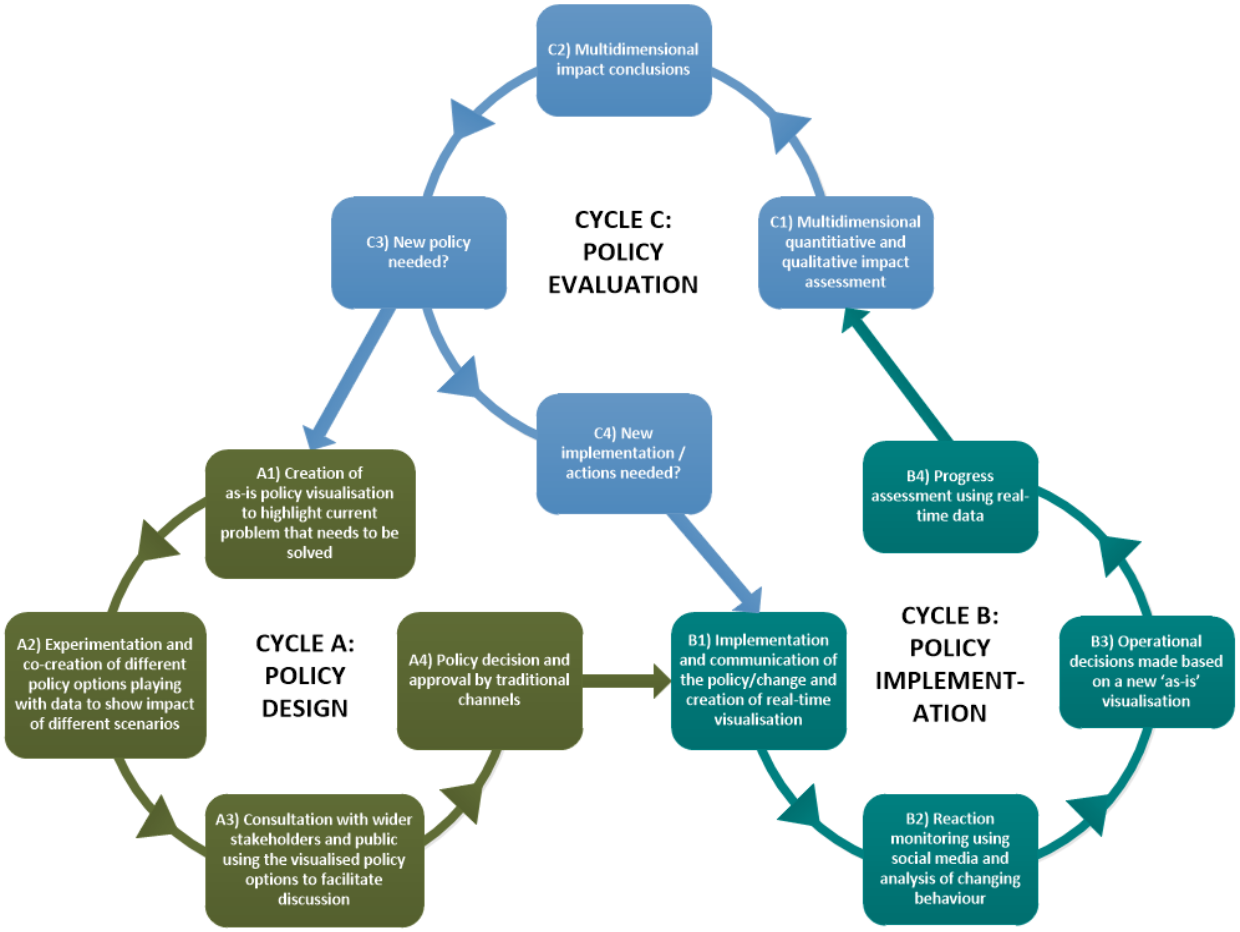


Figure 3: Key Elements of the Policy Experimentation Cycle

1.3.1.5 Project Positioning and Technical Readiness

To achieve the goals and objectives outlined in the previous sections, the **PoliVisu Playbox** for data-driven policy experimentation will consist of the key components in the table below. The technical components are all ready for evolvement/adaptation based on the research work of **PoliVisu** in collaboration with stakeholders:

Component	Description/Purpose	TRL
Non-Technical Support Components		
PoliVisu Framework	The **PoliVisu** framework will develop a policy experimentation cycle outlining the rationale for, and how and where and how big data can be utilised for smarter decision making. It will highlight the types of data that is potentially useful for decision making, where it is commonly found and how it can be harnessed and utilised. Considerations around privacy and legal concerns will be addressed to establish processes that deliver accurate/truthful policy scenario visualisations as well as mechanisms for ensuring fair collaborations.	n/a
Business Case for Data and Policy (Stories)	The use of data for policy purposes makes it possible to assess the potential policy impact of measures to elaborate long term trends and the impact of decisions made in the past. The use of big data is important to take fact-based decisions taking information from different sources into account (transport, environment, land-use planning, demographic). Being able to describe these benefits in policy-maker's own language (non-academic) is vital to the engagement and take-up of **PoliVisu**.	n/a

Available Data	Open data is a key component of the project. All the pilot cities have been involved in open data projects and initiatives and have an existing source of available open (some big) transport and geo data to use, as well as established relationships with private sector data suppliers. This available data provides a comprehensive foundation for use in policy experimentation.	n/a
Technical Components (integrated to form Visualisation tools)		
Geosparc Geospatial	A set of free and open source geospatial tools for publishing, visualisation and analysis of spatial data to create interactive digitals maps. The maps can be integrated within any software (CRM, ERP, Document Management Systems etc.) or within existing business processes. These maps form the base layer of the **PoliVisu** visualisations.	TR9
WebG Layer	WebGLayer is a JavaScript, WebGL based open source library for coordinated multiple views Visualisations. The library is focused on spatial data and large datasets (up to 1.5 million data records). It was developed and supported by EU CIP project OpenTransportNet for traffic flows and traffic accidents and will be expanded and enhanced within **PoliVisu** to facilitate a wider range of visualisations that meet cities' needs when working with smart mobility policy.	TR7
MicKa	MicKa is an open source system for metadata management used for building Spatial Data Infrastructure (SDI) and (INSPIRE-compatible) geoportal solutions. It contains tools for editing and management of metadata for spatial information, web services and other sources (documents, websites, etc.). It includes an online metadata search engine, portrayal of spatial information and download of spatial data. MicKa will be **PoliVisu**'s metadata editor.	TR9
TruthNest	TruthNest is a social media evaluation tool that helps clients to locate credible sources of information efficiently, verify the sources of that information and monitor the social ecosystem effectively by creating smart, semantically meaningful, context-aware, dynamic, cross-network streams. TruthNest today is used by several media companies. **PoliVisu** will enhance TruthNest with improved analytics of social media trustworthiness and automated processes to provide stakeholder input on matters influencing policy.	TR9
Warp 10	Cityzen Data is a big data solution company that provides an advanced big data software solution (Warp 10) based on "Geo Time Series" technology. Warp 10 addresses data coming from a large range of sensors, meters, IoT and more generally to any flow of data measured in time and space. Warp 10 is open source and scalable to support even the biggest of big data. The open solution allows implementation of advanced data analytics including machine learning/pattern detection.	TR9
Macq	The Macq smart mobility platform offers smart city and traffic management solutions based on live data streams coming from a range of mobility and traffic related sensors including detection and counting of vehicles, ANPR, classification, intersection traffic lights, urban centralized traffic coordination, variable message signs, intelligent cameras, centralized edifice management (tunnels, bridges, locks …), control and monitoring of highway lighting, weather stations, safety management in tunnels in cities and highways. This data will be used in **PoliVisu** data modelling.	TR9
Senslog	SensLog is an integrated solution for sensor networks. SensLog consists of a data model and server-side application which is capable to store, analyse and publish data in various ways. SensLog receives measured data from nodes or gateways, stores data properly in the database, pre-processes for easier queries if desired and then publishes data through the system of web services. SensLog is suitable for sensor networks with static sensors (e.g. meteorological stations) as well as for mobile sensors (e.g. tracking of vehicles, human-as-sensor). **PoliVisu** will use the Senslog source code freely available on GitHub to manage its sensor data.	TR6
Open Transport Map	OpenTransportMap is an open source traffic volumes modelling tool providing interactive web visualisation of traffic volumes. OTM provides detailed traffic model at the city/region level with hourly traffic intensities. In **PoliVisu**, the aim is to automate the traffic modelling engine for the cities so that actual/forecasted traffic impact can be calculated real-time for any roadworks.	TR8

PoliVisu has chosen to develop and enhance a suite of existing pluggable and portable open source components that can be adapted to create advanced visualisations for policy making. The use of modular technologies is a strategy to ensure that the **PoliVisu** solution can be easily adopted for integration within cities' existing policy platforms (for instance a city's existing website or citizen participation platform) as previous project experience has shown that cities already have too many stand-alone platforms for a variety of operations and now prefer pluggable, interoperable and configurable solutions. The modular approach also ensures scalability as new modules for Artificial Intelligence and more complex algorithms can be added as technology improves, thereby **PoliVisu** can keep one step ahead of the market. Technical and functional specifications for integration will be developed in collaboration with cities at the start of the project. However, the diagram below depicts which logical layers and technical components will be used during the process flow for accessing, analysing and visualising data.

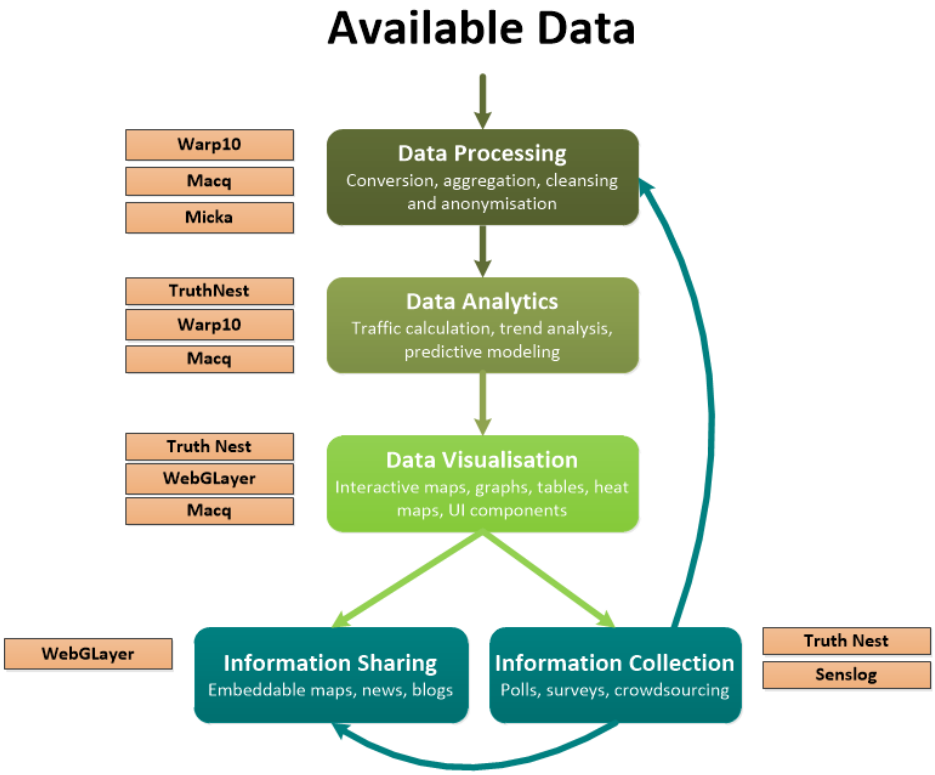


Figure 4: Technical Component Mapping Against Processes to Achieve Policy Impact Visualistaions

The layers (and their components) will work together to realise the complete process from Data Processing, over Data Analytics, Data Visualisation till Information Sharing and Information Collection.

Data Processing: **PoliVisu** will access very diverse data sources including big datasets, sensor data, social media, open data, metadata, spatial data, etc. The aim is to set up an infrastructure of "smart data", which means that any data coming from sensors or other sources are stored as row data, can be used in any application, can be analyzed and correlated with other sources of data and can be used to provide detection of patterns to understand the effective functioning of any infrastructure, system, services or process within the city. This smart data architecture will leverage Geo Time series™ in which all sensor data or any probe measuring an event will be defined in time and space (location). This allows to manage data in a very efficient way and agnostic on the types of applications using the data.

Another important responsibility are the processes and techniques to make the data usable for policy making in terms of privacy through anonymization, aggregation, blurring, etc. Big data (e.g. data coming from automatic number plate recognition or ANPR) provides a high level of detail on mobility and traffic flows. The level of detail captured and stored therefore raises questions about privacy. Police departments are allowed to store this kind of detailed information for a limited time period. If that information needs to be stored for a longer period (for instance to perform historical analysis), certain anonymization is required so that no private personal details can be extracted from it. Especially when such detailed information is made open data. Technical components Warp

10, the Macq system, Micka (metadata), SensLog and the Geospatial components provide capabilities to support data processing.

Data Analytics: The resulting smart data infrastructure provides a horizontal and reproducible approach for analytics and functional applications like (a) analysis of road safety, the use of traffic infrastructure and car parks, (b) understanding the impact of weather, seasons, date and time on traffic and mobility, (c) predict the evolution of infrastructure usage (incl. Traffic models), (d) predict faults or problems on city systems, transport infrastructure, congestions. The data analytics layer performs traffic calculations, discovery of correlations within or between data sources, detection of trends, social media or sentiment analysis, impact assessment, spatial analysis and modelling. Data analytics are provided by Warp 10/Cityzen Data, the Macq system, TruthNest, the OpenTransport Map Traffic Modelling and the Geospatial components (spatial analysis).

Data Visualisation: The data Visualisation layer foresees the necessary tools, GUI components, libraries and widgets to present the results of the data analytics in a set of powerful yet easy-to-use and intuitive visualisations. A strong focus is on presenting the spatial-temporal aspect of the data in an "interactive" and "connected" way. Interactivity means that the user can interact through the GUI and the system will respond (near) real-time. Connectivity is realised by integrated, linked and synchronised graphs, (heat)maps and tables.
This layer also delivers functionality to integrate multiple dimensions of data into a single-screen visualisation, to present a correlation between metrics or to highlight trends. Another important aspect of data presentation is the use of inline and smart user guidance and tooltips taking into account that an increasing amount of data Visualisations will be handled on touch and mobile devices. WebGLayer, TruthNest, the Macq web frontend and the Geospatial components deliver data visualisation functionality.

1.3.1.6 Technical Component Overview

Macq solutions: Macq is a company specialized in traffic and mobility management solutions with a diverse product range including: (A) iCar-CAM is an integrated camera system that captures vehicle registration plates both night and day. It is comprised of a digital image capture unit, an infrared light, a processing unit and different algorithms. (B) iCAR-MANAGER is a software tool used to configure and operate iCAR systems. (C) TIM or Traffic Incident Management, gives traffic and technical operators the ability to quickly and effortlessly handle events occurring on their network and provides them with integrated and efficient interfaces to control their equipment and automate their tasks. (D) M3 Macq Mobility Management System is a Smart Mobility Platform. It incorporate traditional traffic management but supported with big data and extended with non-traditional sources of mobility information like social media.The Macq products can be integrated with other applications via a series of open data interfaces and web services. Within **PoliVisu**, Macq technology will be used to provide detailed big traffic data as well as processing and analytics of that data to generate valuable traffic and mobility information that can be used in policy making processes.

Warp 10: is Cityzen Data's platform for sensor and big data management. Warp 10 is available in open source (Apache 2.0). It stores, manipulates, analyses data which are coming out of sensors, meters, mobiles or any probes, often in large quantities, at high velocity and big variety. To model and build-up relevant results and feed monitoring and control command systems, this big data must be processed in real time or near real-time. To cope with this, Warp 10 provides functions like Storage and manipulation of data defined by time and location (e.g. purchases, damages, traffic incidents, citizen mobility data); Cleansing of data to detect, correct or remove corrupted or inaccurate data; Filtering and data reduction depending on the (granularity) needs; Identification of correlations and discords between data streams; Modelling patterns by taking a deep history of data into account; Predictive analysis; Machine learning; Geofencing data to provide relevant output for a specific area; Customization of data and analytics results and open data publishing. Warp 10 is based on six components: **Continuum** (Storage), **WarpScript** (Functions), **Quantum** (Visualisation), **Synapse** (API), **Plasma** (Real Time), and **Hadoop Integration** (Integration with Pig, Spark, Flink and Storm).

Warp 10 provides many capabilities for calculation, data analyses and data mining on sensor and big data. A key challenge is to provide end users, including policy makers the Visualisation capabilities and crossing with other GIS information to support real world applications and smart cities. Cityzen Data's objective in **PoliVisu** is to

investigate how big amounts of data handled and served by Warp 10 APIs can be Visualised and combined with (GIS) information in support of policy making processes.

MicKa: is a catalogue application for management and discovery of geospatial metadata. It supports many standards including OGC Catalogue Service (CSW 2.0.2), Feature Catalogue (ISO 19110) and ISO AP 1.0 profile. MicKa is INSPIRE compliant and provides functionality for transactions, metadata validation and harvesting, a metadata editor and the INSPIRE ATOM download service. MicKa also supports linked data and popular CSW output formats including HTML, JSON, KML, GeoDCAT, RDF. MicKa is published as open source (BSD license) and will be used in **PoliVisu** to fulfil any metadata requirements arising in the project.

SensLog: is an open source (BSD license) system for managing sensor data. It supports both static and mobile sensors. Communication happens via web services in JSON format or via core methods of the OGC standard SOS version 1.0.0. Key features are: (A) Receives measured data either directly from sensor device or indirectly from any front-end elements; (B) Stores sensor data in SensLog data model implemented in RDBMS; (C) Pre-processes data for easier querying if necessary, and/or analyses sensor data; (D) Publishes data through web services to front-end elements or applications.

TruthNest: is a service ATC has implemented for assessing the trustworthiness of information found in Social Media. TruthNest users can directly analyse a single post and gain insights per several dimensions of a verification process. They can also capture streams from social networks, from which they are then able to analyze a single post as depicted in the workflow below:

Figure 5: TruthNest Verification Through Media Streams

TruthNest then verifies information applying the 'triple-C method', which allows the user to assess the trustworthiness of a post by calculating 15 different metrics under the following three pillars:

- **Contributor** – This involves all data relevant to the source of information, such as its history, its reputation, its connections and interactions along with other information that can assist in the profiling of any contributor of content.
- **Content** – This includes analysis methods that can provide clues about the credibility of linked content (as photos and linked web content) and indicate possible manipulations and fraudulent use.
- **Context** – Under this pillar all contextual relations which strengthen or weaken the confidence built around involved concepts are investigated.

TruthNest will be used as one more information service in a greater monitoring dashboard providing transport related information. TruthNest will be providing transport related information found in Social Media together with all the analysis information explained in the previous section. In addition, we will develop a monitoring mechanism for Twitter content that will automatically gather transport related information that is trending in Real Time and alert the users on possible events as accidents that have happened in areas that are being monitored through the dashboard. Pre-determined keywords and hashtags related to transport will be used for following trending discussions but the users will also be able to add their own terms which will be taken into consideration instantly. TruthNest already supports web-service APIs to communicate with other applications but during the project these will be extended to support the integration process with all 3 pilot cities applications and the demonstration platform.

WebGLayer: is a JavaScript library focused on fast interactive Visualisation of big multidimensional spatial data through linked views. It is an open source software released under the BSD license. The library is based on WebGL and uses the device's GPU for fast rendering and filtering of data. It can render the data on the map provided by third party libraries (e.g. OpenLayers, Leaflet, GoogleMap API). The library can Visualise hundreds of thousands of features with several attributes through a heatmap and a point symbol map. A heatmap is a Visualisation used to depict the intensity of data at a certain location. WebGLayer uses a colour scheme based on a red-green colour gradient to Visualise the density. A low density (transparent green colour) represents a location with a lower amount of records; a high density (red colour) indicates a 'hotspot', or a high concentration of records. WebGLayer allows to develop interactive heatmap Visualisations of large datasets by implementing multiple linked views to present data. Each of the views enables different interactions (such as filtering or relationship analysis) that trigger an instant update of the other views. Users thus benefit from immediate and dynamic data Visualisations, gain better understanding of data by applying filters, and develop the opportunity to discover relationships and patterns in the data.

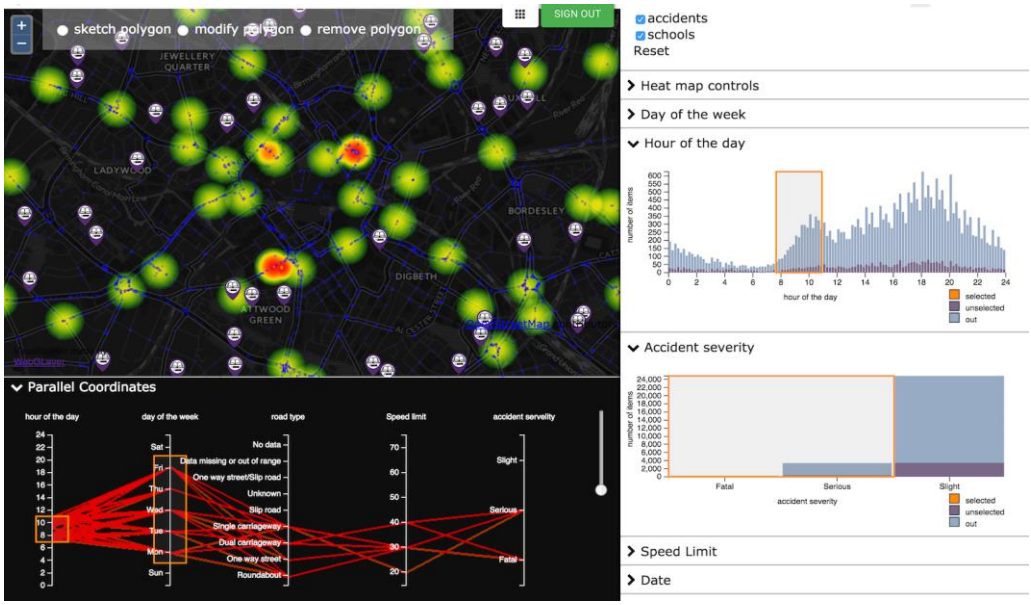


Figure 6: Heatmap Visualisation of Traffic Accident Hotspots Near Schools in Birmingham UK

(filter: fatal and serious accidents that happened between 8 to 11am on weekdays) Developed in EU Project OpenTransportNet)

Geospatial Components: These components are a set of free and open source geospatial tools and libraries that are widely used and actively supported. These are the usual suspects for managing data access and processing, spatial analysis, map composition, publishing and map visualisation. The geospatial components that will be used are GeoTools, Geoserver, Geomajas, OpenLayers and Leaflet. They are all standards compliant (INSPIRE, OGC), are extensible and technically combine well with the APIs and service interfaces of the other consortium components. Within **PoliVisu** we will use and integrate several of these components to foresee the necessary spatial capabilities for creating, publishing and visualising maps. We appropriate additional standards; service interfaces and data model requirements will be defined and the necessary extensions will be added.

OpenTransportMap: (OTM) is an open source traffic volumes modelling tool that provides interactive visualisation of the traffic volumes. OTM has calculated a pan-European traffic road model based on the origin-destination matrix containing 120.000 traffic generators. OTM also provides detailed traffic model at the city/region level with hourly traffic intensities. The first city prototypes were developed during the OpenTransportNet project in 2016 (link to the app). The current solution provides a traffic modelling engine which requires offline processing in a desktop traffic engineering software and with human intervention. In **PoliVisu**, the aim is to automate the traffic modelling engine for the cities so that the actual/forecasted impact can be calculated real-time after a roadwork or any other traffic issue is submitted via a city manager dashboard. The traffic modelling engine will further be refined by leveraging big historical road sensor data that will be used to calibrate the traffic modelling to provide more precise traffic forecast. The use of real-time sensor data will be considered as well.

1.3.1.7 Assumptions

PoliVisu will operate under the following assumptions:

- **PoliVisu** operates per the principles of Open Government - transparency and accountability
- **PoliVisu** uses open source components wherever possible
- **PoliVisu** focuses on the experimental dimensions of policies
- **PoliVisu**'s approach will be tested with data already available in the pilot cities and the consortium
- **PoliVisu** is open to participation/adoption from stakeholders across Europe and beyond
- **PoliVisu** will contribute results to broader network discussions around open policy making standards
- **PoliVisu** partners are fully committed to delivering deliverables and achieving the goals of the project and will all sign a consortium agreement

1.3.1.8 Inter-disciplinary Considerations

The potential for inter-disciplinary working with **PoliVisu** tools are unprecedented. Transport impacts many different domains, so data between domains can be combined usefully (if it has a geolocation component) for intelligence extraction. For example, **PoliVisu** could map pollution data, such as CO2 measurements, against road use, and with public health data, such as location of cancer-related deaths, and census data. Such integrations could help facilitate research to uncover what sort of pollution is causing what sort of health effects in what sort of population, where and when.

1.3.1.9 Use of Stakeholder Knowledge

PoliVisu is specifically designed to utilise stakeholder knowledge by creating a more collaborative policy making process. By harnessing visualisation technologies, **PoliVisu** begins to close data gaps that have long impeded effective policymaking. As problems are illuminated, policy-making can become more targeted, with attention appropriately and efficiently directed; more tailored, so that responses fit divergent needs; more nimble, able to adjust quickly to changing circumstances; and more experimental, with real-time testing of how problems respond to different strategies. Building such a data-driven government will require sustained leadership and investment, but it is now within our reach.

1.3.1.10 National Research and Innovation Activities

The need for **PoliVisu**'s approach came from direct discussion with cities and an analysis of existing research and literature. It is widely accepted that the use of ICT for decision making can help resolve collective problems in a participatory and cost-effective manner. In the work of Berkhout and Hertin (2004) individuals used websites to calculate personal carbon emissions Later, Kaschesky et al. (2011) later reflected on the requirements for opinion mining in social media and the blogosphere, and Rodríguez et al. (2007) established their own social software system for collective decision-making – the Smartocracy model (see also Evangelopoulos & Visinescu, 2012).

With regards to data, over the last seven years much of the research that scrutinizes methodologies for online data-based policy-making is based on the future-oriented technology analysis work by Haegeman et al. (2010) who reviewed methods for policy and decision-making that best suited the data-based co-creation paradigm of governance. Among them, creativity approaches such as Theory of Inventive Problem Solving (TRIZ); matrices-based approaches such as morphological analyses or cross-impact analyses; and logical/causal analysis such as stakeholder analyses and social impact assessment were suggested. Moving findings forward a few years later Gluesing et al. (2014) advanced these approaches by focusing on how to deploy data through network analysis as visualisation tool, and Fernández et al. (2011) systematize a Visualisation plan for semantic data so as to bypass traditional limitations of data access. The Importance of Visualisation to enrich the use of Open Data is also advocated by Graves & Hendler (2013), whose own works includes survey data supporting this hypothesis.

More recently several contributions evolved from a holistic analysis of the three branched nature of IT-enabled policy analysis. From that angle, Puron-Cid et al. (2012) scrutinized the policy-cycle from an integrative view in which data, app interfaces and governance structures are captured in a single framework. To put it in their words: "We found that no matter how policy analysis is approached (top-down or bottom-up) and the sophistication levels of the technologies used, well-trained human resources are also part of the equation" (2012: 104). **PoliVisu** will

seek to build upon the outcomes of this work, whilst simultaneously advancing the use of geo-data standards, by partnering with and sharing knowledge, data and results with the following International research and innovation activities (others will be added during the project):

Initiative	Objectives/ Principles	Relevance for PoliVisu
Policy Improvement		
Policy Lab	Brings together a community to explore the use of new digital tools such as the advanced analytics of large unstructured data, and adopting rapid prototyping and iterative development in policy.	Aligns with **PoliVisu**'s practical experimentation approach to policy. **PoliVisu** will feed results into the Lab to ensure findings are widely disseminated and will stimulate debate with other lab members to improve the **PoliVisu** offerings
Open4Citizens	Shows the potential of open data to citizens, by creating open playgrounds where citizens, students, experts, start-up companies, academia and public institutions can collaborate to generate meaningful applications.	Shares principles of open experimentation with data. **PoliVisu** will work with Open4Citizens team to share lessons learned and understand where each other's research and innovation focus can complement the others findings
SCOOP4C	Investigates, discusses and disseminates how the once only principle can be implemented in public service provisioning to significantly reduce administrative burden.	Opportunity to exchange lessons between the projects on how to simplify administrative procedures for citizens (for **PoliVisu** this means consultations) while reusing data among administration with the control/ consent of citizens.
WeLive	The WeLive Framework is an ICT infrastructure which adapts, enhances, extends and integrates Open Innovation, Open Data and Open Services components selected from consortium partners' previous projects.	Potential for **PoliVisu** to add an Open Policy Making component to the WeLive Framework and to work in partnership to advance Open Government standards overall.
SMARTICIPATE	SMARTICIPATE is a data-rich citizen dialogue system, transforming public data into new intelligence, and transposing elements of intelligent ICT development to urban governance.	SMARTICIPATE aims is to integrate bottom-up processes in the realm of city planning. Whereas **PoliVisu** wishes to bring top-down policy-processes in the realm of city operations, leading to lots of opportunity for collaboration.
Geographic (Big) Data Use		
INSPIRE	INSPIRE works to create a European Union spatial data infrastructure to share environmental spatial information among public sector organizations and better facilitate public access across Europe	**PoliVisu** will use INSPIRE standards with its geospatial visualisations helping spread use and knowledge of these standards across Europe to help promote interoperability between countries spatial data infrastructures.
GISCO	Produce maps, spatial analysis. Promote geo-referencing of statistics. Provide user support for Commission users of GIS	**PoliVisu** will support the work of the Commissions group by promoting GIS and data dissemination in the EU.
Copernicus	Ensure comprehensive and sustainable supply of data from space-based Earth observation.	**PoliVisu** potentially utilised Copernicus data providing new examples of it uses.
Open Geospatial Consortium	Standards body developing publicly available interface standards for geospatial data use across the globe.	**PoliVisu** will advance the research of an existing working group working towards harmonization of spatial information across the EU.
Geographic information/Geomatics	ISO/TC 211. Standardization in the field of digital geographic information.	Providing a framework for the development of sector-specific applications using geographic data.

PoliVisu will also support the goals and priorities of national governments in each of the countries where pilot sites are to be deployed. The following table summarises the impact of **PoliVisu** on national policies, programmes and initiatives that help encourage the adoption of data practices:

Initiative	Objective/Aim or Principle	Relevant Outputs for PoliVisu
France		
French GeoPortal	Allows stakeholders to create their own maps, to discover, understand and analyze territory. Data relates to environment, development, public service	Online access to the public for many data sets. The view service API allows other web sites and portals to embed geo-portal Visualisation windows
The French Association for Geographic Information	Forum that contributes to the development of the geographic information sector.	Promote the development and use of GI among both public and private sector organizations
data.gouv.fr	Facilitate the free reuse of Public data recorded on data.gouv.fr	Harmonize standards and data formats. Provide opportunities to develop innovative services.
OpenDataFrance	Bring together all stakeholders involved in a project of Public Data Sharing France.	Common resources space for all OD projects in France
Belgium		
Data.gov.be	Increase the potential for the Flemish government to innovate in terms of policy and service delivery.	Develop Innovative apps in a wide range of different policy sectors
Flemish Geographical Information Agency	Create large databases with detailed regional maps for government agencies including local communities, utility companies and citizens (open data) in Flanders.	Provide mapping and other geographical information products and services to municipalities in Flanders
The Belgian Road Association	Encourage reflection on a vision of the future based on sustainable development.	Unites various actors in both the public and private sector - involved in the construction, management and operation of road infrastructure in Belgium.
Czech Republic		
Opendata.cz	Builds an open data infrastructure which will enable to access public data in Czech Republic.	Share data freely. Combine data freely
Czech INSPIRE Geoportal	Czech Gateway for INSPIRE	Discovery of data. Share data

1.3.2 Methodology

1.3.2.1 General Approach

The **PoliVisu** approach is broken down into three continuous, interactive workstreams: A) Research, B) Innovation and C) Validation. The processes within and the outputs of each stream will be **governed by a panel of eminent experts in the field of data research and policy making/modelling**. These experts not only provide academic rigour and scrutiny to the approach of **PoliVisu**, they also act as a sounding board and a dissemination channel who can help steer the project to success.

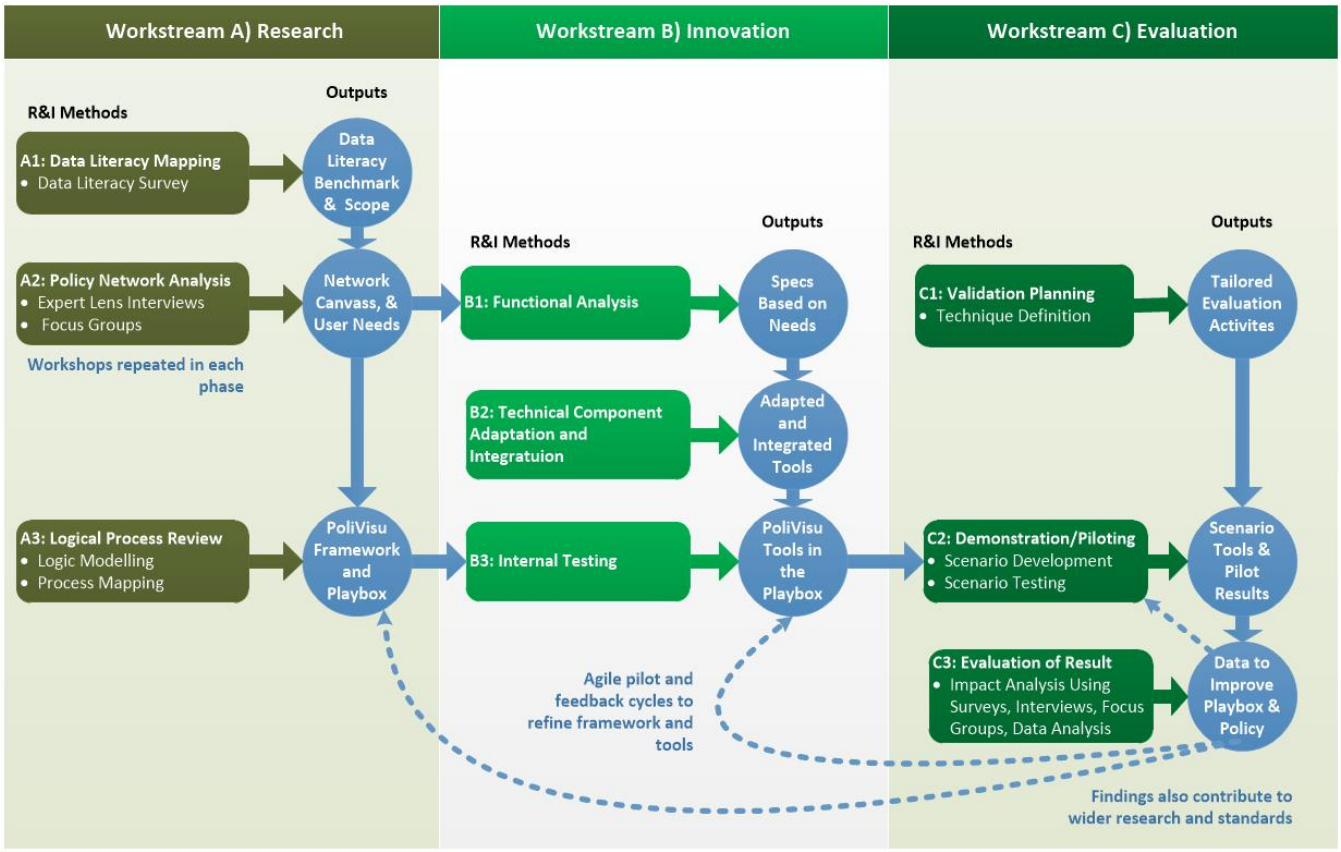


Figure 7: High Level Overview of the **PoliVisu** Methodology

The key techniques to be used are as follows:

A) Research Stream

The research stream contains all the activities related to designing and developing the **PoliVisu** Framework which outlines when and how big data will be used in the policy process. The key steps are:

A1. Data Literacy Mapping

Data Literacy Mapping will provide a comparative assessment of the extent of big data usage and literacy among public sector actors in Europe. By taking stock of current practices, devoted resources, data related skills and tools, as well as governance mechanisms, it will allow **PoliVisu** pilots to situate themselves within a pool of actors that use big data to improve internal efficiency and/or service delivery to citizens. The mapping exercise will be carried out using an online survey, with a sample size of around 100, covering all member states. Its results will lay the groundwork for future co-creation and experimentation activities in the three pilot cities.

Data Literacy Survey: Data Literacy Survey is the main instrument with which information on big data usage and literacy will be collected. The survey will be designed in the early months of the project and sent to key stakeholders in transport and/or urban planning in at least three administrative units in every member state. NUTS 2/3 units will be selected based on their level of economic development – highest, average and lowest – as measured by GPD per capita. Such distinction is necessary to ensure greater variability within – and hence the representativeness of – a survey sample, and it will also allow to check whether literacy rates correlate with economic development. In terms of contents, the survey will contain a number of questions covering different aspects of data driven policy making in an organisation, from the number of people involved and their skillsets to the types of data and tools used to real-life examples of projects where big data helped to deliver tangible results either internally or externally. Survey results will then be used to identify best practices and any commonalities/differences between administrative units with similar/different economic characteristics will be duly documented and studied. For pilots, the results will also serve as both the point of comparison and the first step to co-creating enhanced policy processes that encompass use of big data visualisations to improve existing activities.

Outputs – survey results presented in the form of a report and a comparative table grouping countries according to their big data literacy rate: high, medium, low.

A2. Policy Network Analysis

The Policy Network Analysis explores the links between individuals, governments, policy communities and other non-government actors in the policy making lifecycle and the information flow between them. It enables researchers to illustrate the functioning of complex systems and identify problems with the flow or existence of a network. Network analysis will help identify obstacles in current methods of policy making, and will also help identify the most important actors influencing governmental decision-making in the area of big data. Using different research techniques (e.g. desk, interviews, focus groups), project partners will be able to "paint" a Policy Network Canvas for each pilot city, showing on it the main stakeholders, relationships between them and points where bottlenecks tend to occur most frequently. The techniques **PoliVisu** will use to paint the canvas and assess **PoliVisu**'s impact on stakeholder interaction and assess the bottlenecks within it include Expert Lens Interviews and Focus Groups.

Expert Lens Interviews: Expert Lens Interviews will be performed in every major phase of the project (policy design, implementation and evaluation). Input from the first round of interviews will be used to draw up a complete Policy Network Canvas for every pilot city, while subsequent rounds will serve as a means to update the canvas with any new information and to assess **PoliVisu**'s role in reducing existing bottlenecks in the relevant policy networks that may be impeding important policy reforms. Owing to the multi-actor nature of the phenomenon to be investigated, interviews will focus not only on policy makers and city managers, but also on non-governmental actors such as private companies and research bodies working with big data.

The strength of this qualitative tool is its ability to illuminate meaning, capture concerns and allow people to give explicit explanations for their actions and decisions as well as validating emerging insights of a study. Interview techniques are particularly valuable as a data collection method when the objective of the research project is to understand informants' (possibly differing) views of a programme or common setting; to document their experiences in implementing a programme; or to describe different outcomes across people or sites. They can yield information that can not otherwise be gained through randomised data collection methods.

Deploying skilled interviewers is key to the success of a research strategy that incorporates interviews as qualitative data collection techniques. **PoliVisu** consortium includes qualified partners like Polimi and 21c Consultancy that have extensive experience conducting online and offline, structured and unstructured interviews with participants from different socioeconomic and ethnic backgrounds. To select research participant's a thorough desk research will be performed by the project team. Its aim will be to identify and invite the most relevant actors in both civil service and non-government camps that have the best understanding of and greatest influence on big data driven policymaking. After selecting candidates for the interviews, the interviewees would then be approached by email and telephone. Interviews would be conducted by telephone, where possible, to minimise travel costs. However, it may be possible to conduct interviews in person if the timing coincides with a relevant conference or other event which will bring together a number of relevant stakeholders in one location. The working language of most interviews is preferably English for reasons of efficiency, but multinational study teams can draw upon a range of language skills if necessary. Subjects give interviews under defined privacy and data protections condition (such as the Chatham House rule, for instance) and are guaranteed the right to review and audit transcription of their contributions.

Researchers conducting Expert Lens Interviews will follow a step-by-step protocol to guide them through the process. The protocol will adhere to the common norms and rules of qualitative research such as informed consent, participant rights and confidentiality. It will also include a strict set of interview questions – depending on the nature of the interview this requirement may be loosened – and any planned prompts that may be relevant, among other things. All interview recordings will be transcribed and coded using NVivo software for further analysis.

Collaboration Focus Groups: Focus groups or group discussions usually consist of a group of 6-10 people brought together to discuss a particular topic or set of topics guided by a moderator who facilitates discussion among participants. The group is moderated or facilitated by a researcher. Focus groups are a well-established and rigorous method of social research and evaluation where data is shaped and refined through the group

interaction, which is explicitly part of the method. In each pilot city, focus groups will be organised during every major phase 'policy design, implementation and evaluation'. The composition of the focus groups and the main topics will be adapted to the focus in each phase. A minimum number of 15 focus groups will be organised. One in every pilot during the policy design phase, three during the policy implementation phase and one during the evaluation phase. Information gathered by means of a focus group will complement that collected during interviews and will be used first to "paint" a Policy Network Canvas and then to update its content and assess **PoliVisu**'s role in reducing existing bottlenecks in big data policy network environment. Steps that will be used in Expert Lens Interviews as regards participant identification, research ethics, data transcription and coding will also be used to organise, run and manage focus groups.

Outputs – Policy Network Canvas depicting (a) key stakeholders that affect (big) data driven policymaking, (b) relationships between them and (c) points where bottlenecks tend to occur. User requirement documents.

A3. Logical Process Review

The Logical Process Review will take the outcomes from the Policy Network Analysis steps to create solutions for the identified barriers which will help facilitate data-driven decision making.

Logic Modelling: Logic modelling forms a core aspect of our evaluation of the existing policy frameworks. Logic models provide graphic representations of the essential elements of a programme or process, in terms of inputs, activities, outputs and outcomes. They encourage systematic thinking about a project, external influences impacting on it and its underlying assumptions, and make them explicit. Logic modelling is useful in emphasizing causality and gaps between components of a programme. Similarly, to the Theory of Change (ToC), a logic model provides a strategic picture of the resources and interventions required to produce outcomes (short- medium- or long-term) needed to reach an ultimate goal. A logic model-cum-ToC will be used by each pilot to address a specific policy challenge (ultimate goal) using different data, tools, financial and human resources as well as networks of partners sharing the same cause. A standard logic model for a pilot city will look as follows

Inputs	Activities	Outputs	Outcomes: Short- medium- long-term changes
• Financial • Management (e.g. municipality, public authority) • Experts (e.g. GIS, ICT) • Data (e.g. crowdsourced, open) • Collaborative action (e.g. MoU)	• Expert Lens Interviews • Focus Groups • Co-creation / design workshops • Functional analysis • Systems integration • Testing • Validation	• Static maps • Interactive visualisations • Apps (mobile) • Apps (web-based) • Predictive analytics (e.g. algorithm)	• Efficient coordination of road works in the city • Better use of advanced technologies in transport management • Better integration of transport and land use planning • Better public transport services and facilities

Process Mapping: Process mapping is a workflow diagram that is used to bring forth a clearer understanding of a process or series of parallel processes. The drafting of the process map relies on an iterative process of drafting and revising, using a combination of methods to gather the relevant evidence. Document reviews can be used to reach a preliminary understanding of the science and technology assessment process, supplemented by key informant interviews to get access to further documentation and to validate the initial findings. Process maps can often lend themselves to being used to identify the capacity (that is, the availability of relevant skills and resources) needed to deliver the intended outcomes and to manage the risks incurred. The process map can also be used to generate a series of hypotheses to be tested.

Outputs - **PoliVisu** Framework based on user needs. The framework is expected to include guidance on how to utilise existing city data into the traditional decision making process. while avoiding external and internal bottlenecks. Another output includes a logic flow diagram for every pilot outlining detailed, realistic and measurable inputs, activities, outputs and outcomes.

B) Innovation Stream

The innovation stream includes all the adaption and integration work to create the analytics and visualisation tools that policymakers can use to influence policy decisions in the short and medium term. Key activities and models include:

B1. Functional Analysis: Based on the requirements derived from the policy network analysis (A) a functional analysis will be performed to describe what information will be used, which data (analysis) is required to generate that information and how will it be visualised. The analysis consists of two parts. One part is describing the analytics and visualisation available for the public and the second part describes how the collected data and visualisation will be integrated in existing processes and ICT systems with the pilots. The functional analysis also describe how the data will be published as open data for reuse by third parties.

B2. Technical Component Adaptation and Integration: Starting from the functional requirements specification (B1), the overall architecture and technical requirements will be distilled and the gaps with the existing tools and solutions will be documented. Next, the technical partners will devise concrete plans to create, extend, adapt and enhance the necessary components required to meet the business challenges formulated by the pilot cities. The actual implementation of required adaptations will follow an agile approach where incremental software capabilities are delivered in consecutive iterations. At the end of each iteration the results of previous deliverables will be validated in close cooperation with the pilot cities (system users). Feedback and new insights will be considered to ensure a maximum alignment between the policy experimentation approach, the pilot requirements and experience and the technical implementation plans. The component integration will focus on how we will integrate the functional components to support the policy process. With integration **PoliVisu** will focus on a smooth data exchange between components and not on a full integration in one product. This is important because **PoliVisu** expects that the integration process will be different because of the different nature of the pilots.

B3. Testing: Initial testing will contain a combination of dynamic testing, during the development process of individual components and static testing by reviewing the result based on the requirements and functionalities. The dynamic testing will be done by the pilot partners and the partner responsible for the functional analysis. Once the tools reach a beta level that the pilot cities are happy with they will be released into the Validation workstream for agile user testing via a living lab methodology organized by the pilots in cooperation with 21C and the technical coördinator Geosparc.

Outputs - **PoliVisu** Data Analytics and Visualisation Tools ready for testing and validation in a Living Lab setting.

C) Validation Stream

The validation stream contains a set of techniques relevant to demonstrating and refining the **PoliVisu** framework and visualisation tools:. In order to maximise the effectiveness of these outputs, it is important that project partners use consistent assessment and validation methods throughout the project. A formal assessment of **PoliVisu**'s technical and non-technical components is therefore needed to ensure that they meet performance specifications and have the same impacts as desired by end users.

Although framework and tools development forms the core work of the project and as such is dealt with by the two previous streams, this work also has a bearing on the validation stream, because all the details of key outputs are used here to design and carry out effective measurements of project outcomes. So validation stream is an important phase in which **PoliVisu**'s solutions are tested in a wider demonstration involving external users, including those who are new to the project and may qualify as would-be adopters.

C1. Validation Plan

PoliVisu validation activities will be performed in accordance with the Validation Plan, a draft version of which will be created in the early months of the project and updated with inputs from research and innovation streams as soon as they become available. The plan will guide project partners through the subsequent stages of development and will provide descriptions / definitions of the following: **PoliVisu**'s solution architecture and expected outcomes, assessment objectives, user groups to be involved in validation and methods of validation, among others.

Research Stream	Innovation Stream	Validation Stream

• Data literacy requirements • Policy network actors • Bottlenecks impeding DDDM • Pilot inputs, activities, outputs and expected outcomes as depicted in a logic model • Other	• Big data visualisation requirements as described in the functional analysis • Technical tools to be integrated and used by pilot cities • Other	• Definition / description of • **PoliVisu**'s solution architecture • **PoliVisu**'s expected outcomes • Success indicators (KPIs) • Assessment objectives • User groups to be involved in validation • Methods of validation • Other

A key focal point of validation activities will be impact, or changes brought about by **PoliVisu**'s work and outputs. Expected impacts are of crucial importance because how precisely (or imprecisely) they are described will affect the design and accuracy of validation methods, which in turn will affect the degree of project's success. Equally, it is important to define precisely the different groups of users that are likely to be affected by **PoliVisu**. Are these people connected to the project or are they completely independent of it? Do the users have similar or different skills, backgrounds, data literacy levels and visualisation needs? These are just some distinctions that must be kept in mind because impacts may differ from one group to another in both type and scale, and because any perceptions of benefits (or lack thereof) are also likely to vary from one group to the next.

C2. Demonstration Stages (Piloting)

The European Commission defines demonstration as a "stage of validation [which] will use a sufficiently large sample of users in a real-life situation to provide information on cost-effectiveness, user friendliness and similar issues, as well as testing the feasibility of the system when used on a large scale.[5] With this in mind, **PoliVisu** has defined its demonstration stages as a series of cycles concentrated on testing the functioning, accuracy and effectiveness of technical and non-technical outputs with different user groups e.g. people with different skills, backgrounds and needs, people that are in one way or another associated with the project and people outside the consortium circle who are new to it. Validation methods that will be used at demonstration stages will vary depending on output type. Qualitative outputs like Policy Network Canvas will be validated during new focus groups and interview rounds with external experts. By contrast, technical outputs like WebGLayer components will be tested during scenario-based activities in which both external users and people close to the project will be involved, although not always at the same time.

Scenario Development: PoliVisu pilots, with the support of WP8 team, will develop different scenarios to test technical outputs of the project first in-house and then with external users. The latter will be recruited using online and offline communication channels and may be offered an incentive (e.g. Amazon voucher) as a token of appreciation for their time and effort. In developing pilot specific scenarios project partners will consider the results of work carried out in previous streams (research and innovation) and may supplement any gaps with information collected through desk research. The aim of this task is to create Scenario Cards for use by each pilot during hands-on testing sessions, and the scenarios themselves are designed to stimulate testers' thought processes during such activities.

Output – Scenario Cards that will describe a situation a user will need to imagine before performing a set of predefined tasks during a hands-on session.

Scenario Testing: To understand how effective its tools are, **PoliVisu** will let people play with them. When the right participants attempt realistic activities, one can expect to gain qualitative insights into what works and what doesn't, whether the solution is effective or not and what is causing disappointment or usability issues. Scenario Cards developed in the previous stage will be used to focus users' attention on the task at hand, and together with **PoliVisu** tools and moderators' instructions they will form a unique hands-on experience for the testers. Several organisations participating in this bid have experience of using scenarios as a communications and learning tool, in addition to their established role in testing the robustness and resilience of a range of policy options. This means that as trained facilitators they are well-placed to extract all the relevant information from end users that can be used to refine **PoliVisu** tools and approach.

[5] European Commission - DG XIII (1994b). Telematics Applications Programme (1994 - 1998)

Output – Hands-on sessions with users both within and outside the consortium circle that assess the effectiveness of **PoliVisu** tools.

C3. Evaluation of Validation Results

An indicator is the main criteria of quantitative or qualitative assessment. It is a parameter indicating the performance or impacts of technical and non-technical outputs. Quantitative assessment is often referred to as 'hard' because it relies on a physical measurement to evaluate the results. Use of indicators for qualitative assessment is more problematic because measurement is replaced by personal judgement. This may mean that qualitative assessment is more applicable to measuring user perception (of the effectiveness of **PoliVisu** tools) than to carrying out impact analysis.

Methods of quantitative assessment often include questionnaire surveys while qualitative ones tend to include interviews, focus groups, expert opinions and other less structured way of obtaining information. In using qualitative assessment, it is desirable to be transparent in explaining how the validation results were obtained - for example, who was consulted and how – because of the less structured nature of the approach. A greater degree of doubt must also accompany any assessment of validation results by qualitative assessment for the same reason. A precise definition of indicators for testing physical functioning of **PoliVisu** tools and user perceptions / acceptance will probably have to await the completion of a functional requirements phase, in which case any indicators defined not precisely enough in the draft validation plan will have to be defined precisely in a revised version later on.

The performance and impacts of interventions are usually compared against past or existing practices in order to show their added value. Thus 'Before and After' studies are a useful way of showing progress, assessing user perceptions and measuring the impact of a solution. Such evaluations, however, require reference cases that can vary with category of assessment objectives and may be required for individual indicators or be the same across a group of indicators or assessment objectives.

Equally important to the evaluation process is the definition of success, which defines expectations of performance and impacts of the evaluated solution. The success or failure of validation results are tested against the defined criteria and it is therefore vital to have it specified in the validation methodology. All of the foregoing considerations – definition of indicators, definition of success, reference cases, methods of quantitative and qualitative assessment and occasions on which both will be used – will be presented in the draft version of validation plan. The draft itself will be continuously updated until the final version is released following the completion of functional requirements phase.

Outputs – Validation Plan (draft), Scenario Cards, Scenario Testing Sessions, Validation Plan (final)

1.3.2.2 Pilot Descriptions

The three **PoliVisu** pilots cover a wide range of scales and will be testing using different mobility scenarios:

	Issy les Moulineaux (France)	**Ghent (Belgium)**	**Plzeň (Czech Republic)**
Policy Scale	Large and long term implementation of a new public transport network in the Paris region	Implementation of new mobility policy and development of neighbourhoods in a mid-size city	Automated traffic prediction for road construction situations impacting the traffic in a mid-sized EU city
Policy domain	Public transport	Mobility	Traffic infrastructure
Policy Timing	Long term	Medium term	Short-mid term

Pilot 1: Issy-les-Moulineaux (France)

Policy Challenge: Located in the southwest of Paris, Issy-les-Moulineaux is part of the Grand Paris Seine Ouest urban agglomeration and the Department of "Hauts-de-Seine". Due to this location and economic vitality, this

area of Paris Region must face an important transit as this leads many people from the whole Paris area to come (or transit) to Issy and GPSO for work, using very often their car.

The launch of one of the most ambitious European projects around mobility, the Grand Paris Express, will lead to the construction of an automated metro in the Paris Region up to 2030. This project will highly improve the public transports offer, but it will impact mobility in a negative way. The construction will bring more than 200 km of metro and 68 new stations. Moreover, between all stations, ventilation shafts must be built every 800m, meaning every station will represent various yards, with a large impact on traffic, particularly on important axes of the Region. One of the first lines to be built will highly impact the Grand Paris Seine Ouest, touching 5 cities (Boulogne Billancourt, Vanves, Meudon, Sévres and Issy-les-Moulineaux), being already impacted by traffic in a normal situation. The impact of these road works is hard to estimate as it will influence many areas of the urban agglomeration. This will also impact on pollution, already high in the Region as many alerts have been necessary all along 2016.

The situation makes it even more fundamental to use innovative approaches on the terrain to provide good services and information to citizens and to minimize the impact of road works. To support the overarching Metro/Rail Travel (Grand Paris Express) Policy, and minimise negative impacts on stakeholders and the environment, Issy needs to better manage transport flows daily by:

- Utilising its existing big data streams to estimate the impact on traffic from the forthcoming road works
- Feeding real-time traffic flow information to citizens to change their transport behaviour

Policy Stage: Issy will be co-creating and testing the **PoliVisu** solution through all the stages of the cycle.

Data to be Used: Recently a digital law was approved binding public bodies and companies, such as transport ones, to open in an "open standard" any data of public interest, this should mean that data of public transports is already open or it will be available in 2017. Today, existing and available Big Data in the Region considers Traffic counts on Hauts-de-Seine department, Paris Region Public Transport, Parking availability (off-street), Real Time bus tracking and Bike sharing (Velib'). To improve existing data, Issy is active in stimulating companies (parking, electric car sharing…) and other data providers are stimulated to give access to data in real time. At the same time, actions are taken to be able to collect more and more real time data, also working on installation of new sensors or exploitation of existing ones. Moreover, other actions are considered, to find solutions to crowdsource data. Although, other more traditional solutions are envisaged, such as the use of sensors for on-street parking and the use of existing magnetic sensors to collect data about traffic.

Collaboration Actions: The validation of project solutions on use of traffic flow visualisations to inform transport policy/operations will be conducted through workshops and activities involving various stakeholders' groups:

1. Public administrators:
    a. an internal testers group of public administrators
    b. a local Open Data group aggregating administrators of various Cities and public entities
2. Businesses and Transport agencies: local companies and start-ups having an interest in Big Data and transports working together in a local project, So Mobility, built on a private-public consortium aiming to use digital technologies to improve smart mobility.

Expected Outcome: The creation of an "easy to use visualisation toolkit" making possible to predict and follow in real time congestion on road segments to help users to make the right decisions and allow them to adopt more sustainable behaviours to lower congestion and any possible issues. Being the planning of the road works huge and often requesting quick actions and reactions, it will be fundamental for all the cities of the Region to have tools to allow quick decision making, shorten reactions and allow detection of any important congestion in real time to make effective communications to users.

Pilot 2: Ghent (Belgium)

Policy Challenge: Ghent would like to understand how big data sources can provide valid and accurate information for policy decisions, which may serve as a complement to traditional statistics, but also as entry point to phenomena inaccessible until now by analysing only the traditional registration data. One such example is the large population of students in Ghent, which are not registered in the local population register. Ghent has the

biggest student population of all the Flemish Cities (70.000 students). But only 14% of them are registered residents of Ghent; others stay in student lodgings during the week or commute to Ghent. So, the exact number of students in lodgings or their address is unknown to the city. Their mobility behaviour is not known either, this makes it hard to make urban planning and mobility policy around their needs. The Data and Information Service of the Ghent City Council has extensive experience in providing data-analyses and insights to support operational and strategic decisions, and recognises that big data from mobile phones provides a promising source for enhancing accurate population, migration and mobility information to gain new insights. Understanding the mobility behaviour of students will allow for experimentation with this data to create more effective mobility and urban planning policy that meets everyone's needs.

Policy Stage: Gent will focus on the policy design stage, using data visualisations to identify needs and options.

Data to be Used: Available datasets include mobile data (but a calibration point is needed), Registry, The student lodging dataset, The number of resident non-registered students, and Their mobility behaviour. Other data that can be leveraged for policy visualisations includes information about traffic accidents, traffic density, is available from current data providers. Static traffic accident data and data coming from mobile phone providers. Additional available data includes; Data to check policy implementations like low emission zones. ANPR cameras used for access control of low emission zones. This data can be used to measure the traffic into the city centre; Data to define “trajected control” areas where speed is measured in a zone instead of one spot. Based on data of the average speed (based on individual measurement), the number of accidents and the severity; Measuring freight traffic flows (freight trucks +3,5 ton) by using the on-board toll units.

Collaboration Actions: Ghent will run a series of scenario development and validation workshops with stakeholders to use **PoliVisu** Playbox to evaluate mobility behaviour and identify key policy questions.

Expected Outcome: Thus, Ghent expects to gain a better understanding of the mobility behaviour of students in Flanders and use it to contribute to innovative regional policy making.

Pilot 3: Plzen (Czech Republic)

Policy Challenge: Plzeň (Pilsen in English) is a mid-sized city with the population of 165+ thousand located in the western part of Czechia. The city of Plzeň recently announced its smart city policy, with smart mobility being one of its cornerstones. The city was ranked 2nd in the 2016 Open Data ranking in Czechia, with the largest yearly progress among Czech cities. As in the most modern cities, one of the major problems that the Plzeň policy makers struggle to solve Plzeň is the high traffic during rush hours. The traffic situation is soon going to be worsened by multiple road construction works planned for the coming years by the city, the state and the national railway organisation. In addition, various road closures will occur due to the utility provider’s maintenance of gas and water pipelines, sewerage, and phone, electricity, optical and other cables. These different organisations do not necessarily coordinate their interference into the city's road network, which then causes major traffic issues once several road constructions work occur at the same time.

The main challenge for the city decision makers is to achieve an efficient coordination and planning of multiple road closures caused by different organisations, thus avoiding major traffic problems caused by road works performed at the same time and in the same part of the city. The city representative would furthermore like to have a smart interactive tool that can be used to communicate the schedule of road works and the impact these will have on the city traffic to its citizens

Policy Stage: Plzeň pilots falls in the policy implementation phase of the policy making cycle. There are two types of road works that occur:

- Road construction works that are planned long before, per different policies of several organisations (city, region, state, national railway, utility providers etc.), with start date dependent on various factors such as availability of financing, weather conditions, administrative approval process etc.
- Road works and urgent maintenance caused by accidents and crisis situations, such as water or gas pipelines breach, electricity cables interruption, sewerage maintenance etc. These situations are solved at a short notice and might negatively impact the city traffic if they occur together with larger constructions works of the previous point

The challenge therefore is in the policy implementation phase in a need to better manage operations decisions and to ensure that operations decisions reflect real-time city traffic conditions.

Data to be Used: Traffic model of the city. Data about the planned road works in the city (start date, expected duration, location, extent of road closure: complete, one lane etc.). WMS-t containing the traffic model data currently used for the advanced traffic model visualisation developed by the OpenTransportNet project (link). Real-time and historical data from more than 1000 road sensors installed in the streets and at 90 crossroads with traffic lights (in Datex II format). The real-time data from sensors are sent every 90'' to the server located at the city's traffic management centre Traffic information crowdsourced data provided by Waze within the Connected Cities Data Exchange programme (https://www.waze.com/ccp, Plzeň application being currently processed). OpenTransportMap - a routable, INSPIRE compatible map of EU that allows routing and dynamic Visualisation of traffic volumes (provided by Plan4All)

Other available data sources: Public transport schedules and real-time position of public transport vehicles (GPS modules in the vehicles). Datasets available at the Plzeň Open Data portal: https://opendata.plzen.eu/dataset . OpenLandUse Map - Open Land-Use Map is a composite map that is intended to create detailed land-use maps of various regions based on certain pan-European datasets such as CORINE Landcover, UrbanAtlas enriched by available regional data. Currently available for Latvia, Czech Republic, Slovakia and Flanders in Belgium (provided by Plan4All). SPOIs dataset - Open and seamless SPOI data set, which is based on Linked data principles, contains over 23 million Points of Interest important for tourism from around the world (provided by Plan4All)

Collaboration Actions:

Crowdsourced data: Plzeň already has crowdsourcing mechanisms in place. **PoliVisu** will therefore focus on the analytics and visualisation of the available crowdsourced data to support evidence-based policy making.

Crowdsourcing problems and issues in the city: Plzni.to is a city crowdsourcing tool for issues reporting with more than 2000 issues reported at the moment by the Plzen citizens. These issues cover various areas, ranging from vandalism damages on benches, street lighting and public transport stops, overloaded and missing trash cans, wrecked abandoned cars at the streets, children playgrounds, trees and bushes to maintain, to potholes in the streets etc. **PoliVisu** will use its tools to analyse the crowdsourced data and to gain deeper insights on the problems reported by the citizens. These findings shall be used to support policy making and take policy measures to prevent the occurrence of these issues in the 'riskiest' areas of the city.

Waze crowdsourced traffic data: Plzeň currently initiated the registration process for the Waze Connected Cities Data Exchange programme (https://www.waze.com/ccp). The crowdsourced data provided by Waze (combined with the road sensor data) shall be used to further enrich and improve the traffic modelling capabilities of the **PoliVisu** solution.

Expected Outcome: Summary: An **efficient coordination of road works in the city** thanks to a **traffic prediction tool** that is based on automated real-time recalculation of the city's traffic model after a traffic issue is submitted through a city-manager dashboard.

The **PoliVisu** solution for Plzeň will be based on the prototype visualisation of the traffic volumes developed during the OpenTransportNet project in 2016 (link to the app). The Visualisation allows Plzeň authorities to consult the traffic changes during the two-planned road construction works. Plzeň citizens can also use the visualisation to avoid streets with heavy traffic, for example by using tram instead of a car. To develop this visualisation, the traffic changes were first calculated 'offline' in a desktop software and the data was subsequently manually processed into a WMS-t that allows the current dynamic web visualisation of four different traffic situations [6]. The web visualisation has been published by the city administration to inform the public about the expected traffic disturbances during these roadworks.

The **PoliVisu** solution will take the above-mentioned traffic app further. **PoliVisu** will develop a tool/dashboard that provides city managers with a traffic modelling tool that will allow better planning of multiple (overlapping) roadworks. Once a planned roadwork is reported through a dashboard by a city manager, the tool will autonomously re-calculate the traffic model of the whole city [7], thus allowing to immediately consult the impact

[6] *A being Mikulášská street and B being Karlovarská street: A and B open (usual traffic); A closed, B open; A open, B narrowed* to one lane; A closed and B narrowed to one lane

[7] The close-to-real-time traffic model recalculation requires a significant computing power which has not been available until recently. However, the recent availability of distributed server infrastructure and parallel cloud computing technologies (e.g. the Amazon web services), and the research of the MapReduce programming model done by the PoliVisu team allows to perform such big data calculation in almost real-time which makes it usable for these web applications

of the planned roadwork on the city traffic. Such insights shall then be used by the decision makers to efficiently coordinate roadworks and most importantly, to avoid overlaps of multiple major works that would complicate the traffic flow beyond an acceptable level.

A public web access to the traffic modelling tool will be a part of the solution. The citizens will thus be able to consult online the expected traffic in the city at any day and hour in the coming year, discover all the planned road works in the city, and explore the negative effect these works will have on their daily commutes.

The use of the traffic modelling tool is not limited to the efficient planning and public announcement of road works. It might also be used to (a) predict changes in the city traffic for any major event in the city, e.g. a football or ice-hockey game, large music concert, festival in the city centre etc. Under this scenario, the city manager submits the scheduled event with the estimation of visitors/cars in the dashboard and the traffic management tool recalculates the city traffic model for the date/hour in question; (b) predict traffic changes caused by a traffic accident reported by a city police officer. Such a traffic forecast can then be used by the city traffic management and police to better manage the traffic flow by diverting cars to less blocked streets, either remotely by traffic lights or by policemen physical interference.

The Plzeň pilot scenario will also rely on the historical and real-time road sensor data (from more than 1000 road sensors) and crowdsourced traffic data from Waze which will be used to calibrate and refine the existing traffic model of the city. Other available data might be also used, e.g. the real-time GPS position of the public transport vehicles (trams, buses, trolleybuses). The proposed solution fits in Plzeň's smart city strategy built around an effort to make its services more aligned with and responsive to citizen needs and in line with the evidence-based policy making approach. The city administration is therefore willing to adopt and use the traffic modelling tool in its daily operation after the project comes to the end, and to work further on its potential improvements.

1.3.2.3 Sex and Gender Considerations

Women tend to have different transportation needs, travel behaviours and levels of access to transport services and infrastructure than men. They usually travel shorter distances, walk more, drive less and are the main users of public transport. Women are more sensitive to safety concerns and tend to limit their movements and activities because of the heightened perception of risk. In terms of employment, transport sector has more male workers than female workers, including in positions with decision-making powers. Consequently, these factors have an impact on how transport policies are understood, designed and managed, and how gender-balanced they are.[8]

Acknowledging the importance of sex and gender considerations in transport, **PoliVisu** will integrate gender perspectives into its work in accordance with guidelines specified in Gendered Innovations[9], GenderSTE[10] and RRI Tools.[11] On the implementation level, this means that project's research stream will be managed by teams with a balanced male to female ratio; in co-design activities like workshops female representatives will be given as much voice as men; when disseminating project results women will be one of the key target audiences to learn about **PoliVisu**'s achievements and developments; and when providing recommendations to decision-makers gender perspectives will be fully highlighted to ensure policy outcomes benefit both sexes in equal measure. On the project management level, female partners will occupy a central role in the decision-making process. They will drive the overall gender agenda to make sure that all project activities in the field and within the consortium comply fully with responsible research and innovation practices.

1.4 Ambition

Before configuring the pilot demonstrations for **PoliVisu**, the Consortium undertook a high-level review of the state-of-the-art in: (A) The use of data for decision/policy making in the public sector, and (B) The use of big data for visualisations. This research will be continued at the start of the project, but initial findings highlighted in the section below, show how **PoliVisu** goes beyond the state-of-the-art in all these areas to deliver an original solution for data-driven policy making.

[8] http://www.genderste.eu/i_transport01.html
[9] http://genderedinnovations.stanford.edu/
[10] http://www.genderste.eu/
[11] https://www.rri-tools.eu/gender-equality

1.4.1 Data Driven Decision Making in the Public Sector

Whilst not as prolific as in the private sector, Government has started to utilise their data to react to citizen demands and concerns, and to even proactively anticipate an issue before it develops into a crisis. Examples of advanced data-driven decision-making happening right now within public agencies across the globe include:

Citizen Complaints: The Hong Kong government's Efficiency Unit[12] acts as single point of contact for many government departments to handle citizen complaints and suggestions. Each year, the unit receives 2.65 million calls and 98,000 emails. The office partnered with a text mining firm to build a complaint intelligence system to analyse all the data and uncover patterns to help establish the root causes of many problems. Report generation is shortened from one week to one click, and the responsible department is immediately informed of issues.

Transportation: West Virginia's Department of Transportation[13] continuously tracks traffic at 2,500 spots around the state to understand a variety of components such as average daily traffic, vehicle type information, intersection turning movement information, and annual vehicle miles. The information is used by the planning team to plan infrastructure enhancements and prioritize new construction projects.

Utilities and Energy: Eastern Denmark used to work with 16 partners to balance electricity supply on a daily basis in order to anticipate the right amount of power consumption and production needed. After partnering with Copenhagen Energy, which drove the use of data driven decision making, consumption can now be predicted on an hourly basis to minimize production waste[14].

Education: Countries economic development and competitiveness needs a high-quality education programme across all levels of schooling. Delivering education through a blanket approach does not help every student reach their full potential as students have different needs, competences and capabilities. Data driven decision making can be used to determine personalised education plans, enhance curriculums, plan staff recruitment and even offer the optimal location for new education buildings.
Going a step further and actually using the data for official policy making is still largely confined to theoretical concepts or only specific types of data rather than a sufficiently large combination thereof. Previous projects financed through Horizon 2020 and FP7 funding as shown below have made great strides in pushing forward open and linked data on a more technological level in public administrations, but take up has been low. Additional projects (whose members are part of **PoliVisu**'s expert panel) that supplement the ones in chapter 1.3.1.7 include:

ASK[15] is an innovative concept providing a 'data broker' model to connect policy makers and young people over Twitter. The data broker dashboard is specifically designed to reformulate dry policy texts into more engaging material that will spark reaction from both young people and policy makers fuelling debate and insights that close the gap between what policy makers think young people care about and the actual needs/concerns of youth. The project is currently live and includes **PoliVisu** partner 21c in the consortium.

COCKPIT[16] (Citizens Collaboration and Co-creation in Public Sector Service Provision) explored how Web 2.0 social media could be used for collaboration and cooperation between citizens themselves, and between citizens and public administrations. Their resulting model is still widely referenced today.

Puzzled by Policy[17]**:** Puzzled, designed by **PoliVisu** partner 21c, used algorithms and apps to create a tool that after a short, fun, interactive quiz plotted a user (citizen) on a political dimension map so they could see other groups/communities/organisations that shared their viewpoints. Policymakers benefited from the analysis of the data seeing where general consensus lay for specific issues around immigration.

[12] http://www.eu.gov.hk/en/index.html
[13] http://www.transportation.wv.gov/highways/programplanning/plan_conf/Documents/2011PC/GTI__Section.pdf
[14] http://cleancluster.dk/wp-content/uploads/2015/05/Co-creating-the-cities-of-tomorrow.pdf
[15] www.ask-project.eu
[16] http://www.igi-global.com/article/citizens-collaboration-creation-public-service/70075
[17] www.puzzledbypolicy.eu

WeGov[18] provided social networking technology to deliver new opportunities for policy makers (eGovernment) to engage with the community (eSociety). The project delivered a toolkit for policy makers helping them to take advantage of new (at the time) channels such as Facebook and Twitter.

OCOPOMO[19] (Open Collaboration in Policy Making) addressed two levels of scientific and technological advancements: 1) Socio-political: to formulate, model, evaluate and monitor social and economic policies of governments, which are supported by 2) Scientific and technological innovations.

CROSSROAD[20]: Created a participative roadmap for ICT research in electronic governance and policy modelling. The roadmap identified emerging technologies, new governance models and novel application scenarios in the area of participation, electronic governance and policy modelling, leading to the structuring of a beyond the state-of-the-art research agenda, fully embraced by research and practice communities.

WAVE[21]**:** (Welcoming Argument Visualisation to Europe), a project with **PoliVisu** partner 21c, explored how an argument visualisation modelling platform could be used to break down complex policy arguments into easily understandable bite size chunks and bring citizens into the debate. The platform was critically well regarded but too complex for the average person to use. The debategraph tool is still in use today by academic organisations and media platforms such as The Guardian online.

PoliVisu goes beyond the state-of-the-art in data driven decision making in the public sector by (1) bringing in a true collaboration aspect to the process. **PoliVisu** makes the data easily understood by a range of stakeholders who provide feedback into the decision/policy process via traditional methods or via social media. (2) **PoliVisu** removes the need for replacing or adding another platform into a city's mix of management tools as its modular and reusable components can be integrated in existing solutions (for instance a city's existing website or citizen participation platform). (3) **PoliVisu** is designed to be transferable so whilst it is tested in the smart mobility arena it can be used for any area of policy making where geo-data is relevant, such as infrastructure planning, environmental strategy, energy use etc. Finally, (4) whilst **PoliVisu** provides technical tools the Framework is actually technologically agnostic and can be flexible adapted to accommodate future new components with ease.

1.4.2 State-of-the-art for Data Visualisations

Recent explosion of data in terms of size has been accompanied by a proliferation of tools offering effective and appealing data visualisations. Existing solutions on the market include desktop applications that are used by non-experts and the more technically minded alike (e.g Tableau[22], R[23]), JavaScript libraries that are popular with developers (e.g. D3[24], Leaflet[25]) and web applications that cater for both audience types (e.g. CARTO[26], Mapbox[27]).

Because data is increasingly about interactions and relations, it is hardly surprising that cutting edge visualisation tools must be able to deal with complex connections and networks. Geospatial and interactive features are also important as they allow users to plot data on customisable maps with additional location based information and to pan or zoom to particular points and interact with them to see any extra details. For next generation tools time resolution functionality, which allows to observe temporal patterns, is equally important, as are 3D and animation capabilities.

Perhaps a somewhat less intuitive requirement for next generation tools is that they should be accessible to experts and non-experts alike, while acting as a knowledge base and centralised hub for visualising different types of data in unique and innovative ways. To tick this requirement, they should be made accessible via a web

[18] http://www.wegov-project.eu/
[19] http://www.ocopomo.eu/results/presentations/crossroad-ws-ifip-egov-2010/files/ocopomo.pdf
[20] http://is.jrc.ec.europa.eu/pages/EAP/CROSSROAD.html
[21] http://www.participatedb.com/projects/15
[22] https://www.tableau.com
[23] http://www.computerworld.com/article/2497304/
[24] http://www.d3technologies.com/
[25] http://leafletjs.com/plugins.html
[26] https://**carto**.com
[27] https://www.**mapbox**.com/

application to eliminate the need to install special software, and their interface should be simple and intuitive to encourage data interaction for the average user and eliminate the need for coding.[28]

PoliVisu goes beyond the state-of the art in data visualisations by combining several elements of the tools above to focus on displaying policy scenarios in a holistic manner. The result is an integrated data presentation where map, graphs and tables are linked in an interactive way. **PoliVisu** focuses on very powerful map visualisation and data selection options and integrates several live data feeds coming from a variety of data sources. The possibilities for displaying the results of selection and analysis is far more advanced than in existing online GIS or map visualisation tools. **PoliVisu** also advances the state of the art in data modelling as close-to-real-time traffic model recalculations requires a significant computing power which has not been available until recently. The research of the MapReduce programming model done by the **PoliVisu** team and the recent availability of parallel cloud computing technologies allows to perform such big data calculation in almost real-time which makes it usable for these web applications. It is planned that the automated traffic volumes forecasting for multiple (overlapping) road works will be implemented for the Czech and French pilots.

1.4.3 Innovative Potential

Combinatorial Experimentation: As more and more public administrations begin to embrace and implement the concept of a smart city, the amount of data, including real-time datasets, being generated is enormous and constantly growing. This presents both an opportunity and a challenge; an opportunity because new data can reveal how cities function at ever smaller scales and over very short time periods; a challenge because the amount of new data that is being generated is so huge that it is not possible to visualise it all, which means most of this information will be 'lost' or unused. The problem of 'too much data' can also limit the capacity for experimentation, forcing users to focus on fewer data sources than they may otherwise would. Such a selective approach can in turn limit big data's potential to reveal hitherto unsuspected or unobserved patterns as its **real added value lies in combinatory use with other data sources**. As an acknowledgement of this fact, **PoliVisu** assembled a consortium covering several data sources (e.g. social media, sensors, repositories) and provides tools (e.g. WebGLayer, Geosparc, Micka, TruthNest) for effective combinatorial experimentation with them all.

Holistic Policymaking: The idea that government should base its decisions on data, evidence, and rational analysis is not new or inventive. What's new is the opportunity created by **PoliVisu** to crystallize problems and highlight a range of effective solutions. It's hard to believe that current policy making persists much as it always has, even though technology has raced ahead and decision-making is transformed in the private sector. **PoliVisu** helps provide a broader vision to modernise and revolutionise national and local government. Too often, the various steps discussed above—technology deployment, data generation, policy development, and impact measurement—are pursued almost as separate enterprises, with little thought given to how they connect to and support each other, but **PoliVisu** brings these components into a coherent whole to implement data-driven policymaking.

Smart City Data Infrastructure: **PoliVisu** provides the start of a robust data architecture for smart cities, helping to identify and address some of the data gaps, the lack of systematic analysis, and poor information management and dissemination that currently hinders the use of data for policymaking.

Data-driven Leadership: Less tangible but equally important is the need to change the way we think about policymaking. Refined data permits more targeted, tailored, and experimental policymaking. Success depends on recognizing these opportunities and devising new approaches to take advantage of them. **PoliVisu** provides a first step to breaking down these barriers, and help cities reap the benefits of a data-driven government that is more effective, efficient, open, and accountable.

[28] http://www.itf-oecd.org/sites/default/files/docs/15cpb_bigdata_0.pdf

2. Impact

2.1 Expected impacts

The table below highlights how **PoliVisu** will deliver the impact expected by the call.

Expected Impact	How PoliVisu Delivers
Expected Impact:	
Proposals need to demonstrate the impact to be achieved after the project phase, inter alia, in terms of improved public policy effectiveness, efficiency gains, precision gains, improved consistency and reliance on evidence leading to increased policy compliance	**PoliVisu delivers measurable impact by:** • Increasing data literacy amongst European administrations so they can better utilise data to inform policy development • Evolving the policy making cycle into a continuous policy experimentation approach to stimulate innovation and transformational change • Using collaborative approaches in the policy making process, so that policy is informed by a broad range of input and expertise and meets user needs • Applying new data analytical and visualisation techniques, insights and digital tools so that policy is data driven and evidence based • Utilising data from a variety of different sources - social media, sensors etc. - to create more accurate policy impact predictions • Monitoring, testing and iteratively improving policy to meet complex, changing user needs and making sure it can be successfully implemented
Democratic dimension, such as greater transparency, good governance, increased trust in and the perceived legitimacy of government.	**PoliVisu makes policy making more democratic by:** • Delivering transparency by clearly showing potential/real impact of mobility policies in an easy to understand manner - visualisations • Increasing trust in decision making by using data to present one version of the truth for all stakeholders to openly and collaboratively work with • Amplifying perceived legitimacy of government by responding to citizens' concerns through co-created policy solutions resulting in improved effectiveness of outcomes
Additional impact may be increased accessibility to the non-governmental players.	**PoliVisu delivers added value by:** • Harnessing the levelling power of visualisations to facilitate easier inclusion of non-government players in the decision-making process e.g. citizens, businesses, NGO's • Ensuring increased accessibility by enabling the policy visualisations to be embedded in any website or existing platform for ease of sharing • Leveraging existing conversations on social media from non-government players for input into the policy process

The adoption of **PoliVisu** ensures policy teams receive the support they need to enhance the effectiveness of their policy making processes, and citizens and other stakeholders are given the opportunity to become valuable policy influencers and solution co-creators. The ability to quickly experiment and understand the impact of a variety of policy solutions will result in saved time and costs. Impact will be demonstrated and extrapolated from the pilot sites who will use the **PoliVisu** methodology and tools for real life policy scenarios, enabling measurement of both quantifiable and qualitative impact measures on their internal processes and to their smart mobility policy outcomes. The results will be transferred across Europe through free training and sharing of the **PoliVisu** Playbox.

2.2 Measures to maximise impact

The Consortium understands that **PoliVisu** cannot achieve true success unless the results and outcomes scale beyond the project to provide wider market and technological impact. To ensure maximum impact is achieved, the Consortium will develop an **Impact Enhancement Roadmap** (also known as an advanced Communication and Dissemination Plan). This coherent, easy to follow document will outline three strands of activities (i) General Dissemination, (ii) Specific Communication, and (iii) Targeted Exploitation. Including all these activities within one Roadmap will ensure that the projects innovative promotional strategies and tactics within each of these streams will be complementary, working efficiently together to achieve future sustainability and long-term success.

2.2.1 Dissemination and exploitation of results

Work package 7 is dedicated to the dissemination, communication and exploitation of the project's results. The end goal being the creation of exploitation opportunities for **PoliVisu methodology and tools** across Europe in order to multiply its impact and deliver sustainability. Specifically, the main objectives will be: (1) identifying the most appropriate sustainability model and putting it into action, and (2) reaching the widest audience of stakeholders in the sector as well as strengthening collaboration links with partners, in order to establish a wide network with potential administrations interested in adopting **PoliVisu** outcomes. A full analysis matrix of stakeholders and areas of interest will be created as part of the Impact Enhancement Roadmap to ensure **PoliVisu** engages specific audiences with tailored message at the right time through the most appropriate channels.

2.2.1.1 Exploitation Strategy Approach

PoliVisu aims to transform policy identification, production and delivery in Europe by giving Public administrations and their stakeholders the tools to develop advanced, flexible, policy options that keep pace with rapidly changing citizen expectations. **PoliVisu's** unique system of web-based data analytics tool provided as 'Software-as-a-service' (such as WebGLayer) will make it faster, easier, and cheaper for even the smallest public administrations providers to use big data for Visualising and communication policy options. In order to deliver this ambitious vision, the Consortium will start with a rigorous programme of market analysis to identify current challenges and trends in using big data for policy making, as well as analysis of the Digital Single Market strategy that **PoliVisu** will need to take into account for future positioning. The outcomes of which will help to tailor **PoliVisu** outputs to the precise needs of a rapidly changing and budget-conscious government market bound by public procurement rules. The following strategy, executed over the lifetime of the project, will deliver a market-ready solution by mid- Y3 of **PoliVisu**'s development cycle and ensure a viable and sustainable customer base before the end of European financing. To deliver the **Sustainability Model**, exploitation of **PoliVisu** will take the form of 3 distinct 'waves': Wave 1: Exploration; Wave 2: Implementation; Wave 3: Acceleration.

WAVE 1: EXPLORATION - At an early stage in the project, the **PoliVisu** exploitation team will conduct market research including a Value Network analysis (also part of the research stream) and collaborative Business Model Clinic with the full range of stakeholders. The outcomes of which will help partners in WP8 create a clear picture for the exploitation of project results as part of the design, development, and implementation of the use cases. Through this integration of business parameters from the very start to the end, **PoliVisu** achieves 'impact by design' for the pilot locations, thus ensuring sustained post-project exploitation. Value Network Analyses (VNAs) are qualitative in nature and are useful whenever sustainability modelling rises above a single organisation level. VNAs aim to take into account the differing and sometimes-conflicting interests and motives of stakeholders from a variety of industrial or public fields. The value networks are developed using qualitative data gathered from a blend of desk research, in-person interviews and public workshops.

Running concurrently with the VNAs, the Business Model Clinics (BMCs) will focus on the development of suitable business models for the exploitation of the **PoliVisu** tools. **PoliVisu**'s BMCs will take into account the needs of all stakeholders who could be potential competitors, customers for or consumers of **PoliVisu's** services to generate a 360° of the business landscape. BMCs will factor in social, technological and economic performance under an evolutionary perspective in order to assess the desirability of the different business models from different stakeholder perspectives and arrive at a balanced approach that maximises both stakeholder value and commercial viability. This business modelling technique is based on a multi-criteria approach which will use

different data sources including in-field investigation, opinion leader interviews, living lab consultation groups and social-network short-form surveys and virtual business simulation to arrive at an optimal result. By analysing the results from both the VNA and BMC's, **PoliVisu** will arrive at an optimal value model/common approach for the developed technologies within the dynamics of the current market place. The outcomes will serve as a blueprint for further exploitation scenarios in Wave 2 and Wave 3.

WAVE 2: IMPLEMENTATION - In this stage, the impact activities of the project take on a much more pronounced (and targeted) communication role on top of the exploitation activities. Here **PoliVisu** will organise, based on the previous work in Wave 1, collaborative Business Modelling Workshops with the pilot countries. This activity constitutes all countries of partners in the consortium. In these workshops, partners will explore with local stakeholders the business models for adoption of the **PoliVisu** component parts in their value networks. These workshops will lead to grounded and granular individual exploitation plans – started in the table below - (including value models and business rules) for all partners in the project, and a clear way forward for rolling out a commercial version of **PoliVisu** nationwide in the respective countries. Supporting the workshops will be the touch-screen lightweight business model simulator BEMES, which was developed by the Future Internet Programme (FI- PPP). By organising the workshops iteratively and starting relatively early on in the project, we expect to have additional 'stand-alone' exploitation scenarios with measurable results by the final review of the project. The workshops will also entail the education of local stakeholders through dissemination activities to ensure understanding of the potential of **PoliVisu.**

Partner Exploitation Plan	Potential Sector	Route
Information Flanders: Awareness raising of the importance of data visualisation for policy making in Belgium. Enhance the use of Belgian big data source by making the data available as open source in usable data formats.	National and Regional government in Belgium	Promoting **PoliVisu** results through speaking opportunities at regional workshops and conferences. Sharing news and findings through official government communication channels. Targeting local administrations directly within **PoliVisu** newsletters.
IS-Practice: Business development for **PoliVisu** tools on the EU market, delivery of the commercial contracts within both public and private sectors	Public sector in EU countries, from city to national level. Private sector	Building new commercial relationships, leveraging existing partnerships, identifying new market opportunities
EDIP: Broadening market reach for traffic modelling capabilities across the EU	Public sector transport departments	Partnering with other **PoliVisu** partners to increase offering and geographic coverage
ISSY Media: Increase use of Big Data in local policy making processes, with a particular focus on transport, urban planning and management.	Local, Regional and National public sector. Private sector.	Continue to use **PoliVisu** framework and tools to facilitate stakeholder collaboration for more efficient urban management. Promote results and use of data to stimulate new economic opportunities for businesses.
HSRS: Enhancing current skills in area of big data discovery and citizens observatories. Build new solution for target market of HSRS in public sector. Find new partners for cooperation on commercialisation	Public sector. Private sector - organisation dealing with transport data	Offering integration, consultation services and services related with data transformation and visualisation. Offering SaaS type of services
GEOSPARC: Enhance geospatial expertise in analytics and visualisation with big data knowledge. Extend Geosparc product offering with big data support. Potential	Public Sector. Private Organisations in diverse sectors	Consulting and software engineering services. SaaS solution

collaboration with project partners in a JV to commercialize certain project results.		
InnoConnect: Enhance data analytics & Visualisation services, extend product offering, integrate our services with 3rd party solutions	Both public and private sector	Building new business relationship via **PoliVisu** network, entering new markets
Cityzen Data: Will expand use of technical software platform (Warp 10) to manage and analyze mobility data- including predictive - data coming from sensors, IoT, meters. Will use project finds to advance knowledge of smart city data infrastructures.	Private and public sector - Energy, Mobility, Cars, Traffic, Telecoms, IT, Cybersecurity	Improved offering to customers - IoT data management and data analytics features, tools and data analytics language to applications within the project and new interfaces regarding geomatics requirements.
21c: Enhance existing consultancy offering, create big data policy training and potentially be involved in rolling out new **PoliVisu** deployments commercially with other partners	National and Local Government, UK, Poland, Lithuania	Offer services via usual tender channels. Add to G-Cloud for easier procurement
ATC: Expand use of truthnest in other geographies and domain areas creating new market opportunities	Global markets both public and private	Use new case studies and business case to promote truthnest to a wider market.
SITMP: Further post-project use of advanced tools for policy making in the area of smart mobility	Public sector in Czechia, focus on cities	Promotion of **PoliVisu** results via the city channels, sharing best practices and know how among Czech smart cities
MACQ: The **PoliVisu** outcomings will take the Macq M3 Smart Mobility Platform to the next level. From Sensor Data to Secure Anonymised Big Data. From Smart Visualisation to Policy Decision Making Support and finally Policy Implementation.	Our introduction to the Flemish market will allow us to develop this product and then expand it into our foreign markets.	In Flanders region we will showcase the possibilities of **PoliVisu**. Given our market share the mobility centres of the Brussels Capital Region are the next logical step already at the end of the project.
Plan4all: Exploitation of data sets and tools, which are currently manage by Plan4all (Open Land Use, Smart Point of Interest, Open Transport Map). Expand the Plan4all network	Public and private sector	Offering consultancy services in cooperation with all Plan4all members
POLIMI: Expand the adoption of an experimental approach to policy making by the **PoliVisu** use of big data in several institutional networks	National and EU local governments	Use case studies and business case within the Italian Association of Municipalities and scaling up to EU Covenant of Mayors
GENT: Use enhanced capacity for mobile data sensor data to use in other areas of city planning and policy making	Local government	Continue to use **PoliVisu** framework and tools to facilitate stakeholder collaboration for more efficient urban management. Promote results and use of data to stimulate new economic opportunities for businesses.

Looking at individual exploitation aims and plans will help **PoliVisu** create an exploitation strategy/plan for the non-commercial results of the project, which will be used to support commercial endeavours. The findings will be used to update the Impact Enhancement Roadmap.

WAVE 3: ACCELERATION - In this stage, the strategy focuses on both (1) depth and (2) breadth of the project outcomes to ensure uptake, impact, and post-project sustainability. The depth strategy focuses on technological integration, whilst the breadth strategy focuses on broad uptake by stakeholders. In terms of **depth**, **PoliVisu** will reach into its own and affiliated networks with the GI community such as Plan4All association members and their networks, pilot channels. Via various on-going working relationships with these networks, **PoliVisu's** solution will be positioned to be superior to existing alternatives so it can be positioned as THE standard for data-driven policy making. In terms of **breadth, PoliVisu** will focus on capacity building of public administrations across Europe by offering free training to new public administrations through affiliated general networks such as LOLA (Linked Organisation of Local Authorities), Eurocities (Gent is the president), SmartCitiesCouncil, amongst others. The Consortium will use the training to encourage public administrations to embed the **PoliVisu** approach in their operations, and offer commercial incentives to use its tools.

2.2.1.2 First Draft Exploitation Plan

a) Vision Statement: The **PoliVisu** vision is to make policy experimentation using data visualisation the de facto way that public administration policy teams deliver open policy making across Europe.

b) Mission Statement/Value Proposition: PoliVisu transforms European policy design, implementation and evaluation by giving Public administration Policy Teams everything they need from principles, techniques and processes to advanced technology tools (processing, analytics, visualisations, and sharing with citizens) to create and deliver innovative, effective policy solutions that keep pace with rapidly changing citizen expectations. Harnessing available city data – open, private, social – into a trusted open source solution that works with a city's existing policy platform, **PoliVisu** removes traditional technological and data literacy barriers and enables public administrations to access the same levels of advanced visualisations, that large consultancies would provide, at a fraction of the cost. Thanks to **PoliVisu**, 'data' redefines the way public policy teams collaborate and operat**e.**

c) Target Market: Public sector in Europe, namely (but not only) on municipal and regional level, targeting Policy Makers – Mayors, Council Leaders, Cabinet Members and Overview and scrutiny committees - Overview and scrutiny is at the heart of city accountability. It is the principal, democratic means, between elections, of ensuring that decisions made by the council and its partners are held to account.

d) Sustainability: PoliVisu ensures sustainability of the project results by ensuring all the outputs of the research - **PoliVisu** Framework, support material, training collateral, research data, white papers etc - are openly available on the **PoliVisu** website, with relevant material published on partner and network sites and passed to additional research initiatives that can utilise the results. Project partners will promote the results and outputs in their everyday activities, from speaking engagements, direct sales contacts via their business networks, to social media sharing. The technical components of the **PoliVisu** visualisation tools are open source so are freely available for adoption, and project adaptations of the tools will be published in GitHub.

e) Business Model: PoliVisu Partners will work together in various configurations to offer commercial consultancy, advanced data analysis & visualisation tools, customisation of technical tools, and technical support for using the technical tools to create complex visualisations at an affordable cost to cities. The mechanism for these partnerships will be decided during the Exploration WAVE activities. One option, which already has been proved by business reality in other EU projects, i.e. OpenTransportNet, is a loose partnership arrangement, within a not-for-profit association like Plan4All. In this model consortium members agree to share revenues from new businesses while individually bearing the costs of working on a project, either alone or as a group. Revenue sharing triggers will be tied to the amount of work the partner will be able to carry out or commit to. If the partner can deliver the project alone, and assuming the partner onboarded the client directly, not through referrals or other intermediaries, then no revenue sharing with other partners shall be triggered. If the partner lacks skills to deliver the project alone, or if the partner decides that it would be more efficient to work in a group, then a percentage of new revenue will be shared between the partners involved. If the partner finds a customer but has no skills relevant to the project, or if the partner decides that it is more beneficial, commercially or otherwise, to focus more on new business development (NBD) and less on project delivery, a fixed commission for NBD is in order. The customer will then be handed over to a partner, or a group of partners, that agrees to take charge of the

project. A small share of the revenue for the 'umbrella' non-profit organisation may also be considered to cover costs for IT infrastructure maintenance and engagement activities.

f) Market: The core enabler of **PoliVisu**'s technical solution is the ability of its tools to use geospatial data. Therefore, **PoliVisu** will sit in the geospatial industry space offering services to enhance policy and governance operations. The geospatial industry in Europe is composed of several sectors – hardware, software, consulting, solutions and services – of which the latter is the greatest in terms of market share (hardware's is the smallest).[29] In recent years, however, there has been a clear trend towards a 'solutions approach,' whereby businesses combine technologies from hardware and software to provide an optimal offering to customers. This approach is in line with **PoliVisu's** ambition for combinatory experimentation, which seeks to mix and match different data sources, tools and services to create a unique solution for policymakers in Europe.

Based on information available from open sources, the size of GIS market globally was estimated to be $10.6 billion in 2015,[30] while Europe's was projected to reach $3.3 billion by the end of 2016.[31] To the extent that these figures are accurate, Europe was accounting for a third of the worldwide GIS market in 2015-16. However, within a specific niche – geospatial analytics - Europe accounted for the largest share in the global in 2015. A large part of geospatial services offered by the European companies, as to be expected, is in one way or another related to data. The most common type of service on offer is data processing, which is followed closely by data acquisition, analysis and management. Data, it seems, is at the core of geospatial industry, driving its revenues and creating opportunities for specific sectors, like data analytics, to flourish.

In terms of revenue sources, in Europe they are split almost equally between private (56%) and public (44%) sectors.[32] The share of private sector is likely to continue to grow given the continued proliferation of data and its use by industries such as banking, telecom, insurance, logistics, gaming and retail. Public sector, for its part, makes its contribution particularly visible in areas like infrastructure, environment and climate change, disaster management, land use, utilities, public safety and homeland security. Within public sector, government is going to be a major contributor to the industry's growth as it continues to seek customized, integrated, enterprise level GIS solutions that can enhance public services, national infrastructure and security.

PoliVisu enters the market at a time of high demand for GIS related services. Thanks to its unique expertise, approach to data visualisation, collection of tools and methodological framework the project is well-placed to meet this demand in public sector and even to go beyond that by offering new perspectives on policy-making through the use of big data.

g) Route to Market: To ensure that the **PoliVisu Playbox** delivers on its Mission Statement, the team has thoroughly considered in advance the best route to market and devised an initial marketing strategy for growth:

1. Marketing Objectives:
   - To position **PoliVisu** as a transformational solution enabling Policy Makers to create innovative policy solutions that produce efficiencies and cost savings
   - To demonstrate the financial, technical and operational advantages of using **PoliVisu**
   - To establish **PoliVisu** as the standard for open and data-driven policy making
   - To create a strong ecosystem of cities/policy makers around the **PoliVisu Playbox** who can support each other and continue to enhance and refine the framework and processes

2. Marketing Messages. **PoliVisu** will focus marketing material around the following core messages:
   - **PoliVisu** helps Policy Makers across Europe use their city data to unlock innovation and deliver new and effective policies
   - **PoliVisu**'s flexible, component architecture works to enhance cities existing policy making platforms

Marketing Tactics: **PoliVisu** will be promoted across Europe by core members of the project team – all of whom know the solution and the project results intimately and have direct access to actors who will assist in the

[29] http://geospatialmedia.net/european-geospatial-business-scenario.html
[30] https://www.gislounge.com/gis-industry-trends/
[31] http://www.businesswire.com/news/home/20130625006392/en/Research-Markets-GIS-Market-Europe-2012-2016-Increasing
[32] ibid.

promotion of the solution through their cities and networks. Thus rather than commissioned salespersons (who often have limited product knowledge and direct access to purchasers), **PoliVisu** will leverage the extensive collective expertise and professional networks of the consortium to drive adoption. An offering of free training workshops will be used as an incentive to hook administrations into understanding the benefits of data-driven policy experimentation which not only builds capacity for the policy makers but also provides a potential chance to sell **PoliVisu** consultancy to create bespoke visualisation models. The pilot leads will act as **PoliVisu** champions and will be featured in case studies and other exploitation materials as well as continue to act as demonstration sites for potential adopters to visit or use to speak to peers. **PoliVisu** will rely heavily on online marketing, but also use regular appearances at major industry events and showcases. In addition, as **PoliVisu**'s network of other similar projects grows, the team will pursue a tie-in promotional model to harness their networks to our advantage through joint promotional campaigns.

2.2.1.3 Dissemination Plan

The general dissemination of **PoliVisu** results will differ in intensity based on the evolution of the project. The dissemination activities will be carried out in three main phases, spanning throughout the project duration and extend beyond it, with increasing level of intensity, starting from the creation of general awareness and concluding with attracting through workshops potential supporters and adopters of the project results. The three phases are presented as follows:

Phase I covers the first 12 months of the project duration. The main purpose of this phase is to create general awareness about project objectives and expected results. The first task will be the creation of the project brand through an attractive and compelling logo and clear messaging. The brand will then be used across a range of communication tools and materials including the project website, main social media channels (Twitter, LinkedIn and Facebook), presentations and flyers which should be able to be understood by any layperson across Europe. By month 3 of the project all general dissemination materials should be in place. The project will be presented to a broad audience through a range of social media messaging and presentation at European and national conferences and workshops with streams related to policy making and GI data use. The partners in **PoliVisu** were chosen not just for their expertise, but also for their geographic coverage of Europe: Western (France, UK), Southern (Italy, Greece), Central (Belgium) and Eastern (Czech Republic) ensuring dissemination activities are spread widely. In addition, partner Plan4All provides its own network of members across Europe.

Phase II will be executed during the second year of the project (months 13-24). The dissemination activities during this phase will aim at attracting potential users & early adopters for the **PoliVisu** Playbox. The main output to be disseminated will consist of the project's concrete results and success stories. The project results will be disseminated via more focused dissemination activities, including press-releases, social media postings, presentations, workshops, training, publications and participation in relevant conferences, exhibitions and videos.

Phase III will be during the last year of the project when the main focus will be to leverage the exploitation of the **PoliVisu** outcomes promoting the benefits of using the Playbox to appropriate public and professional media channels. The aforementioned are summarised in the following table:

Phase	Month	Type of Info	Broad Audience	Key Channels
Phase I	1-12	Approach-oriented content; project presentation; objectives; expected results.	• Standards bodies • Government policy makers • Research Institutions	Project Website & SM, Leaflet & Brochures, Publications/presentations at Conferences and Workshops
Phase II	13-24	Result-oriented content; project intermediate and final results	• Standards bodies • Government policy makers • Research Institutions	Project Website & SM, Workshops, Focused publications, Conferences, press releases; promotional videos;

Phase III	24+	Result-oriented content; project final results; Proven PaaS platform, pilot showcases and lessons learnt.	• Standards bodies • Government policy makers • Research Institutions • Investors	Project Website & SM, Conferences, Targeted Policy Workshops, Focused publication, Partners leaflets, press releases and promotional videos; Publicity through TV & radio

The **PoliVisu** Consortium is also planning to organize workshops in each pilot region targeted to the policy teams who can benefit from the **PoliVisu** solution as well as additional organisations (who can provide support and influence). It should be worth noting that whilst citizens have not been considered as a direct audience segment for dissemination, they are a direct target for communication activities (detailed at end of this chapter) and all material will be accessible to anyone who has an interest in data driven policy making.

Dissemination Activities Focus: All project partners will perform dissemination activities, but they will differ according to partner type and area of specialisation. The technical partners will approach their networks in order to raise industry level awareness about the ability of **PoliVisu**'s services, while the business and SME partners will focus on disseminating the project results towards city policy makers to encourage take-up and adoption of the **PoliVisu Playbox**, at the same time research partners will target research institutes and universities across the enlarged Europe aiming to showcase **PoliVisu**'s research results for influencing and informing further studies in this area.

2.2.1.4 Knowledge Management and IPR

Whilst the **PoliVisu** Consortium are working to principles of Open Government, Open Access and Open Innovation, choosing technical components that are Open Source to ensure project results are freely available to all, the consortium also recognises that formal management of knowledge and intellectual property rights (IPR) is fundamental for the effective cooperation within the project lifetime and the successful exploitation of the **PoliVisu Framework** and tools within and after the end of the project. Through knowledge management and the protection of partners' individual interests, we will avoid information bottlenecks related to confidentiality or competitiveness among the Consortium members, thus the chances for the market visibility and the exploitation potential of project results are maximised. Management of knowledge and IPR issues will be carefully integrated within the framework of the Consortium Agreement (CA), drawn to be aligned with the policies and context for EC funded projects under the ICT programme of the Horizon 2020. The Consortium agreement will specify how and under which terms and conditions partners access existing knowledge or knowledge generated by other parties. It will also elaborate on the terms and conditions of access to such IP in the case of exploitation beyond the scope and duration of the project. The Consortium Agreement will carefully identify the Foreground and Background Knowledge and will address: confidentiality, i.e. issues related to the disclosure of confidential information in accordance to applicable laws and EU regulations; ownership of knowledge; legal protection of results; access rights to Foreground and Background; obligation for use specifying the responsibilities of the partners to meet the EC Model Contract; dissemination of knowledge according to regulations governing IPR and reflecting the EC Model Contract. The enforcement of the agreement is a task of the management structural organisation. This is not obligated to start a legal process. This is in the responsibility of the involved partners.

2.2.1.5 Standardisation Activities

Policy Making: In addition to working with International research initiatives (identified in chapter 1.3.1.7 such as the Policy Lab who are gather ideas, research outcomes and new methodologies on how to use data for decision making) **PoliVisu** will also consider how to input into IEC and ISO International Standards for policy making. These International Standards developed by the IEC and ISO are voluntary. And while they do not seek to establish, drive or motivate public policy, regulations, or social or political agendas, they do provide valuable support to the implementation of public policy. **PoliVisu** envisions embedding the ISO principles in its framework, submitting the results as a reference case for other policy makers, as well as getting directly involved in the International Standards development process, potentially suggesting a new working group to explore data-driven policy making.

ICT Standardisation: The Open Geospatial Consortium (OGC) provides a key expert to the **PoliVisu** expert panel. During a previous GI project, **PoliVisu**'s Coordinator AIV, organised the creation of a new OGC DCAT Geospatial working group to focus on best practices in the field of cross-domain metadata standards. **PoliVisu** will continue to deliver value to that group by describing how metadata about live (big) datasets and sensor data can be added to the existing DCAT standard by formulating and testing specific extensions. The advantage of such an extension is that every dataset use the same basic and easy to understand information, and that extra valuable and more accurate information can be added in a standardised way. This approach is in line with the W3C, OGC and JRC approach on DCAT and GEO-DCAT (AP). Whilst seeming very technical, this standard work helps to advance the field of big data use, making it ever easier for cities to used data in an interoperable manner. **PoliVisu** will also add additional value by contributing to other OGC initiatives on sensor data like the SWE standard (Sensor Web Enablement) and SOS (Sensor Observation Service) standard by using the appropriate sensor standards and communicating our findings to the OGC and ITS community.

2.2.1.6 Management of Research Data

Management of the research data generated and/or collected during the project will be carried out following a Data Management Plan that will be included in the overall Project Management Plan. This will include guidelines for collecting, storing, handling and making accessible the data produced during the research and validation work streams. The plan will be constantly updated to fine-tune it to the data generated and the uses identified by the consortium during the research.

PoliVisu will follow the Open Access mandate for its publications and will participate in the Open Research Data pilot, so publications must be published in Open Access (free online access). Following the list of deliverables, the consortium will determine the appropriate digital objects that will apply to the Data Management Plan. Each digital object, including associated metadata, will be deposited in the institutional repository of Universitat Politècnico Milano, whose objective is to offer Internet access for university's scientific, academic and corporate university in order to increase their visibility and make it accessible and preservable. This reflects the commitment of the University within the framework of the Initiative for the Budapest Open Access, with the movement of open access to knowledge gained from joining the Berlin Declaration and Institutional Policy on Open Access. In addition, Polimi will arrange an Ethical Protocol with the ethical rules and procedures to be followed by all the researchers in the project. The Data Management Plan and Ethical Protocol will include precise indications for fulfilling the following tasks:

- How to ensure the privacy of all research participants; how to manage, store and destroy sensitive data; how to anonymise data which will be made public and openly accessible;
- How to ensure a constant quality control for the collected data;
- How to use the data collected and/or produced during the project, respecting the privacy of all research participants, the intellectual property and the exploitation in further research of the collected findings.

The data collection and storage will be defined by Polimi in order to guarantee the quality of data and its correct use during the evaluation. A special effort will be made to collect as little restricted and personal data as possible. The collection, storage, management and evaluation of the data will be mainly oriented to evaluate the service. All the personal data added to the central database will be anonymised.

Furthermore, all this data will be handled only by qualified researchers under strict confidentiality agreements, who will ensure that data access, data protection and privacy standards are in compliance with national and European regulations. All the users included in the different trials will sign an informed consent in which they will be duly informed about how their personal data will be treated. Should any sensitive data be obtained during the project, the project will see to it that it be made anonymous and rigorously protected for the duration of the action and destroyed at the conclusion. When processing personal data, the consortium will comply with the Data Protection principles which are set out in the Directive 95/46/EC and its revision (European Parliament legislative resolution of 12 March 2014 on the proposal for a regulation of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation).

2.2.1.7 Communication Activities

In addition to a general dissemination approach, more focused communication activities for specific audiences will be framed around two central objectives: (1) development of incentives to help engage specific stakeholders (relevant to the mobility challenge being explored) in the pilot sites to participate in the experimentation (development and testing) of new policies, (2) create the **PoliVisu Business Case** based upon the research and pilot results and use to market the **PoliVisu Playbox** and **free training** solution to attract new users/adopters. At the outset of the project, **PoliVisu** will elaborate upon these objectives to create a communication approach that will include the following **tasks**:

- Build on the project brand and identity to create communication messages for targeted audiences
- Generate positive media coverage for the project at local, national, European and international level
- Communicate project results and achievements to specific stakeholder groups at targeted local events
- Contribute to and help sustain active communities of interest around data-driven policy making
- Develop a tailored methodology to monitor and measure the impact of the communication strategy

PoliVisu will address the following **target groups**: (a) **Governance:** Policymakers who have an interest in improving policy impact using data (b) **Stakeholders:** Communities, organisations and individuals who will co-create policy with the policymakers, and (c) **Influencers:** Media**,** standards bodies & research institutions who are interested in **PoliVisu** results

PoliVisu will achieve the above objectives by using a multi-platform, multi-channel communication strategy to carry out diverse and novel activities in order to create compelling content and events that live-up to the scope of the project and the challenging environment of data driven decision making. Key elements include:

Enhanced Multi-Media Website
Create a general dissemination website with additional pages and material for specific audience groups. Update it with results and achievements, including the interactive **PoliVisu** Playbox, during the entire project period. Complement information with interwoven tools such as social media, newsletters, RSS feeds, project results as well as presentations and other audience videos and specific publications. **Audience:** Policy makers, Researchers, Stakeholders, Standards Bodies, Media, General Public **KPIs:** Quantified and qualified web traffic analysis, trackbacks, mentions
Specialised Social Media
In addition to managing main social media channels (Twitter, LinkedIn and Facebook) **PoliVisu** will set up and maintain other more specialised social media channels for specific audiences (Google Scholar, Tumblr, Listgeeks, Xing etc.) and will connect to and influence ongoing conversations in particular areas of big data, linked data, open data, geospatial data and policy discussions related to transport and mobility. Where possible the social channel will be linked with the project website via social media share buttons. **Audience:** Policy makers, Researchers, Stakeholders, Standards Bodies, Media, Public **KPIs:** Quantified and qualified social media analysis, number of re-tweets/shares, mentions, listings
Targeted Conferences/Workshops
Includes events created by the consortium streamlined towards the various mobility policy areas in **PoliVisu** as well as a wide range of fairs, conferences and workshops within the academic, industry and standards world e.g. Global Forum, NetFutures, DataCloud Europe, Data for Policy Making, Integrated Transport Symposium etc. **Audience:** Policy makers, Industry players, Researchers, Standards Bodies **KPIs:** Number of presentations given and papers/workshop/poster proposals accepted, attendees
Policy Data Jams
PoliVisu may organise Data Jams within the pilot locations to showcase the use of the **PoliVisu** tools and provide a supportive co-creative space for the first hands-on experimentation of specific policy challenges. The Jams will enable the novel creation of practical solutions concerning on these challenges. The results of these events will be used to further promote **PoliVisu** across traditional and new media. **Audience:** Policy makers, Stakeholders, Media, **KPIs:** Number of attendees/platform sign-ups, evaluation of concepts, policy scenarios created,

Paper Publications
With regards to the academic community the respective **PoliVisu** research partners (Polimi, 21c) intend to disseminate the results of the project via the publication of articles and submission of technical papers in specialized press (e.g. Journal of Policy Making) magazines and/or newspapers also on-line (e.g. TechCrunch, EurActiv), audio or video media, at international, European, national, regional or local level in order to reach the widest audience possible. Additionally, these papers will be further promoted via **PoliVisu**'s regularly updated newsletter **Audience:** Policy makers, Researchers, Standards Bodies, Media **KPIs:** Number of papers, publication types, countries covered, audience reach
Clustering
Sharing lessons learned and even resources with other related projects and initiatives in the ICT/Data Policy Making world will ensure **PoliVisu** doesn't reinvent the wheel but rather it builds upon the results of others in the field. Clusters will include cross-project activities with other EU funded initiatives such as Open4Cities, WeLive and Smarticipate; as well as networking with European associations and networks such as EuroCities (Gent is president), LOLA, VICTOR, FutureCities catapults, etc. These clusters will be useful in creating **PoliVisu**'s final dissemination event, which will be held in conjunction with a major community event (Policy Making, Mobility, Smart Cities, Horizon2020 related) to showcase the Playbox, **Audience**: European Projects, Policy Networks, Mobility Networks, Standards Bodies, Researchers **KPIs:** Number of networks/projects, lessons shared, meetings/events, impact on **PoliVisu**
Audio Visuals
The production of a professional animated **PoliVisu** video for informing and engaging users will be placed on the website and used at conference exhibitions, training workshops and event presentations and the like. The core aim of the video is to explain the somewhat complex undertakings to the widest possible audience. This professional video will be supplemented with short Vox pops and consortium made films to support more specific exploitation opportunities. Audience: Policy makers, Researchers, Stakeholders, Standards Bodies, Media, Public KPIs: No. of views, number of shares, mentions, listings

As with the general dissemination approach, more specialized communication outreach will be carried out by individual partners to the audiences they identify with and have access to. This approach is intended to build on established trusted relationships to significantly increase the chances of encouraging the adoption of **PoliVisu** solution by end users.

3. Implementation

3.1 Work plan

The work plan for **PoliVisu** is broken down into logical tranches using the Work Breakdown Structure (WBS) approach. The diagram below highlights how the interconnected and dependent work packages work together.

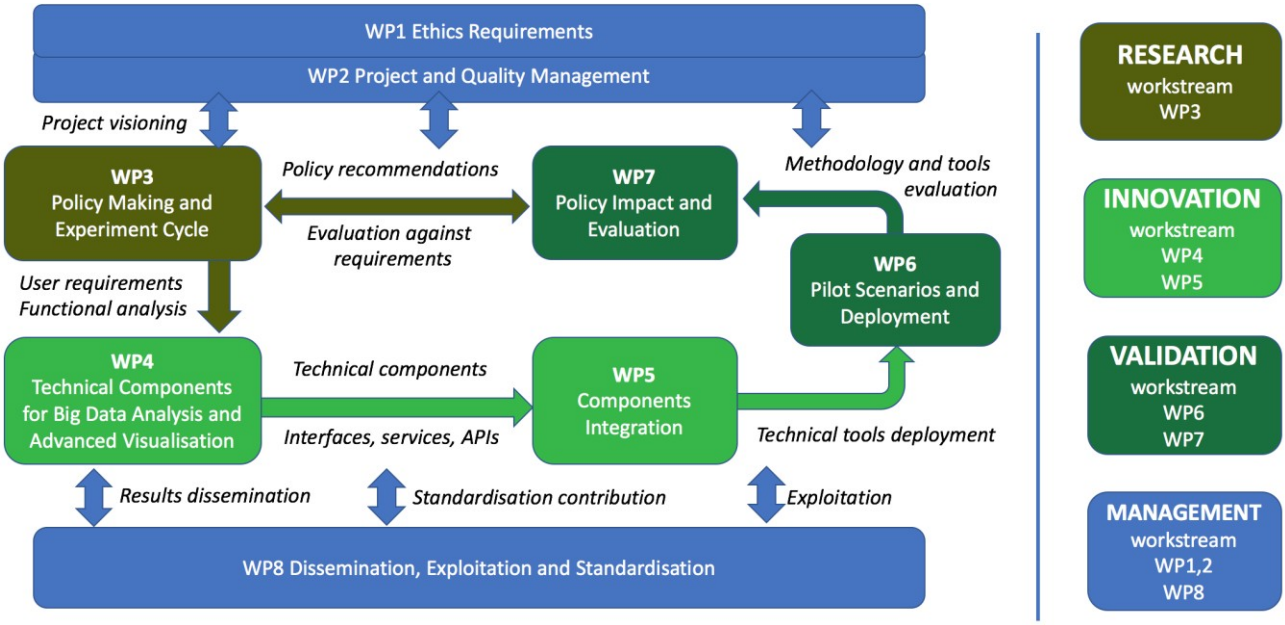
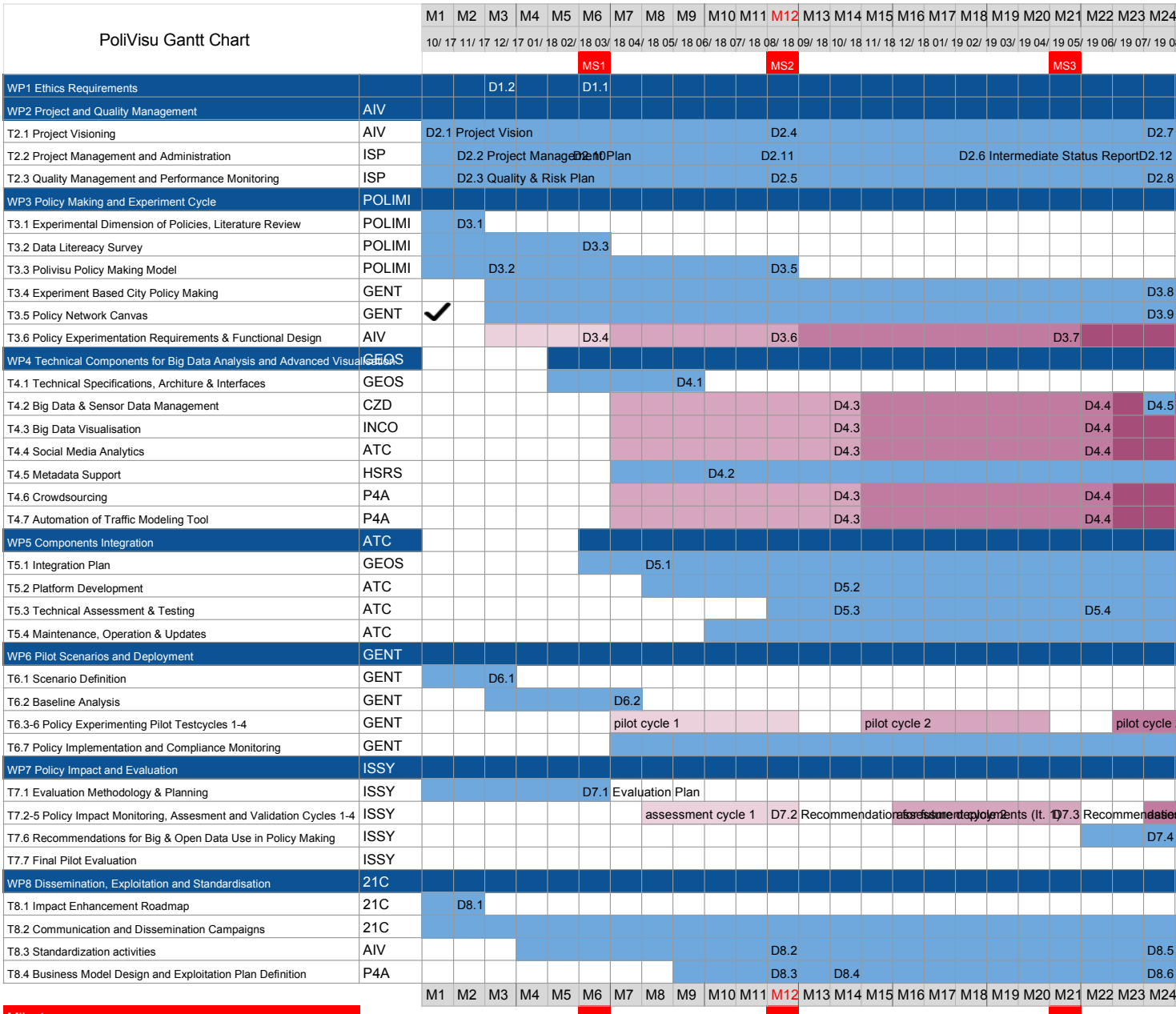


Figure 8: Workstreams, Work Packages and Their Interdependencies

WP1	**Ethics Requirements** ensures compliance with the 'ethics requirements' that the project must comply with.
WP2	**Project and Quality Management** an 'umbrella' work package defining the project vision, quality procedures and management actions for resource-efficient and timely management of **PoliVisu**. WP2 will produce regular financial and operation reports on the project progress.
WP3	**Policy Making and Experiment Cycle** undertakes research to explore the experimental dimensions of policy making to develop a policy making model based on the sequence of policy experiment cycles. User requirements from policy makers will also be gathered in WP3 , followed by a detailed functional analysis for technical WP4-4.
WP4	**Technical Components for Big Data Analysis and Advanced Visualisation** will undertake research on the state-of-the-art methods and techniques for big data use in policy-making processes. It will extend, enhance and adapt the technical components to be integrated in WP5 for use in policy making, and design and develop the necessary interfaces (services, API's) and standards to make the technical components open, reusable and interoperable.
WP5	**Components Integration** will oversee the establishment, integration and management of the **PoliVisu** tools throughout the project. The purpose is to create a fully functioning technical infrastructure with a user-friendly interface that will provide visualisation layers and APIs to allow policy makers to understand and use the data. WP5 will make this possible by integrating components delivered by WP4.
WP6	**Pilot Scenarios and Deployment** deploys, tests and validates the **PoliVisu** tools through real-life proof-of-concepts in three different cities (Plzen, Gent and Issy-les-Moulineaux). WP6 will test-run the **PoliVisu** policy methodologies and an easy-configurable technical component (delivered in WP4 and WP5), thus enabling data-driven policy making based on big data analyses and visualisations.
WP7	**Policy Impact and Evaluation** monitors, evaluates, and validates the **PoliVisu** tools deployed in pilots. This WP will collect all the best practices and produce hands-on recommendations for the effective use of big & open data in policy making.
WP8	**Dissemination, Exploitation and Standardisation**, builds on the results of previous WPs, deplosy outreach strategies to ensure general awareness raising of **PoliVisu** and targeting its results to specific stakeholders, will deploy standardisation activities as an additional mechanism for exploitation and dissemination of project results, and will refine the **PoliVisu** Playbox and define business oriented exploitation approaches.

3.1.1 Gantt Chart



3.2 Management Structure and Procedures

PoliVisu is a complex cross-border project with the key objective to deliver rapid policy innovation in cities and related sectors, as well as to encourage fast adoption of **PoliVisu** solutions across Europe. The consortium will use a strict project management methodology to ensure the successful delivery of outputs and outcomes as well as the protection and effective utilisation of the knowledge that is generated. Hence, **PoliVisu** has incorporated qualified programme and project managers within its team and will use an agile process management to ensure the possibility of adaptive life cycles (i.e., iterative and incremental life cycles) that range up to six months. At the same time, this process management will facilitate that all partners understand each other's roles and responsibilities, as well as their own actions and deadlines.

3.2.1. Organisational Structure

The organisational structure of **PoliVisu** incorporates traditional project management workflows and roles. The diagram below illustrates the proposed framework for the roles within the project. This structure will be finalised with the signing of the Consortium Agreement by all partners. Besides this, although key partners have been identified for each role, the complete structure will be finalised and implemented within the Project Management Handbook and the Quality Plan, which will be delivered in the early months of the project.

The key roles within **PoliVisu** project are as follows:

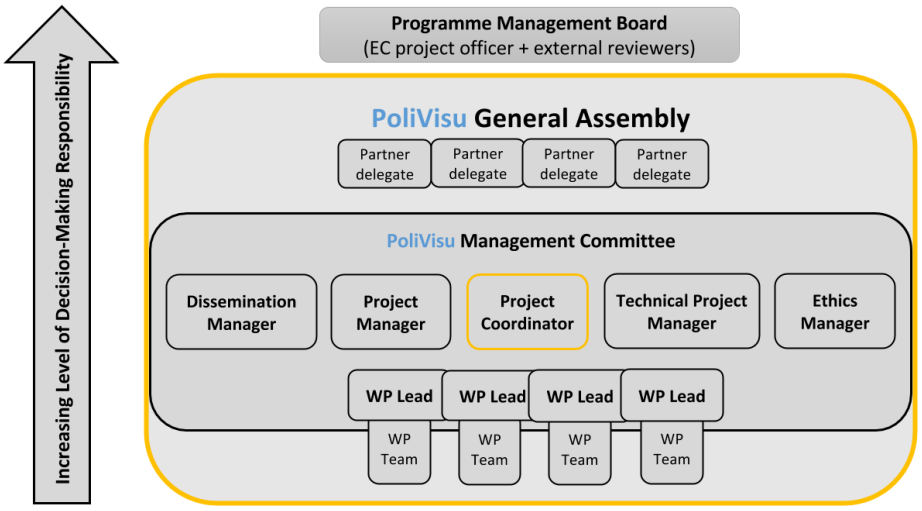


Figure 9: Organisational Framework for PoliVisu

Programme Management Board: Composed of the European Commission's Project Officers supported the external reviewers, the Programme Management Board gives the go-ahead for the project to proceed, sets the tolerances for the project, and receives all the outputs and results.

General Assembly:
The General Assembly (GA) is the ultimate decision-making body of the consortium. The GA consists of official delegates assigned by the project partners, and will be chaired by the project coordinator. The management representatives will have the authority to make decisions on behalf of their respective organizations in terms of overall project strategy, proposals for changes to Description of Action, resources allocated to the project, and any other contractual and financial matters. The GA will vote on all important decisions related to the contractual execution such as changes to the consortium configuration, reallocation of responsibilities and effort among partners, settlement of disputes, or differences between partners. If necessary, the GA can create ad-hoc Task Forces, composed of experts, chosen from the project participants, that will work together to solve well-defined problems in a limited period.
A face-to-face GA meeting will be organised once a year. Conference call might be organised on ad hoc basis. The GA's role, responsibilities, rules, and decision-making procedures are detailed in the Consortium Agreement (CA).

Management Committee: The project will be supervised and managed by the Management Committee (MC), composed of the Coordinator, all WP leaders, project manager, technical project manager, dissemination and communications manager, and ethics manager. The **PoliVisu** Management Committee will be chaired by the Coordinator (AIV) with the support of the Project Manager (ISP). The regular monthly Management Committee conference calls will be organised in order to coordinate the day-to-day work of the project. These monthly calls are open to participate for representatives from each partner.
The Management Committee has the following responsibilities:

- Implementation of the directives of the GA;

- Effective and efficient implementation of the project;
- Guidance and monitoring of the WPs, the coordination among WPs, and the resolution of conflicts among WPs;
- Approval of all project plans including the communication, exploitation, and business ones;
- Review of all deliverables and assurance of their timely delivery as well as approval to progress to the project's next stage;
- Ownership of identified risks and approval of all changes to the project; and,
- All decisions on recommendations for follow-up actions to be passed on to the GA and the Programme Management Board.

Coordinator: The Coordinator (AIV, represented by Geert Mareels) is ultimately responsible for the execution and strategic management of the project. The Coordinator will implement the agreed strategy, oversee the choice of techniques, and supervise the monitoring of the results, and co-ordinate the quality assurance function. The Coordinator will also implement the decisions taken by the Management Committee and be responsible for taking any short-term decisions between Management Committee meetings, seeking its approval if necessary. Responsibilities include:

- Ensure coherent organisational structure and drafting of deliverables following due approval procedures;
- Monitor and control project progress at a strategic level;
- Ensure risks are being tracked and mitigated as effectively and early as possible;
- Organise and chair project meetings;
- Approve deliverables before sending them to the Programme Management Board;
- Responsible for project assurance;
- Conduct quality tests on all deliverables and outputs; and,
- Be in general the key decision maker with advice from others.

The Coordinator is not delegating any of the tasks listed in art 41.2 of the GA to the Project Manager, these tasks being:
(i) monitor that the action is implemented properly;
(ii) act as the intermediary for all communications between the beneficiaries and the [Commission][Agency] (in particular, providing the [Commission][Agency] with the information described in Article 17), unless the Agreement specifies otherwise;
(iii) request and review any documents or information required by the [Commission][Agency] and verify their completeness and correctness before passing them on to the [Commission][Agency];
(iv) submit the deliverables and reports to the [Commission][Agency] (see Articles 19 and 20);
(v) ensure that all payments are made to the other beneficiaries without unjustified delay (see Article 21);
(vi) inform the [Commission][Agency] of the amounts paid to each beneficiary, when required under the Agreement (see Articles 44 and 50) or requested by the [Commission][Agency].

Project Manager: The Project Manager (ISP) will be responsible for day-to-day operations of the project and the pilots. The Project Manager will be the main link between the Coordinator, WP Leads and the Partner Leads. Specific responsibilities include:

- Closely monitor progress on the demonstrator sites;
- Manage the production of deliverables within timely restraints;
- Direct and motivate the project team;
- Plan and monitor the project whilst managing risks;
- Liaise with the Management Committee; and
- Be responsible for change control and any required configuration management.

Technical Project Manager: The Technical Project Manager (Geosparc) is responsible for removing impediments for the team to deliver products, goals and deliverables. The role acts as a buffer between the development team and the dangerous distraction of simply ticking project plan box. Specific responsibilities include:

- Chairs key technical team meetings;
- Challenges team to improve; and
- Ensures the delivered product meets needs.

Dissemination and Communications Manager: To ensure that the project results are disseminated and communicated as effectively as possible, a DCM (Dissemination and Communications Manager) is appointed. The DCM's task is to manage and coordinate the dissemination activities within different WPs. **PoliVisu** has chosen this approach so that communication takes place in the WPs immediately by the people who do the scientific work. At the beginning of the action, the DCM will create a Dissemination Plan in collaboration with all beneficiaries to identify different audiences and means to dissemination activities. In order to ensure the highest working efficiency and avoid overlaps in partners' responsibilities, DCM will be performed by the WP8 leader (21C Consultancy).

Ethics Manager: The Ethics Manager is responsible to follow up that the project implementation is in accordance with the rules and principles described in Sections 4.4. and 4.5. (Ethics and Security) of this Description of Action. If the Ethics Manager observes potential ethical issues, he will inform the Coordinator about those issues so that they can be addressed, in a timely manner, by the project management. The Ethics Manager will report on ethical issues in periodic reports according to the project's reporting plan. As will be discussed in Section 4.4, the "ethics manager" nominated by the consortium is Geert Mareels.

Work package Leads: The WP Leaders prime responsibility is to ensure production of those products defined by the Project Manager to an appropriate quality, in a time scale and cost acceptable to the Management Committee. The WP Leaders report to and takes direction from the Management Committee to:

- Direct, motivate, plan and monitor the team work;
- Advise the Project Manager of any deviations to the plan;
- Ensure all project issues are properly reported; and
- Ensure quality controls of the working teams are performed and planned correctly.

3.2.3. Management procedures

3.2.3.1 Change Management

Change management is the process for requesting, reviewing, approving, carrying out and controlling changes to project deliverables. At the start of the project in the Project Management Handbook, the Consortium will agree a well-defined process for change control based upon that will detail responsibilities, tolerances for change at different project levels, and tools to be used to manage the change process. In keeping with this, any participant in the project may raise a Request for Change (RFC). The Project Manager and Coordinator will ensure they are captured and are proactively managed to conclusion. An initial review should be made to examine the need for the change, how it could be achieved and what the consequences would be. The most appropriate member of the Consortium would normally perform this review. Based on those conclusions, the recommended action would be proposed which would be one of three possible courses: (1) Minor changes within scope can be approved by the Project Manager. (2) Any change affecting the deadline of a deliverable or outcome would need to be reviewed by the Coordinator and shared with the Management Committee which would agree the necessary revisions to get the project back on course. (3) Changes of scope and contract revisions would require the approval of the European Commission. The diagram below highlights **PoliVisu** approach to change control.

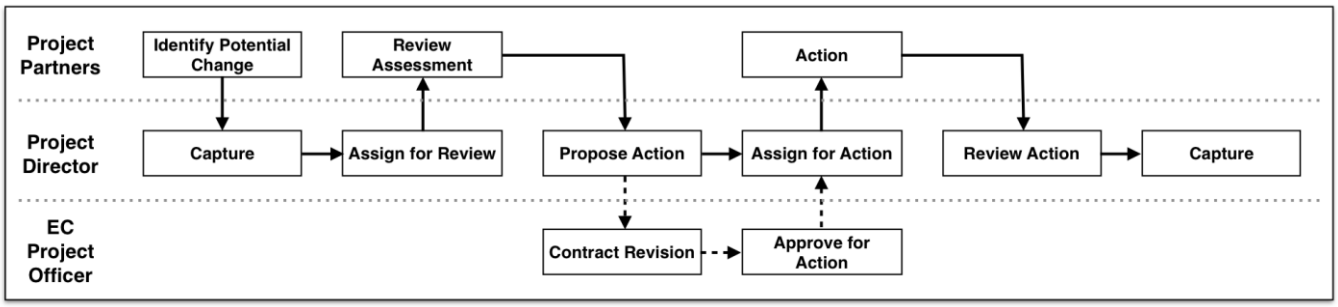


Figure 10: **PoliVisu** Change Management Procedure

3.2.3.2 Quality Control and Management

Quality control. Before the project begins, the Consortium members will sign a formal Consortium Agreement in which roles, responsibilities and mutual obligations will be defined. The Consortium Agreement will include:

Internal organisation of the Consortium, its governance structure, decision making processes, reporting mechanisms, controls, penalties and management arrangements. Mitigation processes and provisions for the settlement of Partnership disputes. Specific arrangements concerning ownership and intellectual property rights to be applied among participants. Management of knowledge generated by the project and rules for knowledge transfer. Rules for Partners joining and leaving the Consortium.

Quality management. On the other hand, quality management will be carried out to ensure that the quality expected by the EC is achieved. Progress of the work within the project will be monitored against the milestones and the defined objectives and performance indicators. These criteria, based on the EC's expectations for the project, will be defined at the beginning of the project to ensure that all work is carried out in reference to them. To help ensure the project meets its objectives, all the quality procedures to be implemented during the project life cycle will be formalised in the Project Management Handbook and Quality Plan issued at the start of the project in WP2. The plan will define the techniques and standards to be used in the project. These techniques and standards will include a set of rules for the organisation of the day-to-day work, the procedures and reporting mechanisms to be used, the organisation of meetings and the preparation of Deliverable documentation for submission to the EC.

The Coordinator (AIV) will coordinate the Project and Quality Assurance role for **PoliVisu**. The specific responsibilities of this role will be defined in the Quality Assurance Plan, but the main role will be to review and approve plans created for each stage of the project, and ensuring that quality checking arrangements for the deliverables in these plans are satisfactory.

In addition, the Project Manager (ISP, with extensive experience in project and quality management) will perform a Quality Control role for the project. This will involve a structured internal peer-review of each deliverable produced in a planned, documented and organised fashion. Once the deliverable has been reviewed, the Project Manager will either give 'sign off' to the deliverable to assert that it has passed the quality review and is able to be sent to the EC, or they will assert that the deliverable is not 'fit for purpose'. In this circumstance, the deliverable will be sent back with comments to its producer. If the producer is unable to resolve the problems, this will be taken to Management Committee to decide on the appropriate action.

Document Quality Management. By using conferences, meetings and mailing lists, the project partners will be regularly informed about the project status, planning and any other issue relevant for the partners in order to obtain maximum transparency and awareness. Documents shall be transmitted and published via the web page, where appropriate. In addition, direct transmission of information to the partners will be used. A template for the deliverables will be elaborated so that all the project deliverables comply with the same form and structure.

3.2.3.3 Communication Flows

The main vehicle for information exchange within the project will be through an online project management software customised to the needs of H2020 European projects. Hence, the **PoliVisu** consortium will have access to the information (e.g. working papers, deliverables, minutes, calendar, timelines, etc.) provided by the platform. Moreover, the platform allow the use of email, which is the preferred means for communication and information exchange between the partners. The tools, file formats and configuration management used for project communication will be agreed upon at the start of the project.

3.2.3.2 Critical Risk Management

A detailed risk management plan will be created at the start of the project (as a part of the Quality Plan - deliverable D1.2) to clearly define how the **PoliVisu** consortium will identify and manage risks throughout the life of the project. This plan will include the creation of a risk log including an account of actions to mitigate these risks. The risk exposure will be assessed for each of the identified risks, being derived from two variables: impact and probability, as the following table illustrates:

	PROBABILITY		
IMPACT	*Likely*	*Moderate*	*Unlikely*
Severe	**HIGH**	**HIGH**	MODERATE
Moderate	HIGH	MODERATE	LOW
Minor	MODERATE	LOW	LOW

Figure 11: Risk Measurement Approach

The process to be used is a simple step-by-step check-list summarised as follows:

(1) Identify risks. A risk log will be created whereby the Project Manager will identify risks, in close collaboration with WP leaders. The methodology used to identify the risks will be carried out by a "what-if" analysis. (2) Evaluate probability. (3) Evaluate impact. (4) Document the two variables and devise an action plan to mitigate the risks in advance and take proactive actions. (5) Manage actions. (6) Evaluate results.

As stated above, specific risk mitigation strategies will be put in place and acted upon to reduce the probability of occurrence or impact of a risk. The Project Manager will review each risk (based upon the risk's impact and its likelihood) and define a mitigation and/or contingency plan that is aimed at preventing the risk from materialising or taking corrective action if the former fails. The mitigation plan will include the preventive actions to be performed, responsibilities to be assigned, and tentative dates by which the plan will be implemented. A contingency plan will also be defined to counter any risks that eventually materialise further on down the road.

Risk Monitoring. A mitigation plan for all identified risks will be defined and closely monitored by the project management team. Issue resolution and escalation will be defined for the project as per this mechanism. Risk will be analysed at project and/or engagement level. Once a risk is identified, it will be tracked and monitored during the project in order to minimise its potential damage. This will be done via status reports and periodic management reviews of the project. A risk log outlining potential issues and contingency actions will be created at the start of the project. An initial list of key project risks for each WP has been identified.

3.3 Consortium as a whole

PoliVisu unites leading experts from across Europe, from the fields of open innovation, open government and policy making (POLMI, AIV, 21c), GI data specialists (HSRS, Plan4All, Cityzen Dara), Social medial data managers (ATC), Data modelling and visualisation experts (Gesosparc, InnoConnect, EDIP), Transport data specialist (Macq), Mobility policy makers and data holders (Issy, Ghent, Plzen) project management (ISP) to create a powerful new consortium that combines fresh thinking with entrepreneurial innovation and drive The consortium consists of a balanced mix of Policy, Geospatial Information, Open Data, Open Innovation and Smart Mobility expertise:

Coordination and Project Management Expertise:
PoliVisu will be led by the Flemish Information Society – AIV (formerly known as CORVE – Flemish eGovernment Authority). AIV will drive the overall research and innovation effort and ensure rigorous standards of quality are enforced throughout. AIV has an extensive track record as a pioneer in the delivery of innovative Open Data services through coordination of the flagship CIP project Citadel on the Move and transport data visualisation project OpenTransportNet. AIV will be supported in day-to-day project management by IS-Practice. a dedicated project management practice with a long history of delivering high-quality, high-impact projects for the

Open Policy Research Expertise:
Politecnico di Milano and its research unit – Design Policy Lab – have been working on policy design since 2000. They work with universities across Europe to add value to policy process through design and have coordinated the flagship DeEP Design in European Policy research project focusing on co-created policy and implementation in Living Lab settings. Polimi will lead all the research activities in **PoliVisu** supported by 21c, a boutique SME that specialises in the design and delivery of Open Innovation projects for public and private sector. 21c have participated in several policy research projects at the EU level including PuzzledbyPolicy, ASK and WAVE. The open policy work of **PoliVisu** will also be

Policy Expert Panel:

PoliVisu has appointed an external panel of eminent policy experts (who have signed a letter of acceptance) who will help guide the steering of the project and provide a critical friend role in terms of methodology and outputs. The panel will be chaired by AIV and consists of:

- **eParticipation Expert:** Prof. Dr. Maria Wimmer (Universität Koblenz - Landau)
- **Living Labs Expert:** Mr. Pieter Ballon (Director of research group SMIT - imec-smit-vub)
- **Policy Modelling Expert:** Professor Yannis Charalabidis (University of Aegean)
- **Policy and Tech Expert:** Mr. Andrew Stott (former UK Government CIO)
- **Geospatial Standards Expert:** Bart De Lathouwer (OGC - Open Geospatial Consortium)
- **Local Government Policy Expert:** Eddy van der Stock (President Linked Organisation of Local Authorities - LOLA npo - and President Vlaamse ICT Organisatie - V-ICT-OR vzw)

Mobility, Open Data and Piloting Expertise:

The city of Ghent an innovative administration will oversee all the pilots. Ghent will run a pilot focused on policy around student mobility. Strategically located on the border of Paris and the Seine river, CIP-veteran ISSY closely connected to Issy-les-Moulineaux will run a pilot focused on developing policy to managing congestion. In the Czech Republic, Plzen will run a pilot focused on roadworks and traffic flows. Each pilot has access to a range of open data sets related to mobility that will be used within the project.

GI Data and GIS Technical Expertise:

Geosparc is the technical leader for the project managing the overall architecture structure to deliver web components for advanced visualisation, analysis and user interaction as GIS expert. EDIP, the traffic engineers specialising in traffic volumes maintenance, will provide access to database of accidents on the road network of the Czech Republic. They will assess traffic accidents in terms of their spatial location, identification of the causes of accidents and their consequences by using GIS system. HSRS, a seasoned GIS expert, will focus on standardisation and implementation of Metadata and tools for crowdsourcing. InnoConnect will be responsible for the development of a web-based tool for big data interactive analysis and visualisation, extending further the WebGLayer open source library.

Big Data, Sensor Data, Social Data Expertise:

Cityzen Data (awarded 'start-up of the year 2016') will provide the methodology and tools to facilitate rapid transfer, filtering and storage of sensor data. Macq as smart city solution provider will contribute to the collection of high quality big data with traffic road sensors and help the management of traffic centres and traffic infrastructure. ATC will provide its award winning TruthNest solution to harness intelligence from social media data.

Communication and Business Modelling Expertise:

Wearing a dual hat, 21c, a pioneer in the use of media and information technologies, will oversee all aspects of stakeholder engagement and communication to create a solid foundation for future exploitation. 21c is a highly-experienced provider of professional communication and marketing campaigns for a wide variety of European projects and public sector initiatives. Also, wearing a dual hat, ISP will utilise its considerable experience in commercialising the outputs of research projects to help guide **PoliVisu** to a sustainable future. The **PoliVisu** expert panel will support the team in reaching out to specialist networks in the GI and Open Policy fields. Plan4all, a non-profit network association, will secure through its members the collection of user requirements and needs of citizens, businesses and public authorities in terms of business,

This combination of unique experience guarantees the quality and efficiency of implementation of **PoliVisu**. The following table presents a high level of the partner skill matrix, considering the expertise areas of each partner. With this carefully composed consortium, we believe to be able to fully accomplish **PoliVisu** objectives, while finding equilibrium between visionary research, EU expectations, applied innovation, industrial relevance, and the creation of smarter policy decisions.

Fields of Expertise	EVIV	ISP	EDIP	ISSY	HSRS	GEOS	INCO	CZD	21C	ATC	SITMP	MACQ	P4A	POLIMI	GENT
Policy development methodology	■			■		■			■		■			■	■
Living Lab methodology				■										■	■
Big data management			■				■	■		■		■			
Geographic Information Systems					■	■	■				■		■		
Sensor data and real-time data					■	■		■			■	■			
Big data analytics and visualisation			■		■	■	■	■		■					
Social media analysis										■					
Crowdsourcing				■	■	■					■				■
Security and privacy	■					■									
Dissemination and communications	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Market analysis	■								■						
Business strategy and modelling		■				■			■						
Project, risk and quality management	■	■				■								■	

Figure 12: **PoliVisu** Consortium Skills Matrix

3.4 Resources to be committed

3.4.1 Person Months

The table, and pie chart (right), show a fair and balanced distribution of man months across the key elements of the project. Research and Validation (WP3, WP6 and WP7) has the largest share of effort as to be expected. This encompasses all the work around research, policy requirements, piloting the solution and validating the results. The second largest segment is Innovation (WP4 and WP5) which covers all the technical adaptation and integration work to create beyond the state-of-the-art visualisation tools. Finally, the Management segment (WP2 and WP8) includes all the activities to manage and steer delivery as well as communicate results and ensure sustainability.

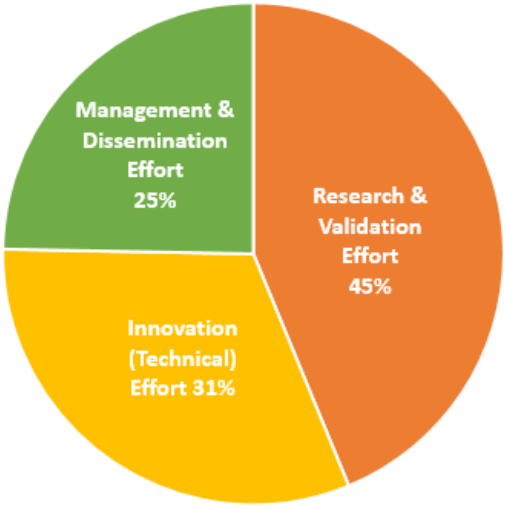


Figure 13: Man Month Distribution

3.4.2 Personnel Costs

PoliVisu's total budget comes to **€3,907,700**. Personnel costs make up majority the total at €2,793,160. AIV has the larges labour cost because as Coordinator they have direct responsibility for the legal and admin side of the project, as well as standardisation work and management of the **PoliVisu** expert panel. The next largest share of personnel costs go to the pilot partners who are active across the entire project from the initial research with their stakeholders, to testing the **PoliVisu** methods and tools on the ground, measuring impact and support dissemination and communication.

3.4.3 Other Direct Costs

The table below highlights the 'other direct costs' for partners whose total exceeds 15% of the personnel costs. Every partner has been allocated €15,000 to cover travel and expenses for project meetings and dissemination events during the project. All fall below the 15% threshold apart from AIV, who has an additional €36,000 to cover the travel and subsistence expenses of the eminent advisory board of policy professionals who will help steer the project to success.

WP	Activity	Cost Category	Amount (€)	Justification
	RIA	Travel and Subsistence	36,000.00 €	Travel cost for Expert Group
	RIA	Travel and Subsistence	15,000.00 €	
		TOTAL COSTS	**51,000.00 €**	

3.4.3 Subcontracting

AIV is also the only partner to have a sub-contracting budget (€90,000) which covers payment to the expert panel for their time contributing to the project at **PoliVisu** project meetings as well as remote work.

Expert Panel Tasks
PoliVisu has appointed an external panel of eminent policy experts (who have signed a letter of acceptance) who will help guide the steering of the project and provide a critical role in terms of methodology and outputs. The panel will be chaired by AIV and consists of:
- **eParticipation Expert:** Prof. Dr. Maria Wimmer (Universität Koblenz - Landau)
- **Living Labs Expert:** Mr. Pieter Ballon (Director of research group SMIT - imec-smit-vub)
- **Policy Modelling Expert:** Professor Yannis Charalabidis (University of Aegean)
- **Policy and Tech Expert:** Mr. Andrew Stott (former UK Government CIO)
- **Geospatial Standards Expert:** Bart De Lathouwer (OGC - Open Geospatial Consortium)
- **Local Government Policy Expert:** Eddy van der Stock (President Linked Organisation of Local Authorities - LOLA npo - and President Vlaamse ICT Organisatie - V-ICT-OR vzw)

Each of the experts has a budget of 15K euro during the 3-year project. The experts have agreed to an assignment of 20 days.

General tasks for the experts (6MD per expert)
Participation to the project meetings (project management meetings and/or specific meetings). 1 meeting a year (6 MD);
Involvement in the project Visioning (D2.1 - WP2).

Specific tasks for the experts (14MD per expert)
These tasks include expert guidance during specific assigned tasks and document review. To make the input of the experts more valuable for the overall project results, the outcome is formulated as participation to deliverables. Nevertheless, the experts will also follow up the formulated tasks in their domain of expertise since every deliverable is linked to at least one project task. Most of the deliverables will be reviewed by more than one expert. In a project like PoliVisu it is very important that a multidomain approach is followed. This is especially the case when a combination of technical knowledge and social/policy expertise is involved.

eParticipation Expert - Prof Maria A. Wimmer
WP3 (Policy modelling methodology) WP6 (Pilot definition) and WP7 (Evaluation)
Deliverables:
- WP3 support & review (D3.1, D3.3, D3.4, D3.5, D3.7, D3.8, D3.9, D3.10)
- WP6 support & review (D6.1, D6.2, D6.3, D6.4)
- WP7 support & review (D7.1, D7.2, D7.3, D7.4, D7.5, D7.6, D7.7)

Living Labs Expert - Prof Pieter Ballon
WP3 (Policy modelling methodology) WP6 (Pilot definition) and WP7 (Evaluation)
Deliverables:
- WP3 support & review (D3.1, D3.3, D3.4, D3.5, D3.7, D3.8, D3.9, D3.10)
- WP6 support & review (D6.1, D6.2, D6.3, D6.4)
- WP7 support & review (D7.1, D7.2, D7.3, D7.4, D7.5, D7.6, D7.7)

Policy Modelling Expert - Prof Yannis Charalabidis
WP3 (Policy modelling methodology), WP6 (Pilot definition) and WP7 (Evaluation)
Deliverables:

- WP3 support & review (D3.1, D3.3, D3.4, D3.5, D3.7, D3.8, D3.9, D3.10)
- WP6 support & review (D6.1, D6.2, D6.3, D6.4)
- WP7 support & review (D7.1, D7.2, D7.3, D7.4, D7.5, D7.6, D.7.7)

Policy and Tech Expert - Andrew Stott
WP4 (Big data analytics and visualisation components), WP5 (Components Integration), WP7 (Evaluation), WP8 (Dissemination, exploitation and standardisation)
Deliverables:

- WP4 support & review (D4.1, D4.2, D4.3, D4.4, D4.5, D4.6, D4.7)
- WP5 support & review (D5.1, D5.2, D5.3, D5.4, D5.5)
- WP7 support & review (D7.1, D7.2, D7.3, D7.4, D7.5, D7.6,D.7.7)
- WP8 support & review (D8.2, D8.3, D8.4)

Geospatial Standards Expert - Bart De Lathouwer
WP4 (Big data analytics and visualisation components), WP6 (Pilot Definition), WP8 (Dissemination, exploitation and standardisation)
Deliverables:

- WP4 support & review (D4.1, D4.2)
- WP6 support & review (D6.1, D6.2, D6.3, D6.4)
- WP8 support & review (D8.1, D8.2, D8.3, D8.8, D8.9, D8.10)
- Supporting PoliVisu with participation to the OGC TC meetings (every 3 months) and support PoliVisu in participating with other domain experts like JRC, USGC and other important players in the OGC network.

Local Government Policy Expert - Eddy Van der Stock
WP6 (Pilot definition) and WP8 (Dissemination, exploitation and standardisation)
Deliverables

- WP6 support & review (D6.1, D6.2, D6.3, D6.4)
- WP8 support & review (D8.1, D8.5, D8.6, D8.7, D8.8, D8.9, D8.10, D8.11)

Total estimate WP
84 MD (14MD * 6 Experts)

Expert	WP3	WP4	WP5	WP6	WP7	WP8	Other
eParticipation	5	0	0	4	5	0	
Living Labs	5	0	0	4	5	0	
Policy Modelling	5	0	0	4	5	0	
Policy & tech	0	3.5	3.5	0	3.5	3.5	
Geo Standards	0	2	0	4	0	3	5
Local Gov	0	0	0	4	0	10	
Total	**15**	**5.5**	**3.5**	**20**	**18.5**	**16.5**	**5**

Section 4: Members of the consortium

4.1. Participants (applicants)

Informatie Vlaanderen (AIV)

INFORMATIE VLAANDEREN	**Informatie Vlaanderen** **(AIV)** (Belgium) Partner n° 1

Partner Introduction

Informatie Vlaanderen (Dutch, translated: Informatie Vlaanderen) is part of the Flemish Government, in Belgium. AIV is a public body tasked with support in the areas of digitization of data in e-government, GIS and public information.

Informatie Vlaanderen is responsible for several project related domains:

- Policy support on digitization, information acquisition, information access;
- Responsible for service creation, service management and access in the GIS and e-government domains;
- Solution realization and optimization in cooperation with government, private organizations and companies in the fields of GIS and e-government;
- Realisation of a central information platform of services for citizens, organizations and companies; https://joinup.ec.europa.eu/community/epractice/case/magda-20-platform;
- Supporting government organizations (direct or indirect, via other intermediate organizations) of citizens, organizations and companies;
- Supporting government organizations to improve their internal processes and services by simplification and digitalisation to enhance a better level of service to their (external) customers;
- Delivery of a central data exchange platform to maximize the usage of government information focussed on information about persons, organisations and companies;
- Information exchange on government services including real estate data of the Flemish government;
- Delivery and access of geographical information via an efficient GDI (Geo Data Infrastructure) platform including all the inspire datasets and other (authentic) geo-data sources (many of them are real estate oriented or can be used in the field of real estate context);

Establishing a digital framework to support and stimulate the realisation of a single and unique information infrastructure.

Key Personnel

Geert Mareels (male), born in , holds master degrees in Administrative Management and in Political Science. He was chief of staff to 3 different ministers from 1995 till 2004. From 1 October 2004 till April 2016 he led CORVE, the eGovernment service of the Flemish Region in Belgium. They built the “MAGDA” platform for sharing data across all government agencies on the Flemish and city level and with Federal data. CORVE is now merged in the

Agency Informatie Vlaanderen, where is he now head of division. In 2017 he was asked to be an expert for the Research Executive Agency of the European Commission

He is also a member of the Flemish Privacy Commission. He was project coordinator of two EU projects: "Citadel on the Move" that aims to facilitate the use of Mobile apps by all municipalities, and "Open TransportNet" that focuses on making GI Data more accessible and useable for business innovators and public sector stakeholders alike. In his spare time he wrote a novel and is member of the board of editors of a magazine on political and social topics.

Lieven Raes, born in , holds master degrees in Administrative Management and land-use planning. Lieven joined in 1999 the Flemish government Transport and Mobility unit. He was responsible for the evaluation methodology of the Flemish local mobility plans, he was project leader of the Flemish cycling plan and participated to the first global Flemish Mobility plan. He was also involved in several fourth, fifth and sixth framework transport, land-use and environment related EU projects. Since 2005 Lieven joined CORVE, the eGovernment service of the Flemish Region which is actually merged to the Informatie Vlaanderen agency. He was responsible for the support and management of several innovative e-government applications. As a GIS expert, he was also involved in analyzing and managing several GIS applications. Lieven was one of the driving forces behind the electronic building grant in cooperation with the department of Land-use planning. Lieven was also responsible for the first business analysis of the Flemish government real estate information exchange process between regional, provincial, local government, real estate sector and the Notaryship. Today, Lieven is consortium coordinator of the EU project "Open TransportNet" project that focuses on making GI Data more accessible and useable for business innovators and public sector stakeholders alike. OTN is focussing on the realization of several smart cities initiatives based on open data in Antwerp, Birmingham, Paris and the Czech Republic.

Jessica Vandendries, born in , is since 10 year active in CORVE and Informatie Vlaanderen and was responsible in the "Citadel on the Move project" and the "OpenTransportNet" project for the organisation of external activities, dissemination, organisational, administrative and financial support.

Relevant Previous and Ongoing Projects & Activities

2014-2017	EU CIP	Open Transport Net (OTN) OpenTransportNet creates collaborative geo-data hubs that aggregate, harmonise, and visualise open transport-related data to make it easier for innovators to create new services and applications. The three high-level goals of OTN are: ● Data Challenge: Harmonise geographic data and open data from a wide variety of sources (city and national geo-data, INSPIRE data, volunteered geographic information, OpenStreetMap…); ● Technology Challenge: Combine geographic information, location-based services and open data to extract new information, data visualisations, mash-ups, and insights; ● Innovation Challenge: Provide tools (APIs) and skills to innovators for using geographic information and location-based services in rapid service creation. The OTN solution will be validated in four pilot locations in the UK (Birmingham), Belgium (Antwerp), France (Issy-les-Moulineaux), and the Czech Republic (Liberec). Total funding: 4 636 000€

2012-2015	EU CIP	Citadel On The Move unleashes the power of mobile technology and open access data to tap into the innovative potential of citizens to deliver smarter city services. It aims to make it easier for cities, citizens, and application developers alike from all over Europe to use Open Data to create the type of innovative mobile applications fulfilling today's societies' needs. At present, governmental Open Data is often difficult to access and use for the developer community, let alone average citizens. Citadel on the Move aims to fill this void by creating: ● Formats that make it easier for local government to release data in usable, interoperable formats, and; ● Tools (a dataset converter and an application generator tool) that make it easier for citizens to create mobile applications that may be shared across Europe and offer services, which may be used on any device, anytime, and anywhere.

Role in the Project

AIV is the Coordinator of PoliVisu and is ultimately responsible for the successful implementation of the project. In addition to management activities, AIV works closely together with ISP.

Eigen Vermogen Informatie Vlaanderen (EVIV)

(The linked third party of Informatie Vlaanderen)

Partner Introduction

EVIV "Eigen Vermogen Informatie Vlaanderen" was set up by the Flemish Government (and approved in a law by the Flemish Parliament) to manage the own income and expenses for part of the Agency Informatie Vlaanderen (AIV). The participation in EU projects was explicitly mentioned in the bylaws of EVIV. EVIV is closely linked to AIV. It has no staff of its own but staff of AIV will perform all tasks for it. The manager of AIV is chairman of the board of EVIV.

Role in the Project

All grants and expenses of AIV, the coordinator, will be managed through EVIV (the AIV's linked third party). A new EVIV's bank account had been set up that will solely be used for this project. This will facilitate both the management and accountability for the project.

IS-practice (ISP)

iS-practice Program Management in Information Society	**IS-practice (ISP)** (Belgium) Partner n° 2

Partner Introduction

IS-practice is a Program Management Office that delivers project management and high-level advice in the broader field of the Information Society for major projects within the international and national public sector. It brings together specialized parties for ambitious research and consultancy projects.

IS-practice is led by Hugo Kerschot, based on more than 20 years of experience in communication, IT, consultancy and project management in both the private and the public sector and multidisciplinary settings within the framework of the European Information Society. It calls its own an international network of experts in the development of innovative projects in the areas of, amongst others, eGovernment, eParticipation, eHealth, and eInclusion that make up Europe's Knowledge Society.

IS-practice works together with both large consulting organizations such as Capgemini and Deloitte Consulting as well as with smaller, highly specialized, companies in the fields of research, technology, and consultancy. The IS-practice network in this way covers a large scope of skills as well as a broad swath of European countries.

Key Personnel

Hugo Kerschot (male) is the founder and Managing Director and (co)-managed the following CIP/FP7 projects during the last three years: Smart City/Public Cloud projects EPIC and ECIM, Open Data projects CITADEL, OpenTransportNet, SSEDIC (Thematic Network electronic ID), and Coordination action MAGHRENOV (Sustainable Energy).

Gisela Gorriz (female) is a consultant and project manager at IS-practice, studied Law at the University of Barcelona. Her responsibilities include the day-to-day management of the large consortium of bIoTope, an EU project building an IoT oPen innovation ecosystem for connected smart objects.

Relevant Publications

1. Kerschot H, Bouchal J (2013) Electronic Identity Adoption: online survey, pp 153-164 in Massimo Felici (Ed.) Cyber Security and Privacy, Springer-Verlag Berlin Heidelberg
2. Kerschot H, Van Gompel R (2009) Development of a standardized framework for measuring eGovernment user satisfaction and impact in the EU, pp 159-177 in Alan R. Shark and S. Toporkoff (eds) Beyond eGovernment Measuring Performance: a global perspective, Washington DC 2010 (US).
3. Van Gompel, R., Steyaert, J. & Kerschot, H. (2008) 'e-Democracy in Flanders: The use of and attitude towards new Information and Communication Technologies (ICT) to support citizen participation in government policy – a survey of key stakeholders', pp. 227-248 in Shark, A.R., Toporkoff, S. (eds.) Beyond e-Government & e-Democracy: A Global perspective. Public Technology Institute & ITEMS International (Washington, Paris)

4. Kerschot, H., Steyaert, J. & Van Gompel, R. (2006) Fed-eView Citizen: Longitudinal study of the internet and eGovernment in Belgium. What citizens think. Leuven, Indigov Research Report, study commissioned by FEDICT, Belgian Federal Administration of ICT.

Relevant Previous and Ongoing Projects & Activities

2016-2018 H2020 bIoTope

The overall objective of bIoTope is to create Systems of Systems (SoS) where information from cross- domain platforms, devices and other information sources can be accessed when, and as needed using Standardised Open APIs. bIoTope Systems are smart in the sense that they learn from experience to make, or propose the most appropriate actions depending on the current user's or object's context/situation. Standardised Open APIs make it possible to compose new SoS from new or existing components and platforms, even without programming. This contributes to speed up the creation of new Internet of Things (IoT) applications and services in open innovation SoS ecosystems.

IS-practice involvement: Proposal writing, project management & coordination, business development.

2014-2017 EU CIP Open Transport Net (OTN)

OpenTransportNet creates collaborative geo-data hubs that aggregate, harmonise, and visualise open transport-related data to make it easier for innovators to create new services and applications. The three high-level goals of OTN are:

- Data Challenge: Harmonise geographic data and open data from a wide variety of sources (city and national geo-data, INSPIRE data, volunteered geographic information, OpenStreetMap…);
- Technology Challenge: Combine geographic information, location-based services and open data to extract new information, data visualisations, mash-ups, and insights;
- Innovation Challenge: Provide tools (APIs) and skills to innovators for using geographic information and location-based services in rapid service creation.

The OTN solution will be validated in four pilot locations in the UK (Birmingham), Belgium (Antwerp), France (Issy-les-Moulineaux), and the Czech Republic (Liberec).

IS-practice involvement: Proposal idea, writing, project management & coordination.

Total funding: 4 636 000€

2014-2017 EU CIP European Cloud Marketplace for Intelligent Mobility (ECIM)

ECIM is a CIP 2007-2013 project. It will develop a state-of-the-art solution that combines the strong cloud capabilities of an existing CIP cloud-based platform, EPIC, with new functionalities that facilitate the easy migration of existing city services and

innovative creation of new ones. It is designed to help support smart, liveable, and connected cities by fostering and bringing together transportation services that make it easier for people and goods to move between destinations as quickly, cheaply, and green as possible. As a part of ECIM pilot validation in Brussels, the Belgian eID card will be used to issue resident parking permits online via ECIM cloud services, building on STORK and STORK 2.0 outcomes.

2012-2015 EU CIP Citadel On The Move

unleashes the power of mobile technology and open access data to tap into the innovative potential of citizens to deliver smarter city services. It aims to make it easier for cities, citizens, and application developers alike from all over Europe to use Open Data to create the type of innovative mobile applications fulfilling today's societies' needs. At present, governmental Open Data is often difficult to access and use for the developer community, let alone average citizens. Citadel on the Move aims to fill this void by creating:

- Formats that make it easier for local government to release data in usable, interoperable formats, and;
- Tools (a dataset converter and an application generator tool) that make it easier for citizens to create mobile applications that may be shared across Europe and offer services, which may be used on any device, anytime, and anywhere.

IS-practice involvement: Proposal idea, proposal writing, project management & coordination.

Role in the Project

IS-practice will work closely with the Coordinator to assist with the project coordination and to take over day-to-day project management activities such supporting the coordinator when liaising with the EU Commission and managing the budget, meetings and conference call organization, quality assurance, risk management, and progress monitoring. IS-practice will also help to define and coordinate the Brussels pilot activities.

EDIP s.r.o (EDIP)

	**EDIP s.r.o.** **(EDIP)** (Czech Republic) Partner n° 3

Partner Introduction

EDIP is a Czech company founded in 2003. EDIP specializes in transport engineering. The company has a particular emphasis on traffic safety, safety audits, traffic counting (significantly contributed to national traffic census 2010) and assessing the capacity of the intersections.

EDIP deals with traffic and transport models (modeling of traffic volumes, evaluation of alternative solutions, traffic professional estimate), GIS services (visualization of different types of transport data that includes but is not limited to traffic volumes, accidents and routing, thematic and digital maps, GID database, geographic traffic analysis) , road safety audit (road inspections, traffic accident analysis and visualization of these type of data, solution suggestions), traffic surveys (research and evaluation all modes of transport, national traffic census), intersection assessment (capacity assessment and solution suggestions), public and cycle transport (analyses, visualization, assessment of the effectiveness and optimalization).

EDIP develops and sells software for traffic engineers and some technical rules and standards for the design of roads and their assessment.

EDIP published twice a year the peer-reviewed journal Traffic Engineering along with organizing a range of conferences and smaller events.

EDIP is a member of the Czech Association of Road Companies and Association of Research Organizations and involves in a number of research projects with the Czech Research Program CR Technology Agency, or the Ministry of Interior. During the last tree years EDIP collaborated in EU project OpenTransportNet dealing with data modeling and visualization.

Key Personnel

Luděk Bartoš (male) is the owner and Director of EDIP company. He is a Civil Engineer by training, he holds an MSc from the Technical University of Prague with research interests in traffic engineering, traffic flow theory, Capacity of intersections and traffic safety. An author and co-author of more than 30 scientific articles and papers, Mr. Bartoš holds 3 technical specifications and key cooperation in technical standardization. He is a member of the Czech Road Company and Chairman of the SAMDI (Road transport and urban engineering), Member of Czech Chamber of Authorized Engineers and Technicians

Jan Martolos (male) is a Project Manager of EDIP Pilzen. He holds a mathematics MSc from the University of West Bohemia with research interests in transport statistics, Traffic flow theory and traffic safety. He has published 35 scientific papers or articles and holds three technical standards with a further 3 software standards. He is also an expert in the mathematical modeling of traffic conditions. Mr. Martolos is a member of the Czech Road Company and member of Czech Chamber of Authorized Engineers and Technicians

Relevant Publications

- Martolos J, Bartos L, Stastny J (2016) Silniční obzor - Czech technical journal for transport engineers: Traffic volumes determination in a national base using macroscopic model
- Bartos L, Martolos J (2015) Certified methodology: Assessment of the road safety and the flow of traffic
- Martolos J, Bartos L, Stastny J (2016) Silniční konference - Czech national road conference – Proceedings: Traffic intensity on classes III roads for the needs of road management regions
- Martolos J, Bartos L (2015) Dopravní inženýrství - Czech refereed technical journal for transport engineers: Updating of the methodology for calculating the capacity of the roundabout
- Bartos L, Martolos J (2013) Certified methodology: Methods of forecasting traffic generated intensity

Relevant Previous and Ongoing Projects & Activities

2014-2017	EU CIP	Open Transport Net (OTN) OpenTransportNet creates collaborative geo-data hubs that aggregate, harmonise, and visualise open transport-related data to make it easier for innovators to create new services and applications. The three high-level goals of OTN are: Data Challenge: Harmonise geographic data and open data from a wide variety of sources (city and national geo-data, INSPIRE data, volunteered geographic information, OpenStreetMap…); Technology Challenge: Combine geographic information, location-based services and open data to extract new information, data visualisations, mash-ups, and insights; Innovation Challenge: Provide tools (APIs) and skills to innovators for using geographic information and location-based services in rapid service creation. The OTN solution will be validated in four pilot locations in the UK (Birmingham), Belgium (Antwerp), France (Issy-les-Moulineaux), and the Czech Republic (Liberec). IS-practice involvement: Proposal idea, writing, project management & coordination. Total funding: 4 636 000€
2014-2017	CR Technology Agency	CITYEKOTRA – better evaluation of economic efficiency for transport constructions in the urban environment The goal of this project: To ensure greater objectivity in assessing of the economic efficiency during the construction of new roads in these cases, when the current state of communication in its entirety, or some sections, passing through built-up area. This primarily involves the capacity of intersections and sections, problems with the road safety in cities and the influence of crossing railway tracks.

2011-2015	Ministry of Interior	SYKRIK - System for global assessment of the dangerous places on the roads and risk management of road safety and the flow of traffic for the Municipal Police´s needs. The goal of this project: To develop the methodology and software tools for the Municipal Police´s needs to be able more effective evaluate the road safety in their jurisdiction and better assess the proposed transport solutions and connecting construction to the communication network.

Role in the Project

EDIP will work closely with the other partners. EDIP will deal with data modeling and visualization or providing access to the database of accidents on the road network of the Czech Republic or a selected region, doing analysis of traffic accidents in terms of their spatial location, identification and of the causes of accidents and their consequences (killed and injured persons, damage), using GIS system to work with the statistical data and spatial localization of traffic.

EDIP will also work closely with the pilots to advise them or to help them find the best solution of their problems.

Issy Média (ISSY)

issymedia Communication & Innovation	**Issy Média** **(ISSY)** (France) Partner n° 4

Partner Introduction

Issy Média is in charge of the communication and the development of new technologies in the city of Issy-les-Moulineaux since 1990. It is a Local Public Company, also known as " SEM (Société d'économie mixte)", whose capital is however held in majority by the city. Its aim is to create a collaborative environment bringing together the public, the private and the research sector in order to build a local Information Society which is innovative and open to all. Issy Média is therefore, following the developments of new technologies benefiting the population, and experimenting new applications and services on its territory. Such an innovative and leading strategy led the city to be enclosed by a study of the European Commission within the 15 European Smartest cities and to be awarded several prizes for its Smart approach.

Having participated, or being currently involved in a large number of projects supported by the European Commission and National Authorities, Issy has a good experience in deploying, testing, disseminating and validating ICT services in realistic conditions through the Living Lab methodology . The city is also member of the European network of Living Labs (ENOLL), a recognition for its role as a Pilot City which contributes to develop, disseminate and exploit several innovative ICT services (Open data portal, innovative transport applications, data journalism application …) within the scope of different projects. One of main latest achievements of Issy Média has been the launch and the management of Issy-les-Moulineaux Open Data portal.

Key Personnel

Eric Legale (male) is the managing director of Issy Media. Prior to joining Issy Media in 1998, Eric Legal was director of the Mayor's office, Andre Santini. He is co-ordinating the ICT-projects of Issy-les-Moulineaux since 1995. He represents the city Issy-les-Moulineaux in different international networks involved in ICT topics, as the Global Cities Dialogue on information society, and international network of mayors engaged to promote an information society for all. He has been finally boosted Issy-les-Moulineaux involvement in EU R&D projects, stimulating its participation since '90s and helping the City to become a well-known Smart City.

Matteo Satta (male) is the EU Project Manager of Issy Média. An international Political Sciences graduate, he is a senior project manager that has been always involved, between France and Italy, in the field of R&D and Innovation (EU and International level) with a particular focus on its valorisation and exploitation.. Since 2005, he has contributed to the management and the development of various European projects, such as e-Photon/ONe, the Researchers' Night in Turin (Italy), OTN, ECIM, Citadel… on the Move and ROUTE-TO-PA, and IPR Licensing programs, such as MPEG Audio (MP3) and DVB-T. During his Issy Média experience, he has managed and developed various Smart City projects with a particular interest in Living Lab, Open Data and Smart Mobility.

Relevant Publications

1. Monthly publication of the Issy-les-Moulineaux hardcopy newsletter 'Point d'Appui'
2. Annual (or 6 month) publication of Practical Guides of the City of Issy-les-Moulineaux
3. Issy-les-Moulineaux website and social networks
4. SO Digital (network of innovation actors of the Urban Agglomeration Grand Paris Seine Ouest) website, social networks and digital newsletter
5. City of Issy-les-Moulineaux open data portal

Relevant Previous and Ongoing Projects & Activities

2016-2017	SGP	SIMUT SIMUT will provide solutions oriented to users, addressing the entire chain of mobility, from the collection of real-time traffic data, thanks to the deployment of sensors to the promotion of multimodal behaviours to reduce car traffic around the construction sites. This project takes into account the use of Big Data, included in an application, to give access to users to real time information on various transport modes (parking, tramway, local trains) to let users have a better multimodal behaviour. Issy has the role of pilot and leader for Dissemination and Communication (including Living Lab activities).
2015-2018	H2020	Raising Open and User-friendly Transparency Enabling Technologies for Public Administrations (ROUTE-TO-PA) This project aims at improving the engagement of citizens by making them able to socially interact over open data, by forming or joining existing online communities that share common interest and discuss common issues. Issy is an external partner of the project, supporting CNRS for piloting activities in Paris Region.
2014-2017	EU CIP	Open Transport Net (OTN) a CIP-PSP Open Geodata project which advances the use of GI and transport-related information by opening, harmonizing and promoting a full range of data to stimulate co-creation of new services. OpenTransportNet will enable anyone to have fun with data, by viewing data mash-up's in maps and graphs and be able to use and embed these maps in their own websites. It will also help public sector users to gain insights from linking and visualising different data sets and be able to make better public service decisions based on the findings. Issy has the role of pilot and leader for Dissemination and Commercialisation tasks (WP leader).
2014-2016	EU CIP	European Cloud Marketplace for Intelligent Mobility (ECIM) ECIM developed a state-of-the-art solution combining the strong cloud capabilities of an existing CIP cloud-based platform, EPIC, with new functionalities that facilitate the easy migration of existing city services and innovative creation of new ones. As a part of ECIM pilot validation in Issy, on street parking (PayByPhone) and an off-street parking solution (BePark) were made available for single sign-in payment

solution mashed-up with existing transport related open data. Issy had the role of pilot and supported Dissemination leader, particularly at local level.

Role in the Project

As one of the consortium's Pilot Smart cities it will have an active participation in deploying, testing, disseminating and exploiting as well as evaluating smart city transport-related innovative services. As Issy has already deployed smart city services, it will therefore engage in transferring experiences to other cities, while also investigating the replicability of services.

In parallel, Issy Média will assume the leading role in WP6 about "Monitoring, Assessment and Validation" activities following its experience within different EU funded project but also its large experience on living lab activities. Moreover, It will support the project communication strategy, but also the activities and different dissemination tools.

Help Service Remote Sensing (HSRS)

HS-RS	**Help Service Remote Sensing** **(HSRS)** (Czech Republic) Partner n° 5

Partner Introduction

Help Service Remote Sensing (HSRS) is a Czech SME (Small and Medium Enterprise) that has been for more than 20 years involved in the Czech and European spatial data market. HSRS offers wide range of services dealing with the creation of geoinformation systems, SDI (Spatial Data Infrastructure) products and spatial applications.

- HSRS is one of the two Czech members of Open Geospatial Consortium (OGC).
- HSRS has a representative in the INSPIRE Drafting Team .
- HSRS is a member of two Czech research networks including Czech Centre for Science and Society (CCSS) and WirelessInfo .
- HSRS is active in the Open Source Geospatial Foundation (OSGEO) .

HSRS team has a long term experience in editing, managing and publishing spatial data. We had been publishing map services many years before INSPIRE was even planned, but once it become concrete and there were first technical requirements we needed to deal with update of our technology in order to fulfil the INSPIRE requirements. We can offer our experience with the update of the SDI infrastructure of the National INSPIRE Geoportal in the Czech Republic based on a combination of Open Source and the ESRI ArcGIS software. HSRS developed its own products such as the metadata catalogue Micka , view client HSlayers . HSRS participate on developing of the Czech National INSPIRE Geoportal http://geoportal.gov.cz/web/guest/home/). HSRS is also involved in the development of the Slovak National INSPIRE Geoportal (http://geoportal.sazp.sk/web/guest/catalogueclient).

HSRS cooperates on the development of several European project portals including Plan4all (www.plan4all.eu) and Habitats (www.habitats.cz, Plan4business (http://www.plan4business.eu/). SmartOpenData (http://www.smartopendata.eu/), OpenTransportNet (http://www.opentransportnet.eu/), SdI4Apps (http://sdi4apps.eu/). HSRS is also developing agriculture application like Prefarm (http://www.mjm.cz/prefarm.php). As OGC member is contributing to Metadata specification.

HSRS has large experiences with the implementation of SDI for different application domains including transport, tourism, agriculture, environment, risk protection and urban planning. (http://geoportal.krajlbc. cz/).

Key Personnel

Dr Štěpán Kafka (male) –education – Charles University Prague, faculty of Natural Sciences, Degree(s) or Diploma(s) obtained – Doctor of Natural Sciences. Employed at VŠB – Technical University Ostrava, Faculty of Mining and Geology, Institute of Economics and Control Systems. Membership of Czech Association for Geoinformation (CAGI), expert drafting team for INSPIRE, Representative of company in OGC. Project participation Wirelessinfo, Premathmod, SpravaDat, Plan4all, Habitats, Plan4business, SmartOpenData.

Ing. Stanislav Holy (male) – Education: 1980-1984 Czech Technical University in Prague, Faculty of Civil Engineering, Department of Geodesy and Cartography Membership in professional organizations: CAGI (Czech Association for Geoinformation), A representative of the organization in the OGC, Professional skills: GIS: Topol, MapServer, ArcGIS OGC standards, PostGIS, Programming Languages: Delphi, Pascal, PHP, relational database, CV: 1984 1987 Geodesy Liberec, traffic mapping, 1987 1992 Geodetic and Cartographic make independent researcher in the field of remote sensing, 1993 present Help service remote sensing Ltd. (HSRS), Director.

Alena Vranova (female) manager of data team, 15 year of experience with GI, customer management and communication.

Relevant Publications

1. Charvat, K., Vohnout, P., Sredl, M., Kafka, S., Mildorf, T., De Bono, A., & Giuliani, G. (2013). Enabling efficient discovery of and access to spatial data services. International Journal of Advanced Computer Science and Applications, 3(3), 28-31.
2. Charvát, K., VOHNOUT, P., KAFKA, S., & CEPICKY, J. (2011). Social Space for Geospatial Information. In IST-Africa 2011 Conference Proceedings. IST-Africa.
3. Charvát, K., Čerba, O., Kafka, Š., Mildorf, T., & Vohnout, P. (2013). The HABITATS Approach to Build the INSPIRE Infrastructure. In Environmental Software Systems. Fostering Information Sharing (pp. 1-10). Springer Berlin Heidelberg.
4. Cepicky, Jachym, Stepan Kafka, and Premysl Vohnout. "HSLayers mapping framework."
5. Vohnout, P., Cerba, O., Kafka, S., Fryml, J., Krivanek, Z., & Holy, S. (2014, May). SmartTouristData approach for connecting local and global tourist information systems. In IST-Africa Conference Proceedings, 2014 (pp. 1-6). IEEE.

Relevant Previous and Ongoing Projects & Activities

The **HABITATS** project (ICT CIP) focused on the adoption of INSPIRE standards through a participatory process to design and validate environmental geospatial data, metadata, and service specifications with European citizens and businesses.

Plan4business project (7FP) developed a platform serving multiple providers and thus offering users a full catalogue of planning data such as transport infrastructure, regional plans, urban plans and zoning plans.

SmartOpenData (7FP) will create a Linked Open Data infrastructure (including software tools and data) fed by public and freely available data resources, existing sources for biodiversity and environment protection and research in rural and European protected areas and its National Parks.

OpenTransportNet (CIP) **O penTransportNet** i s an exciting new project designed to revolutionise the way transport related services are created across Europe. By bringing together open geospatial data within City Data Hubs and enabling it to be viewed in new easy to understand ways,

SDI4Apps (CIP) seeks to build a cloudbased framework with open API for data integration focusing on the development of six pilot applications. The project draws along the lines of INSPIRE, Copernicus and GEOSS and aspires to build a WINWIN strategy for building a successful business for hundreds of SMEs on the basis of European spatial data infrastructures.

Role in the Project

HSRS will be technical partners with focus on standardisation and implementation of Metadata and tools for crowdsourcing. HSRS will also technologically support implementation of Czech pilot. Main part will be focused on discovery of Big Data

Significant infrastructure and/or any major items of technical equipment

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- HSLayers, HSlayers NG
- Mapserver, GeoServer and Micka
- Laymen
- Habitats reference laboratory
- Plan4all Open Data repository
- Thematic Map Viewer
- Location Evaluator
- Map Composer

Geosparc NV (GEOS)

GEOSPARC	**Geosparc NV** **(GEOS)** (Belgium) Partner n° 6

Partner Introduction

Geosparc ("Geospatial Architects") is a software company building geospatial technology, solutions and products. The company commercially supports open source web GIS technology in general and its own open source platform, Geomajas in particular. Geomajas couples the innovative power of open source with the reliability of a true enterprise class application framework. With Geomajas, Geosparc focuses on delivering advanced GIS capabilities in standard web technology and integrate them with existing business applications like ERP, CRM, CMS, BI, BPM, etc. Geomajas showcases very robust security and scalability, while being open and extensible.

Geosparc has several years of experience and expertise in open source geospatial software, web GIS solutions and enterprise integration. Its commercial services and offerings include support contracts with service level agreements, commercial licenses, consulting services, Proof of Concepts, training and support services for web GIS projects (architecture, design, implementation, deployment).

Geosparc provides developers, industries and governments with reliable products and services and innovative ideas to create and integrate Web GIS solutions. In doing so Geosparc helps its customers unlock the full potential of spatial information on the web.

Geosparc has customers in the private and public sector and is active in several international projects.

More recently Geosparc has invested in a product pipeline of spatial enabled SAAS solutions such as Issuedoc, Spotbooking and Sleevemonkey. With these products Geosparc provides end-user solutions for (local) governments supporting their business processes for managing spatial information, public infrastructure and safety.

Key Personnel

Frank Maes (male) – Head Operations. Frank is a Bio-engineer in Land Management and Forestry (KULeuven). He has 20 years of experience as an IT professional, people manager and department head. Before joining Geosparc in 2009, Frank was managing several software projects and teams in innovative technology companies like Tele Atlas and Tomtom. At Geosparc he is responsible for delivering projects and products and works as a senior consultant on GIS IT projects (a.o. Open Transportation Network).

Frank will be the overall project lead for Geosparc and will also be involved in the functional analysis exercise.

Dirk Frigne (male) – CEO. Dirk holds a degree in Electrical Engineering from the University of Gent. He is a visionary entrepreneur in the field of GIS and software engineering and was successful in establishing two companies, DFC Software Engineering (specialized in eGov and spatial software solutions) and Geosparc.

Dirk is a GIS professional with extensive experience, as a developer, architect and project manager (a.o. INSPIRE>>GIS (EC)). He is also very active in various organizations in both Flanders (Secretary Flagis) and internationally (OSGeo) in shaping and developing the GeoICT landscape (strategy, policy, education, technology, standardization).

Dirk will be involved in the project as a senior expert on the exploitation and the business model. His experience and connections can also be leveraged for the distribution of (parts of) the solution as open source software.

Oliver May (male) – Senior software engineer and consultant. Oliver has 8 years of experience as a software engineer, analyst and project lead on various GIS and eGov projects and applications. Oliver is the go-to-person for the technical team as well as the clients and users because he manages to understand both sides and translate between customer requirements, functional and technical specifications.

Oliver will be involved in the technical analysis, converting functional and user requirements into actionable technical requirements. He will also work on the design and development of advanced visualization and analysis components and in the implementation of pilots.

Jan De Moerloose (male) – Software architect. Jan has a PhD in Applied Sciences with over 25 years of experience in ICT and software development as software engineer, architect, technical leader and coach. He has an extended knowledge of Java, web technologies, GIS, SOA and enterprise solutions/applications. Jan has managed and executed several technical R&D projects (a.o. Internet of Things (EC), ARE3NA-AAA (JRC), INSPIRE>>GIS (EC)). Jan is the lead architect on the Geomajas framework and a contributor to other open source libraries like Geotools.

Jan will be the lead architect for the project and will be managing the overall architecture and technical aspects (incl. interfaces, interoperability). He will also be involved in the overall design and implementation of advanced visualization and analysis components. His experience in advanced software engineering, models and rendering of spatial data can be leveraged as well.

Berdien De Roo (female) – Business Analyst/Consultant. Berdien obtained a PhD in Geomatics and Surveying in 2016. Her PhD focused on the development of an archaeological GIS, in which spatial, temporal and thematic data can be considered simultaneously. She gained experience in acquiring user requirements through interviews, questionnaires and user test and has gathered knowledge on spatial databases, database models, GIS (both desktop and web) and web applications.

Berdien will be involved as an “internal user” and key tester for several components and pilots and therefor will be involved from functional analysis, over technical design to pilot testing.

Relevant Previous and Ongoing Projects & Activities

INSPIRE>>GIS

The INSPIRE>>GIS project aims to achieve a total integrated solution to effectively transform, harmonize, publish and use spatial data. A prototype of this end-to-end solution is tested in two pilot projects. The full commercial application will be available one year after the project completion.

The solution allows the integration of spatial data for organizations that must comply with the EC INSPIRE Directive as data providers and data users. This solution enables organizations to create, maintain, easy-to-use INSPIRE data.

ARE3NA-AAA

Geosparc successfully executed the ARE3NA project "Authentication, Authorization and Accounting for Data and Services in EU Public Administrations" (EU DG Informatics), taking on the role of project lead as well as responsibility for the testbed environment. The purpose of this project was to study and demonstrate ways of securing INSPIRE services. The experience gained in this project might be useful when exploring how certain services can be secured and how authentication and authorisation of spatial data services can be implemented.

Open Transport Net (EU Competitiveness and Innovation Framework Programme)

Working as a consultant for the project lead, Geosparc was involved in requirements analysis, functional analysis and design of a web frontend and writing and/or reviewing project documentation like white papers.

Geomajas

Geomajas (www.geomajas.org) is an open source framework for building advanced web GIS solutions. It is internationally recognised as an OSGeo certified project and is being used in several solutions worldwide. Geosparc is the IP owner and major contributor to the Geomajas open source software and has extended experience in managing an open source project and its community. Over the past years we have also gained significant insight in ways to protect and do business with open source.

ESA Landsat 8 web portal

The ESA Landsat 8 web portal allows users to search and download historical and very actual (hours) Landat 8 imagery using both spatial and non-spatial filters. The solution is a web frontend on top of Spacemetric's Keystone Server, an engine for processing, storing and managing imagery. The web client of this solution is created using the Geomajas web technology.

Role in the Project

Geosparc will be the technical leader for the project. As such they will manage the overall architecture with a strong focus on modularity, re-use, interoperability and interfaces. They are the work package leaders for WP3 and will also deliver web components for advanced visualization, analysis and user interaction. Finally Geosparc will be active in the implementation of the pilots.

InnoConnect (INCO)

	**InnoConnect** **(INCO)** (Czech Republic) Partner n° 7

Partner Introduction

InnoConnect was founded in 2016 as a digital innovation start-up company located in Plzeň, Czechia. We work with partners from all over Europe to deliver technology innovation to clients in the fields of smart cities, smart mobility, Internet of Things, open data and geo-data analytics & visualisation. InnoConnect services include big data management, dynamic analytics & visualisation (WebGLayer heatmaps), sensor data & real-time data management, processing & online access, location-based services, and smart mobility consultancy.

WebGLayer allows to develop interactive heatmap visualizations of large datasets (up to 1.5 mil data records) by implementing multiple linked views to present data. Each of the views enables different interactions (such as filtering or relationship analysis) that trigger an instant update of the other views. Users thus benefit from immediate and dynamic data visualizations, gain better understanding of data by applying filters, and develop the opportunity to discover relationships and patterns in the data.

Key Personnel

Jiri Bouchal (male) is a co-founder and director at InnoConnect. Jiri is an experienced eGovernment, Smart city, Smart mobility & IoT consultant and senior project manager of ICT innovation projects.

Jiri's main fields of expertise include (geo)data analytics and visulisations, smart city policies, eGovernment services, eID and eSignatures, geographic information systems, geo-location technologies etc. Jiri has been responsible for coordination of multiple innovation CIP, FP7 and Horizon2020 projects (Citadel, OTN, SSEDIC, ECIM, EPIC). Jiri is also involved in consultancy activities and workshops on eGovernment and electronic identity for both public and private entities. Jiri previously worked at the Ministry of Industry and Trade of the Czech Republic dealing with the EU internal market and competitiveness agenda. He was responsible for the implementation of the Services Directive (2006/123/EC) in the Czech Republic and is a co-author of the Czech Republic's Competitiveness Strategy for 2020, which formulated crosscutting national policy reforms in the field of R&D, innovation and trade promotion.

Dr. Jan Jezek (male) is the co-founder and CTO at InnoConnect. Jan is a software architect, developer and is the author of the WebGLayer open source library, a JavaScript, WebGL-based library for exploratory visualisation of big spatial multivariate data (http://webglayer.org/). Jan holds the PhD in Geoinformatics (2010) from the Czech Technical University in Prague. Jan has been recently managing several software projects and contributed to various research projects focused on GIS and spatial data.

As a postdoc at the Section of Computer Graphics at the Department of Computer Science and Engineering of the University of West Bohemia, Jan's research activities include information visualization and geovisualization of big

data and involvement in EU projects (e.g. Humboldt, Plan4All, Plan4Business, OpenTransportNet) as a software engineer and technical manager.

Jan has also been engaged as a software developer in the US-based company (Voyager Search) delivering geo-spatial tools for enterprises. Jan furthermore developed real-time tracking solution for a company car fleet management.

Relevant Previous and Ongoing Projects & Activities

- Dynamic Map Visualisation of almost 30.000 car accident in the Birmingham area.
  - http://www.opentransportnet.eu/web/birmingham/car-accidents
- UK Traffic flow in the Birmingham area (data from traffic cameras)
  - http://www.opentransportnet.eu/web/birmingham/traffic-flow
- Dynamic Map Visualisation of more than 63 thousand traffic accidents that happened in Flanders in 2014-2016
  - http://innoconnect.net/apps/flanders-traffic-accidents/ (CONFIDENTIAL, please do not share publicly: username: opentransportnet, password: webglayer)
- Visualisation of traffic data (counts of vehicles) from road cameras located in the Turnhout region, Belgium
  - http://innoconnect.net/development/macq/

Relevant Publications

- Ježek, J., Jedlička, K., Mildorf, T., Kellar, J., & Beran, D. (2017). Design and Evaluation of WebGL-Based Heat Map Visualization for Big Point Data. In The Rise of Big Spatial Data (pp. 13-26). Springer International Publishing.
- Ježek, J., & Kolingerová, I. (2014). Stcode: The text encoding algorithm for latitude/longitude/time. In Connecting a Digital Europe Through Location and Place (pp. 163-177). Springer International Publishing.
- Charvat, K., Kubicek, P., Talhofer, V., Konecny, M., & Jezek, J. (2008). Spatial data infrastructure and geovisualization in emergency management. In Resilience of Cities to Terrorist and other Threats (pp. 443-473). Springer Netherlands.
- Jedlička, K., Ježek, J., Kepka, M., Hájek, P., Mildorf, T., Kolovský, F., & Beran, D. (2015). Dynamic Visualization of Volume of Traffic. Papers ICC, 1-13.

Role in the Project

InnoConnect will be responsible for the development of a web-based tool for big data interactive analysis and visualisation, extending further the WebGLayer open source library according to the pilot needs. The tool shall be integrated with the other technical components.

Cityzen Data (CZD)

	**Cityzen Data** **(CZD)** (France) Partner n° 8

Partner Introduction

Cityzen Data was founded in 2013 and was born from the needs of the Smart Sensing consortium that created connected fabric used in sports garments. In close connection with Cityzen Sciences, Cityzen Data analyzes data for sport, health and wellness markets and, in this respect, has already strong connections, partnerships and clients in Europe, China and USA in such fields/markets. Cityzen Data addresses worldwide companies and SMEs to give value from new services that they can thus offer to their customers, users and patients. Cityzen Data's goal is to provide a scalable, secure, ethical and open platform for sensor data that acts as an accelerator for any project. In this respect, the Cityzen Data platform fulfils the following functionalities:

- Store and manipulate data defined by time and location (Geo Time Series);
- Ingest real-time data (from 100K to 1500K Datapoint/sec/core);
- Perform generic and advanced functions that are adaptable to any business (energy, transport, industry, health, sport, home and cities, monitoring, security…);
- Propose a value added language to manipulate Machine Data;
- Includes machine learning and predictive analysis algorithms;
- Allow users for customizing the data and/or results from data analytics (e.g., data to be opened or not).

Key Personnel

Hervé Rannou (male) is co-founder, CEO and VP Programmes Management. He has a personal background in IT and telecommunications. Within ITEMS International, a consulting company, original expertise by mixing approaches in technology, economy and strategy. He carried out many studies in various sectors like Smart Cities, Health, Industries, Energy … He has a good expertise in development of Internet services (from technology to business models), open data / data, standardization, open innovation. He is a graduate in Mathematics (Rennes 1980), and Telecommunications Engineer (Paris, 1981).

Mathias Herberts (male) is co-founder and CTO of Cityzen Data, he leads the development of the sensor data management platform. Prior to Cityzen Data, Mathias lead the Big Data initiative in a French bank, role for which he received the Big Data innovation award in 2013. M. Herberts also worked at Google in a team responsible for managing the company wide Big Table storage systems. He has been recently ranked #5 as the most influential persons in Big Data and Hadoop. Mathias holds an engineering degree in Telecommunications and Computer Science from Telecom Bretagne.

Laurent Le Breton (male) is the originator of Dassault Systèmes 3DExperienceCity project and product line (https://www.3dexperiencity.com/). He then founded a startup called ForCity platform in December 2014 that is

now a 20 employees company based in Rennes (west of France) to deliver a Cloud systemic modelling platform for territory systems simulation (http://www.forcity.com/en/).

Horacio Gonzalez (male) is a senior software engineer at Cityzen Data, leading the development of frontend applications. Before joining Cityzen Data, Horacio was Senior Software Engineer in a french bank, working in the Architecture and Methodology service. Horacio is also leader of the FinistJUG and GDG Finistère, two developer communities in the far corner of Brittany. Horacio holds an engineering degree in Telecommunications and Computer Science from the Universidad Politécnica de Madrid and a PhD in Electronics from Telecom Bretagne.

Relevant Publications, Products and Services

1. Big Data Innovation Awards - First Prize (2013) Big Data Paris Conference 2013, Sopra Group/ Journal du Net.
2. Rannou, H., Soupizet, J.-F. and Toporkoff, S. (2002) Les Stratégies Numériques Publiques (Public Digital Strategies), Le Cahier du Numérique (European Commission), 2(3), 299-316 ;
3. Rannou, H. (2013) L'Internet des objets: d'une vision globale à des applications bien plus éparses (IoT: from a global vision to much more scattered applications), Annales des Mines-Réalités industrielles, 70-73;
4. **CONTINUUM** is a Geo Times Series Ingestion and Storage architecture (100K mesures/sec to 1,5 million measures/sec) that includes scalable storage based on NoSQL Technology, stable query time solutions, and supporting various Typed Values (numeric, booleans, UTF8 Strings…) ;
5. **EINSTEIN** is a Stack Based Language developed by Cityzen Data with more than 400 functions and 5 high level frameworks, which aims to manipulate large geo-time series from sensors. EINSTEIN offers 5 manipulation frameworks : BUCKETIZE, MAP, REDUCE, APPLY, FILTER. Some of these frameworks allow for bulk manipulation of series, working on equivalence classes of series based on labels and using JSON Outputs to ensure interoperability with most application environments (existing architecture);
6. **PLASMA** is a real-time sub-system that makes it possible to subscribe to Geo Time Series™ (get notified of new values instantaneously), to build real-time dynamic dashboards and to connect to external components to do Complex Event Processing;
7. **QUANTUM** is the visualization module that makes it possible to visualize results from your Einstein scripts in an embeddable widget, to rapidly create dashboards with data from our platform based on Reusable Web Components, to support for Temporal and Spatial dimensions. A screenshot of the QUANTUM module is provided below in the context of “Team monitoring”.

Relevant Previous and Ongoing Projects & Activities

2016 - 2018	H2020	Biotope : Building an IoT OPen innovation Ecosystem for connected smart objects) Research and Innovation action) project funded by the Horizon 2020 programme, Call ICT30: Internet of Things and Platforms for Connected Smart Objects. Total granted: 213.750 €
2016	BOUYGUES / Colas	Data analytics applied to internal hehicles including cars and trucks Analyzing consumption of gas along a long period in a fleet management perspective.

		Analyse and option for optimisation of cars and trucks movements Detection of anomalies Geo visualisation Project carried out with an appplication partner 'Savecode) Total project: 75.000€
2015	Engie	GDF-SUEZ : Data analytics for data coming from Smart Meters and Digital Home (Ecometering) – FI-PPP GDF Suez Dolce Vita is a French electricity provider that uses the ERDF infrastructures and smart meters. Cityzen Data provides Data Analytics on data coming from Smart meters and from devices consumption within homes. Total project: 100.000€
2014-2015	French gov agency Funded	Data analytics for data coming from Smart fabric (SmartSensing). Biometrics sensors are embeded within the fabric. Actimetric sensors are embeded with the gateway. The Smart Sensing technology generates 200.000 measures per hour. Total funding: 500.000 €
2015-2016	Airbus	Data analytics on data stored within flight recorders Volume of data: Number of flights to analyze: 100,000 x Number of Parameter to analyze: 30 x Data Volume/Flight: xx GB Correlation analytics, Pattern recognition, Predictive modelling. Total project: 50.000 €

Role in the Project

Cityzen Data has today a background in managing data in energy, mobility (multimodality, traffic, cars, digital devices and applications), and monitoring infrastructures, systems and applications. Cityzen Data works with Cities on the future of Data management. The company has today its own vision of the future of data management considering the development of issues like smart energy, smart mobility, connected cities, open innovation and accelerator ecosystems.

Cityzen Data will have a key role in:

- Big Data Management (WP3) in the perspective of building up a Smart data City Infrastructure plus functions to cross different sources of data and to analyze them,
- Developing appropriate and efficient interface with visualization tools and techniques (WP4) including real time tools to filter data, to aggregate data, to "blur" data
- Pilot scenarios and deployment (WP5) to implement the platform in an industrial perspective.

Taking profit of its expertise on data for Smart Cities, Cityzen Data will participate to WP2 (Policy/Governance) and WP7 (Standardization).

21C Consultancy Limited (21C)

21c Work Smarter	**21C Consultancy Limited** **(21C)** (United Kingdom) Partner n° 9

Partner troduction

21c Consultancy Ltd (21c) is a British SME with an established track record in designing, delivering and promoting successful ICT innovation initiatives that generate multi-stakeholder engagement (business, public sector, civil society and academia) across multiple communication channels. The team specialises in combining Open Data and Co-Creation to kick start innovation, citizen engagement and improve public services and policy. For close to a decade, 21c has driven the shift toward citizen-centric government. We are experts in understanding the new technologies that are about to reshape the way government is delivered, and work alongside public administrators in driving successful change. National government departments that consult 21c on our path breaking work in the rapidly evolving world of Smart ICT include: India Department of Administrative Reform (DARPG), Oman Information Technology Authority (ITA), Emirates Identity Authority (EIDA), Bahrain government Authority, Kazakhstan National Information Centre (NIC), Flemish eGovernment Authority (CORVE) and UK Communities and Local Government (CLG). Our work centres on three key areas:

- Open Innovation: A trend toward greater co-creation and collaboration between government and citizens in the creation of new public services
- Open Data: The fuel for 'Open Innovation' and 'Smarter Government'
- eParticipation: The use of new social media tools to foster a more transparent and collaborative relationship between citizens and government

21c specialises in providing every functional aspect of stakeholder engagement, communication and dissemination and pilot support (including user requirement gathering and execution). We regularly work on a collaborative model with subject matter experts from throughout the ICT innovation world on European projects (FP7, CIP, ERASMUS, H2020) to create, deploy and promote user-friendly ICT solutions. Blending ICT and communications expertise, our team draft White Papers and Policy Briefings for policy-makers at the local, regional, and national level, organise workshops, conferences and exhibits, engage and enthuse stakeholders and promote ICT projects, initiatives and publications. Few other firms combines 21c's unique blend of deep Open Data domain expertise, academic writing credentials, analytic skills and specialist PR/Marketing expertise.

Key Personnel

Susie Ruston McAleer (female). Susie Ruston is an accomplished Digital Government practitioner and thought leader with over 15 years experience helping public administrations across the globe harness the transformational power of technology. A founding partner of 21c consultancy, Ms. McAleer regularly works with international organisations such as the United Nations and European Commission as an expert eGovernment consultant and evaluator. Her portfolio of global clients includes the governments of Great Britain, Belgium, UAE, Bahrain, Kazakhstan and India as well as multiple pan-European cities and regions.

Since 2007, Susie has helped to pioneer the European Commission's Smart City agenda, conceptualising and delivering a wide array of cloud and data based innovation initiatives. She launched OpenTransportNet (OTN) –

a multimillion Euro geospatial project which aims to make transport-related data more open and accessible to urban planners and travelers alike. Prior to OTN, Susie directed Citadel-on-the-Move – a pioneering Smart City Open Data project that has helped over 140 cities across 6 continents to open and use data.

Working alongside the UNDP team in New Delhi, Susie is currently helping the Government of India to develop and implement an aggressive action plan to improve online service delivery and bolster the country's international eGovernment performance. An expert on the UN's highly influential eGovernment Survey, she is also working with the Republic of Kazakhstan to identify and develop strong UN Public Service Award projects.

Throughout the years, Susie has written and edited numerous specialist papers and journals, including a United Nations and Council of Europe book on eParticipation. She serves on the organising committee of a wide array of international conferences, including the Global Forum, and is regularly asked to review articles on eGovernment best practice.

Prior to co-founding 21c, Susie was a consultant with Accenture eDemocracy Services where she helped to champion eParticipation and engagement across Europe and Asia. She began her career with the internationally recognised eVoting company Election.Com where she played a pivotal role in the development new OASIS data standards for the election market.

Aneta Rapacz (female). Aneta is an accomplished project manager, researcher and training facilitator with extensive first-hand knowledge of open and spatial data. She is currently conducting primary and secondary research using qualitative and quantitative research methods for EU projects as well as overseeing day-to-day operations of OpenTransportNet (OTN) – an EU-funded Open Geodata project which advances the use of GI and transport-related information by opening, harmonizing and promoting a full range of data to stimulate new services and ECIM – an EU-funded Smart Mobility project which is combining open public and private sector databases across Europe to create an European Marketplace for Intelligent Mobility. Prior to these projects, Aneta helped to design and deliver a range of Open Data Training workshops for Citadel-on-Move – a pan-European project which helped over 140 cities across six continents to open and use data. She has also assisted in road mapping and preparing policy recommendations using case study analysis for FutureEnterprise, a project that bridges the gap between past and future business models.

Practised in Living Lab methodologies, Aneta regularly brings together stakeholders from across Europe to co-design creative new solutions and applications using data. She recently ran a series of co-creation workshops with OTN pilot cities to define their needs and outline new services to be built using new data hubs. Aneta also enjoys applying her facilitation skills to Open Data Training where she is currently managing 21c's Student Entrepreneur Hack Days, which bring together students of all ages (from as young as 8 and up to 18). Aneta believes all that training should be as fun and accessible as our student days and aspires to inject excitement and enthusiasm into each and every session she runs.

Aneta holds a BA from Westminster in Politics & European Politics and an MSc in European Public Policy from University College London. She focused her research on the applied use of behavioural insights and inadequate promotion of energy efficiency measures by energy companies. Prior to joining 21c, Aneta worked for FRONTEX – the European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the EU in Warsaw, where she managed a range of projects on the regulatory and administrative sides of the organization. Aneta is fluent in Polish, English and French.

Pavel Kogut (male). Pavel is an experienced researcher, data analyst and training facilitator. Since joining 21c in 2014, he has worked across our extensive portfolio of Open Data projects including Ag-Infra, which partnered with the UN food and Agricultural Organisation to create an international infrastructure for sharing agricultural research, Citadel on the Move, which created tools to make it easier for local authorities (regardless of their size

or budget) to open and use data, and OpenTransportNet and ECIM, which are currently using geospatial data to deliver cross-border Smart Mobility.

Until recently Pavel ran 21c's data helpline, answering data-related inquiries for public sector administrators from across Europe. These hands-on, day-to-day interactions gave Pavel unparalleled insights into the most common challenges and obstacles public administrators face in the open and geospatial data domains. His support helping civil servants to use Citadel's data conversion tools enabled Pavel to compile Europe's most comprehensive data base to date on the most commonly used open data structures and formats used by public administrations.

From Whitehall officials through to urban transport officers and students, Pavel brings his extensive understanding of public sector data challenges and opportunities to all of 21c's training sessions – ensuring that they always blend theoretical best practice with a strong first hand understanding of on-the-ground realities.

Prior to joining 21c Pavel was an assistant analyst at the Hague Centre for Strategic Studies, a think-tank, where he worked on projects commissioned by high-level clients, among them the Ministry of Defence, the Ministry of Foreign Affairs and the Dutch Safety Board. Before that he was a trainee at the European Economic and Social Committee, a consultative body of the EU. There Pavel worked closely with the EESC Labour Market Observatory on an impact study of youth unemployment. Pavel's career in research began in London's third sector where he helped a number of charities evaluate their projects for Big Lottery, a funder. Pavel obtained his Master's degree from LSE.

Relevant Publications, Products and Services

1. Ruston McAleer, Susie, Glidden, Julia, Legale, Eric et al. 'The Trend Toward Mobility Service Integration: The case of ECIM (European Cloud Marketplace for Integrated Mobility) 22 nd ITS World Congress, 5–9 October 2015, Bordeaux, France.
2. Glidden, Julia, Ruston McAleer, Susie. '6 Top Tips for Building a Smart City with Data,' Open Data Institute Blog, 14 July 2015.
3. Glidden, Julia, Ruston McAleer, Susie et.al. 'Puzzled by Policy: Helping You be part of the EU' 5th International conference on eParticipation, 17-19 September 2013 Koblenz, Germany.
4. Glidden, Julia, Ruston McAleer, Susie et.al. 'Citadel on the Move: Open Data...Unlocking Cross Border Innovation,' OneConference in Prague, April 2013.
5. Ballon, Pieter, Glidden, Julia, Kranas, Pavlos, Menychtas, Andreas, Ruston, Susie, Van Der Graaf, Shenja. (2011) 'Is there a Need for a Cloud Platform for European Smart Cities?', eChallenges e-2011 Conference.

Relevant Previous and Ongoing Projects & Activities

2016	United Nations	India National eGovernance Plan UNDP is partnering with Department of Administrative Reforms and Public Grievances (DARPG), Government of India on good governance initiatives and strengthening implementation of e-governance reforms to improve service delivery for citizens. In India, the e-governance initiative is handled through the National e-Governance Plan (NeGP) that aims at improving the delivery of Government services to citizens and businesses. Its vision is to "Make all Government services accessible to the common man in his locality, through common service delivery outlets, and ensure efficiency, transparency, and

reliability of such services at affordable costs to realise the basic needs of the common man".

21c involvement: Developed Roadmap project to transform public service through eGovernance policy under the digital India agenda. Project included detailed task development for roadmap and in-depth review, analysis and comparison of india.gov.in with other best practice national portals and service policies from across the world in order to draw recommendations for public service's enhancement.

Total funding: $ 100,000

2014-2016	EU CIP	ECIM (CIP Smart Cities Pilot B project) ECIM (European Cloud Marketplace for Intelligent Mobility, http://www.ecim-cities.eu/) is a CIP 2007-2013 project, which includes 14 partners, amongst which a range of innovative SMEs in the mobility, from 6 countries. It will develop a state-of-the-art solution that combines the strong cloud capabilities of an existing CIP cloud-based platform, EPIC, with new functionalities that facilitate the easy migration of existing city mobility services and innovative creation of new ones. It is designed to help support smart, liveable, and connected cities by fostering and bringing together mobility services (on- and off-street parking, public transportation, bike sharing, payment etc) that make it easier for people and goods to move between destinations as quickly, cheaply, and greenly as possible. **21c involvement:** Proposal idea, proposal writing, communication, dissemination and exploitation, business development. Total Funding: € 4.384.000
2014-2017	EU CIP	Open Transport Net (OTN) OpenTransportNet (http://www.opentransportnet.eu/) creates collaborative geo-data hubs that aggregate, harmonise, and visualise open transport-related data to make it easier for innovators to create new services and applications. The three high-level goals of OTN are: ● Data Challenge: Harmonise geographic data and open data from a wide variety of sources (city and national geo-data, INSPIRE data, volunteered geographic information, OpenStreetMap etc.) ● Technology Challenge: Combine geographic information, location-based services and open data to extract new information, data visualisations, mash-ups, and insights ● Innovation Challenge: Provide tools (APIs) and skills to innovators for using geographic information and location-based services in rapid service creation

The OTN solution will be validated in four pilot locations in the UK (Birmingham), Belgium (Antwerp), France (Issy-les-Moulineaux) and the Czech Republic (Liberec region).

21c involvement: Proposal idea, proposal writing, user requirements development, co-creation methodology, pilot deployment, communications, exploitation and business development.

Total funding: 4 636 000€

2013 EU

Optimising the Role of ICT in Policy Making (EC)

The framework study conducted a thorough analysis of the role of ICT and eGovernment within the provision of policy services for Europe. In addition to generating concrete recommendations for different fields, the final report created a governance framework for future ICT interventions

21c involvement: Proposal writing, policy research, evaluation and analysis, report writing

Total funding: €70,000 (21c's share)

2012-2014 EU

CITADEL… on the Move (CIP Smart Cities Pilot B Project)

Citadel on the Move unleashes the power of mobile TECHNOLOGY and open access DATA to tap into the INNOVATIVE potential of citizens to deliver smarter city services. It aims to make it easier for citizens and application developers alike from across Europe to use Open Data to create the type of innovative mobile applications that they want and need. At present, Open Government Data is often difficult to access and use by the developer community, let alone the average citizen. Citadel on the Move aims to fulfill this need by:

- Creating formats that make it easier for local government to release data in usable, interoperable formats, and;
- Templates that make it easier for citizens to create mobile applications that can be potentially shared across Europe creating services that can be used on any device, anytime, anywhere.

"Citadel on the move" website for more information: www.citadelonthemove.eu

21c involvement: proposal idea, proposal writing, project management & coordination.

Total funding: €3.840.000

Role in the Project

21c will be responsible for leading WP7 Communication and dissemination: to plan, establish and manage the tasks related to dissemination, engagement, exploitation and stakeholder management. In addition, 21c will support research tasks related to building the PoliVisu framework and developing the PoliVisu Playbox.

Athens Technology Center SA (ATC)

	Athens Technology Center SA (Greece) Partner n° 10

Partner Introduction

Founded in 1987, ATC is an Information Technology Company (SME) offering solutions and services targeting specific sectors incl. the Media, Banking and Retail Sectors, Utilities and Public Sector Organisations as well as horizontal solutions focusing on Content Management, Enterprise Software, Web Applications, Human Capital Resource Management and eLearning, and Mobile Applications. The activities of the Company span among several countries in EU, Eastern Europe and CIS countries, as well as the Balkans.

Having acquired ISO 9001 certification since 2000, the company provides a broad spectrum of value-added products and services such as consulting, customer training, installation and maintenance, warranty and post-warranty services, SLA projects, project management, and professional support. ATC has also been certified with ISO 27001:2005 for our Information Security Management system applicable to Design, Development, Implementation and Support of ICT solutions and digital services, as well as for Technical, Business, Consulting and Project Management Services in the ICT domain.

Central to the Company's strategy is the conduction of vivid Research and Development, focusing both in improving current Products and Solutions, as well as in exploring new technologies for future growth. All ATC own products and services are based on early prototypes and/or "proof of concept" obtained through R&D Projects, whether funded by the Company, the Greek State or the European Commission. The ATC Innovation Lab (http://ilab.atc.gr/) carries more than 25 years of expertise in Research and Development. The focus is on innovation aspects, which are often overshadowed by research concerns, and on turning promising ideas into concrete and robust products, in a cost and time-efficient manner. Having incubated most of the current commercially oriented ATC business units we are committed to continue along this successful path: Discover or conceptualize Innovation first, then turn it into working systems through intense and continuous involvement in cutting-edge research projects. The focus is primarily given in areas that can offer the next big advance to ATC's commercial offerings, but also in discovering new domains and create the next company targets.

ATC offers professional solutions for eGovernance portals based on popular Open Source and Open Platform Solutions. We support all popular platforms as DNN (Dot Net Nuke), WordPress, Joomla, Drupal and Liferay. Capitalizing on the technological know-how accumulated in several European eGovernance pilot projects, we are offering solutions for eGovernment and eParticipation based on our own open source platform. The platform comprises a set of modules supporting the interaction between public bodies and citizens enabling the latter to actively participate in public affairs, in decision-making and in the shaping of policies with security, reliability and efficiency.

ATC has long experience in integrating applications related to the analysis of large scale data sets. Our experience lies both in the combination of different modules as well as in the setting up of large databases and search engines. ATC, is a partner in the NESSI ETP (www.nessi-europe.com) and a full member in the Big Data Value Association (www.bdva.eu).

Key Personnel

Dr. Nikos Sarris (Male) has been working in ATC as a Senior IT Consultant since 2004 and currently is the Head of Operations of the ATC Innovation Lab. He has been working since 1996 in R&D projects as a researcher, project manager and coordinator of large multinational consortia. He has received his PhD from the Aristotle University of Thessaloniki and his Master of Engineering degree from the University of Manchester Institute of Science and Technology. He has worked as a Researcher for the Aristotle University of Thessaloniki and the Informatics and Telematics Institute, where he participated in several national and European projects. He has edited a book in 3D modelling and animation and authored numerous publications for international journals and conferences. Dr Sarris has been the coordinator of four 3-year multinational R&D projects and has been the technical leader of another four projects of such duration, with budgets ranging from 3M€ to 10M€. In the latest years he has mainly been involved in media related R&D, focusing in the semantic analysis and 'understanding' of multimedia news content and Big Data. Dr Sarris is a member of the Steering Committee of the NESSI European Technology Platform and the representative of ATC in the General Assembly of the Big Data Value Association.

Dr. Eva Jaho (Female), is a project manager in the ATC Innovation Lab. She received her PhD and MsC in Networking from the Department of Informatics and Telecommunications of the National & Kapodistrian University of Athens, Greece, in 2011 and 2007 respectively. She received the Diploma degree from the same university department in 2005. She has participated in several European research projects in the field of networking and telecommunications and has authored numerous publications for international journals and conferences. Her main research interests lie on the analysis of content networks and data dissemination, as well as social networking applications.

Relevant Publications

1. Charalabidis Y., Loukis E., Androutsopoulou A., Triantafillou A.(2014): Passive Crowdsourcing in Government Using Social Media; Transforming Government: People, Process and Policy, Emerald, United Kingdom;
2. Charalabidis Y., Triantafillou A., Karkaletsis V. and Loukis E., Public Policy Formulation through Non Moderated Crowdsourcing in Social Media: Lecture Notes in Computer Science Volume 7444, 2012, pp 156-169 (http://link.springer.com/chapter/10.1007/978-3-642-33250-0_14#page-1)
3. Spiliotopoulos, D, Dalianis, A., Kouroupetroglou, G. (2014): Accessibility Driven Design for Policy Argumentation Modelling, Proc. 15th Int. Conf. on Human Computer Interaction, Heraklion, Crete, to appear.
4. E.Jaho, E.Tzoannos, A.Papadopoulos, N.Sarris, "Alethiometer: a Framework for Assessing Trustworthiness", International World Wide Web Conference Committee (IW3C2), April 7-11, 2014, Seoul, Korea
5. E.Jaho, V. Koutsiouris, E.Argyzoudis, R.Brown, "Moving around in Smart Cities: Developing Efficient Mobile Services using Open Data", Hybrid City 2013: Subtle rEvolutions, 2nd International Biennial Conference, 23-25 May, 2013

Relevant Previous and Ongoing Project & Activities

ATC's has served as a Major technology provider in the following FP7 & H2020 related projects:

§ **H2020-INSO1-2014 YDS [645886]: "Your Data Stories":** YDS envisions to combine and fuse the two "suppliers" of open data (traditional producers and user-generated content) and to exploit the added value from this amalgamation in order to better satisfy the needs of the "demand side" – meaning

citizens, journalists and others. YourDataStories wants to develop the required software stack that will enable the Open Government Data (OGD) to reach citizens in their everyday online life, inside the digital social interaction they are already familiar with, acquiring a significant role in citizen's social activity. ATC is the project coordinator of the project as well as responsible for the implementation of the platform and the mobile applications. More information at http://yourdatastories.eu

- **CIP-ICT-PSP-2011-5 Citadel on the Move [297188]: Open Innovation for Internet-Enabled Services in 'Smart cities':** Opening government data to enable citizen-generated mobile apps. ATC participates in the implementation of the Citadel platform as well as in the implementation of the mobile applications. More information at http://www.citadelonthemove.eu/
- **CIP-ICT-PSP-2010-4 EPIC [270895]: "European Platform for Intelligent Cities":** The project was more than just an IT platform - it was a one stop shop were medium sized Cities in Europe (50.000 – 500.000 inhabitants) can find real, affordable solutions (products and services) to materialize the "Smart Cities" concept in an highly achievable and cost-effective manner. The EPIC project solution combines cloud computing with 'Future of the Internet' technologies to provide cities with new tools and possibilities for the creation and sharing of efficient, effective and economic 'smarter' city services. ATC was the responsible partner for the platform implementation - See more at: http://www.epic-cities.eu/
- **FP7-ICT-2009-4 COCKPIT [248222] "Citizens Collaboration and Co-Creation in Public Sector Service Provision":** The fundamental idea of COCKPIT was that Web 2.0 social media constitute the emerging and de facto mass collaboration and cooperation platform between citizens themselves, and between citizens and public administrations. Therefore, Web 2.0 social media will very soon establish themselves as a very effective means for creating, sharing and tracking knowledge about citizens' opinions and wishes on public service delivery. ATC's main responsibility was the implementation of the engine for the sentiment analysis as well as for the Collaboration platform. More information at http://www.cockpit-project.eu
- **FP7-ICT-2013-10 REVEAL [610928]** "REVEALing hidden concepts in Social Media" (2013-2016): Novel framework for discovering higher level concepts hidden within information based on three pillars: Contributor, Content, and Context. ATC was the Technical Coordinator and integrator. More information at: http://revealproject.eu/

Role in the Project

ATC is responsible for the integration of services, both in the systems of the pilot cities as well as on the demonstration platform, also having support from the relevant local technical partners in the three pilot cities. ATC is also responsible for adapting and improving the Social Media Analysis service, based on our TruthNest commercially available service.

***Správa informačních technologií Města Plzně* (SITMP)**

Správa informačních technologií Plzeň	**Správa informačních technologií Města Plzně (SITMP)** (Czech Republic) Partner n° 11

Partner Introduction

The city of Plzeň recently announced its smart city policy, with mobility as one of its cornerstone domains. The city was ranked 2nd in the 2016 Open Data ranking in Czechia, with the largest yearly progress among Czech cities. The proposed solution fits in Plzeň's smart city strategy built around an effort to make its services more aligned with and responsive to citizen needs and in line with the evidence-based policy making approach.

Správa Informačních Technologií města Plzně, as a part of the city of Plzeň, is the public company which is responsible for ICT of the city Plzeň.

Basic quantification of our core business: 6000 PC, 150 km of optical metropolitan network, around 1400 request from customers/monthly, 2 data centres (level TIER 3), key app. SAP, MS, AGENDIO, GIS, eSPIS, SOL, etc., we provide services for city hall, city parts, city police and around 100 city companies (elementary schools, kindergartens, city waterworks, heating plants, transport company, other city companies).

Our other activities/projects:

- Education (we focused in education process – interactive education technology, education of teachers in ICT, cybernetics, et., education of children in leisure education, we operated Centre of Robotics, etc. = support of technical education in Pilsen
- Dronet (science and technology park for unmanned aerial vehicles = drones)
- IoT - we operated IoT on the LoRa platform in Pilsen, we use it for city companies and for research (cooperation with local university)
- We participate in SMART CITY PILSEN as the ICT integrator. Annual turnover 7,5 mil Euro, 94 employees.

Key Personnel

Stanislav Štangl (male) is the leader of our GIS department. He is responsible for city GIS platform development. Stanislav participated on the key projects as a Opendata, Online network report, GIS waste management, Plznito (online citizen reporting of any problems and issues in the city), etc.

Václav Kučera (male) is a senior engineer in GIS department. He participated on our main GIS projects as a Opendata, Online network report, GIS waste management, Plznito, integration of municipality GIS (waterworks, heating plants, transportation).

Luděk Šantora (male) is CEO of Správa Informačních Technologií města Plzně. Last projects – Smart City, Dronet, Smart Edu, Pilsen Card, Centre of Robotics, etc.

Relevant Previous and Ongoing Projects & Activities

2015-2016	local	Plznito (http://www.plzni.to) Application (web, mobile) for city residents. Reporting of issues and problems in the city (city infrastructure, furniture, lighting, waste, etc.)
2016	local	Online network reporting (https://gis.plzen.eu/vfe/) Web application for "builders" where they can get confirmation of city networks existence (metropolitan data network, public lighting, water, heating, transportation, etc.)
2015-2017	local	Open data portal (http://opendata.plzen.eu) Publishing of the city data sets (collection, metadata, control, publishing)
2014-2016	EU	Data warehouse City date warehouse – design, implementation

Role in the Project

Správa Informačních Technologií města Plzně is a pilot city in the project. Key focus is connected with an online visualization of main road construction impacts to the traffic in city Pilsen with possibility to coordinate it.

Macq SA (Macq)

	Macq SA (Belgium) Partner n° 12

Partner Introduction

Macq, is a Brussels based company founded in 1923 with about 70 employees. Macq uses “Traffic and Automation” as a baseline. About 30% of the company resources go into research and development. Macq develops both hard- and software. Macq has its own embedded camera system for Vehicle classification, Incident detection and License Plate Recognition.

We are also active in the traffic and mobility centre’s that handle the traffic information, the automatization of tunnels, bridges and locks (water transport). For automation in traffic and industrial applications Macq has its own PLC and SCADA product line. For the EBU (European Broadcasting Organization) we manage the equipment that controls the fibre and satellite transmission/reception.

Macq is working on combining its different traffic products into a smart mobility platform. This will be completed with new modules that go beyond the traditional traffic management. Data collection will be completed with mining of social media, pollution sensors and other none conventional sources of traffic related information. We will give strategic information such as road user satisfaction, damage to the road infrastructure, ... but also real time information about incidents that cannot easily be detected by classic sensors: flooding of local roads, traffic aggression, free petrol at a station because of malfunction of a pump, stolen bicycles, animals on the road, etc.

Key Personnel

Geert Vanstraelen (male) (Civil Engineer computer science KULeuven 1987, Civil Engineer industrial management KULeuven 1994) is head of the R&D. After being assistant at the KULeuven and working at Dolmen Engineering on embedded systems for automated petrol stations, Geert joined in 1992 the R&D department at Macq. He participated in several research projects, defining programming languages for PLC's and the open source SCADA project Open OBviews.

Mr Raman Vincent (male), Ingénieur civil mécanicien et électricien, Université Libre de Bruxelles. Vincent is Team Manager for Product Development .

Mr Benoît Van Bogaert (male), Ingénieur civil mécanicien et électricien, Université Libre de Bruxelles 1988 (I3), Ingénieur en Automatique, Université Libre de Bruxelles 1991. Ingénieur Backend, Expert en gestion de trafic et conception de système d'automation. Benoît started his career as a researcher at the ULB in a project that continued with Macq on the design of automatic controllers. After being a software developer at Eurocontrol he re-joined Macq in 2007. Benoît participated in projects on satellite broadcast equipment control, license plate handling and dynamic traffic management.

Relevant Publications and Products

1. iCar-CAM: An integrated camera system that captures vehicle registration plates both night and day. It is comprised of a digital image capture unit, an infrared light, a processing unit and different algorithms. iCAR-MANAGER is a software tool used to configure and operate iCAR systems.
2. TIM: Traffic Incident Management, gives traffic and technical operators the ability to quickly and effortlessly handle events occurring on their network and provides them with integrated and efficient interfaces to control their equipment and automate their tasks.
3. M3 (Pronounced M-cube): Smart Mobility Platform.

Relevant Previous and Ongoing Project & Activities

C-Mobile 01.05.2017 – 31.10.2021	H2020	Accelerating C-ITS Mobility Innovation and depLoyment in Europe. Large scale demonstrator with the focus on Vulnerable Road Users.
REVaMP² 01.11.2016 31.10.2019	ITEA	Round-trip Engineering and VAriability Management Platform and Process. In REVaMP2 we build upon our experience gained in the European VARIES project (1.05.2012 -30.04.2015). Traffic cameras are our use case in this project.
Radar multivoie 01.01.2014 - 31.12.2015 01.04.2016 31.03.2018	Innoviris	Multilane radar for measuring road traffic
ClassCam 01.09.2011 31.08.2013	Innoviris	Detailed classification of vehicles with video flow and depth sensors
LearningCam	Innoviris	Identification and detailed classification of vehicles on a road with artificial intelligence technology.

01.12.2009 -
31.03.2011

Role in the Project

Macqs product family allows to collect high quality big data with traffic road sensors and help the management of traffic centres and traffic infrastructure. Macq is not owner of the collected sensor data, our clients are. Our role in the project is twofold:

- Facilitate the data collection for other partners: sensors, data anonymization and storage.
- Based on strategic policies give hints for tactical operational decisions in traffic operation rooms.

For instance, evaluate how traffic congestion data correlated with variable message sign info and broadcasted information influences the inside choices of routing in an origin destination matrix. There is an added value if the outgoing data and incoming policies could be formulated in a standardized manner, allowing non-software people to combine policies and environmental context into tactical scenarios. For instance scenario to react on large traffic incidents or other extreme events that create the need to reroute traffic in a non-conventional manner.

Relevant infrastructure

- Macq is active in the road traffic centers of Antwerp, Gent and Brussels. We manage both traffic and road infrastructure.
- We installed ANPR cameras in a large number of Flemish cities.
- Lightning on Belgian highways.
- Counting data from the Paris ring road is collected by our equipment to determine and display journey times. Numerous counting loops are positioned throughout the Parisian ring road. All of this data is managed in real-time by Macq equipment. Almost 1,300 loops are distributed throughout this ring road. Loop detection provides vehicle passage contacts which are recorded in our systems. Note: we have realised the collection a lot of sensor data. We need the involvement and authorisation of our clients to use this data (to their benefit) in the project.

Plan4all z.s (P4A)

Plan4all	**Plan4all z.s** **(P4A)** (Czech Republic) Partner n° 13

Partner Introduction

Plan4all (http://www.plan4all.eu) is a non-profit international association for sustaining project results and open data related to regional, landscape and environmental planning. The association was set up during the Plan4business project (2012-2014) that developed an open data platform for aggregation, management and analysis of spatial planning information. This platform is now managed by the Plan4all association, which makes sure that data are easily accessible for reuse and the amount of data is increased.

The main aim of Plan4all is to build international community to offer open data for reuse in different specialisms including spatial planning, transport, agriculture and environment management. The Plan4all association is supported by members, but also by several EU projects operating in slightly different fields. SDI4Apps provides mainly means for accessing data by developers (APIs), OpenTransportNet specialises in the transport domain and related applications and FOODIE in the farming area. All projects contribute with data sources, especially building the following open datasets based on common standards: Open Transport Map, Open Land Use and Smart Points of Interest.

The members of Plan4all have different expertise in IT and GIT, data management, infrastructures in domains including spatial data harmonisation, data analysis and visualisation, web app and tool development, user engagement and business planning. The task of Plan4all is to guarantee sustainability of large Open Data sets harmonised on the base of principles of W3C, INSPIRE, GEOSS and Copernicus.

Key Personnel

Dr Tomáš Mildorf (male) Ph.D. (2012) in Geomatics, University of West Bohemia in Pilsen. Research activities: infrastructure for spatial information compliant with INSPIRE, model generalisation. Coordinator of large EU projects. Traineeship at the Joint Research Centre of the European Commission in Ispra (Italy) – Institute for Environment and Sustainability, Spatial Data Infrastructure Unit.

Dr Štěpán Kafka (male) Education – Charles University Prague, faculty of Natural Sciences, Degree(s) or Diploma(s) obtained – Doctor of Natural Sciences. Employed at VŠB – Technical University Ostrava, Faculty of

Mining and Geology, Institute of Economics and Control Systems. Membership of Czech Association for Geoinformation (CAGI), expert drafting team for INSPIRE, Representative of company in OGC. Project participation Wirelessinfo, Premathmod, SpravaDat, Plan4all, Habitats, Plan4business.

Dr Karel Jedlička **(male)** Ph.D. (2010) Geoinformatics, Technical University of Ostrava. Research activities: Global Positioning Systems (GPS), GIS, spatial analysis and modelling in ArcGIS, spatial databases, geomorphology. Traineeship at ESRI Redlands, CA (2003).

Relevant Publications

1. Mildorf, T., Camerata, F., Vico, F., Ombuen, S. Data interoperability for spatial planning: A tentative common description of European datasets concerning land use. In Urban and Regional Data Management. London: Taylor & Francis, 2011, s. 97-110.
2. Ježek, J. et al., 2013. The Plan4business Approach to Transfer Open Data into Real Estate Businesses. In J. Hřebíček et al., eds. Environmental Software Systems. Fostering Information Sharing. IFIP Advances in Information and Communication Technology. Springer Berlin Heidelberg, pp. 588–596.
3. Mildorf, T. Plan4all - Interoperability of Spatial Planning Information in the Context of the Infrastructure for Spatial Information in the European Community - INSPIRE. In INSPIRE, GMES and GEOSS Activities, Methods and Tools towards a Single Information Space in Europe for the Environment. Riga: Tehnoloģiju attīstības forums, 2009, s. 11-22.
4. Mildorf, T. et al., 2013. Plan4business - a service platform for aggregation, processing and analysis of urban and regional planning data. In International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences. pp. 41–44.

Relevant Previous and Ongoing Projects & Activities

2014-2017	EU CIP	Open Transport Net (OTN) The objective of OTN was to create a virtual service to aggregate, harmonize and visualize open transport-related data. The platform facilitates better transport control as well as development of new innovative transport applications and services. The solution is based on public data, location based services and data obtained by volunteers. The project unifies spatial geodata, dynamic data flows and non-spatial data using tools suitable to control large data sources, visualisation tools and sample detection algorithms. The project was verified in four pilot locations: the United Kingdom, Belgium, France and the Czech Republic (Liberec Region). http://opentnet.eu/
2014-2017	EU CIP	Uptake of open geographic information through innovative services based on linked data (SDI4Apps) The SDI4Apps project received funding from the Competitiveness and Innovation Framework Programme and the Czech Ministry of Interior. The project is focused on

		the use of open geographic information through innovative services based on Linked Data. The objective is to establish a platform and conditions to support development of innovative services and applications employing geographical data. http://sdi4apps.eu/
2012-2014	EU CIP	A service platform for aggregation, processing and analysis of urban and regional planning data (Plan4business) The heterogeneous nature of regional and urban planning data prevents integration and analysis of these data on the European and cross-border level. The ever-increasing requirements of the users – i.e. research institutions, regional and urban planners and real estate agencies – necessitate harmonisation of these data, making them available through website services and allowing for data analyses. The Plan4business project developed a platform that can be used as a catalogue of regional and urban planning data, and namely as an integrator enabling visualization and spatial analyses on the European and international level. http://www.plan4business.eu/
2009-2011	EU CIP	European Network of Best Practices for Interoperability of Spatial Planning Information (Plan4all) The Plan4all eContentplus project was mainly focused on the harmonization of regional and urban data planning in compliance with the INSPIRE directive. The project was based on existing best practices applied in the EU regions and cities and evaluation of results of existing research projects in this particular area.

Role in the Project

Plan4all as an umbrella organisation of currently 14 organisations, will secure through its members' collection of user requirements and needs of citizens, businesses and public authorities in terms of business, functional and operations requirements.

The Plan4all network will be exploited for dissemination and outreach activities to relevant communities. Plan4all will promote Public-Private-Partnership through its members from the public and private domains.

Significant infrastructure and/or any major items of technical equipment

- OTN platform demonstrator
- Plan4all Open Data repository

Politecnico di Milano (PoliMi)

POLITECNICO MILANO 1863	**Politecnico di Milano** **(PoliMi)** (Italy) Partner n° 14

Partner Introduction

The **Politecnico di Milano** was established in 1863 and is now ranked as one of the most outstanding European universities in Engineering, Architecture and Industrial Design. The alliances formed with other universities, centres of research and industries all over the world allow the Institution to improve constantly his performance in the domain of research and to contribute to the development of the European innovation. The project team at Politecnico di Milano will be a group of researchers belonging to the Department of Architecture and Urban Studies (DAStU) under **The Future Cities Challenges Lab** (**fccL**) composed by researchers in urban planning and policies. **fccL** develops several activities related to policy analysis and design with a special focus on public policies, governance models, and related innovation processes. Focused themes are also policies oriented to urban regions and their creation/development dynamics, as well as institutional innovation processes and decision making mechanisms within the framework of a European Urban Agenda. The involved staff has long experience in research and development projects. Specific competences of the **fccL** team that will serve the Geo-Visu project focuses onthe Urban Agenda (Urban@it), socio-digital innovation and participatory activities in urban policymaking and innovation governance. The **fccL** team is active in basic and applied research in different fields such as urban management and strategy making, social policy analysis, policy making and urban governance; participatory scenario building, co-design methodology and techniques, community driven design and planning. Specific experiences of **fccL** in connection with the study objectives are: urban and territorial transformations in contemporary society, territorial innovation and Living Lab, social policy and social innovation, spatial organization and dynamics, decision making processes for policy making and design. **fccL** is partner of the Italian University Association.

Key Personnel

Paola Pucci (female), is full professor in Urban planning and Research Director of the PhD course in Urban Planning Design and Policy (UPDP) at the Politecnico di Milano. Since 1995, she has taken part, also with roles of team coordinator, in national and international research projects funded on the basis of a competitive call (EU Espon Project, PUCA and PREDIT French projects), and dealing with Mobility policy and transport planning, mobile phone data and territorial transformations. Among the major researches on Mobility policy, transport planning: «Développement de TCSP sur rail et maîtrise de l'étalement urbain. Possibilités de densification des secteurs à proximité des lignes ferroviaires dans les franges de quatre régions urbaines», PREDIT (GO3) (2010-13); Mobility analysis for Sustainable Mobility Plan (financed by Provincia di Monza e Brianza 2011) ; Mobile Phone data analysis in Lombardia Region (financed by Telecom Italia, 2008 and 2011); Public Debate on Gronda Intermedia motorway project in Geova (2008-09) funded by Comune di Genova; ESPON (European Spatial Planning Observation Network) project 1.2.1. “Transport services and networks: territorial trends and basic supply of infrastructure for territorial cohesion” (2004); «Mobilité urbaine durable: les politiques publiques à l’aune des

indicateurs? Comparaison européenne sur le rôle des indicateurs de mobilité» Université Lumière Lyon 2 (financed by PUCA, 2005-2007). She is reviewer for the ESRC _Economic and Social Research Council. Shaping Society (Uk), on the topic "New and Emerging Forms of Data - Policy Demonstrator Projects", Phase 3 Big Data Network".

Grazia Concilio (female). Born in . She is an engineer and an associate professor in Urban Planning and Design; PhD in "Economic evaluation for Sustainability" from the University of Naples Federico II. She carried out research activity at the RWTH in Aachen, Germany (1995), at IIASA in Laxenburg, Austria (1998) and at the Concordia University of Montreal, Canada, (2002); she is reviewer for many international journals and member (in charge of LL new applications) of ENoLL (European Network of open Living Lab). Component of several research projects; responsible for a CNR research program (2001; the pilot of this project has been included as Territorial Living Lab in Enoll) and coordinator of a project funded by the Puglia Regional Operative Programme (2007-2008) and aiming at developing an e-governance platform for the management of Natural Parks (the project ended with the submission of Torre Guaceto Living Lab). She has been responsible for POLIMI of the Periphèria, MyNeighborhood|MyCity, and Open4Citiziens projects and responsible for DAStU of the SMART CAMPUS Project. She is also responsible for POLIMI of an ERASMUS+ project on Community Planning (2015-2017) and component of the ThinkingSmart project funded by Erasmus+ initiative.

Relevant Publications

1. **Pucci P.,** Colleoni M (eds) (2016), Understanding Mobilities for Designing Contemporary Cities, Springer. ISBN 978-3-319-22578-4
2. **Pucci P., Manfredini F.,** Tagliolato P. (2015), Mapping urban practices through mobile phone data, PoliMI SpringerBriefs Series, ISBN 9783319148328
3. **Manfredini F., Pucci P.**, Tagliolato P., (2014), Toward a systemic usage of manifold cell phone network data for urban analysis and planning, in Journal of Urban Technologies, n.21(2) pp. 39-59
4. **Concilio G.** (2016) Urban Living Labs: opportunities in and for planning. In: Concilio G., Rizzo F. (Eds.) Human Smart Cities. Rethinking the interplay between Design and Planning. Springer.
5. **Concilio G.**, Molinari F (2014) Urban living labs: learning environments for collective behavioural change. In Carlucci D., Spender JC., Schiuma G (Eds) Proceedings of the IFKAD 2014 conference, pp. 746-763.

Relevant Previous and Ongoing Projects & Activities

Mapping Urban Practices Through Mobile Phone Data (financed by Telecom Italia) 2008-2011: this project funded by Telecom Italia was aimed at exploring how new maps, based on unconventional data sources and better tailored to the dynamic processes in place, can represent spatialized practices and can give new insights for improving the effectiveness of urban policies.

My Neighbourhood | My City (FP 7 CIP-ICT-PSP-2012-6) 2013-2015: The My Neighbourhood solution combines new digital technologies and techniques, such as social gaming principles (gamification), with the Living Lab methodology to help strengthen existing ties and resolve communal issues in the real, day-to-day world of the neighbourhood. The solution is rooted in an open My Neighbourhood platform that 1) combines the data and functionality of existing Apps with new tools that connect people locally both on- and offline and 2) uses gamification to encourage people to get involved with their own neighbourhoods and engage their family and friends to do the same.

Open4Citizens (Horizon 2020) 2016-2018: Open4Citizens works to reduce the gap between the opportunities offered by the abundance of open data and the citizens' capability to imagine new ways of using such data. It

involves citizens into a co-design process (hackathons), together with IT experts, public administrations, interest groups and start-up companies, in order to develop new services to improve urban quality and certain aspects of their everyday life. The aim of the project is to raise citizens' awareness about the opportunity offered by open data and create a new culture of innovation in public services. In coherence with the project goals, urban policies for open data are also in the focus of the project as relevant to the rooting of data opening practices by local administrations.

ThinkingSmart (Erasmus+) 2016-2018: The **Smart specialisation** approach combines industrial, educational and innovation policies for countries/regions to identify and select a limited number of priority areas for knowledge-based investments, focusing on their strengths and comparative advantages. Smart specialisation processes need to be based on a strong partnership between businesses, public entities and Higher Education Institutions (HEIs), essential for success. The role of HEIs in smart specialisation strategies (RIS3) is a current challenge that the EC aims to tackle, in order to maximise the impact that HEIs may have in the design and implementation of successful RIS3. **Thinking Smart** (http://thinkingsmart.utad.pt/) sets out an innovative objective: support HEIs in contributing to and benefiting from Smart Specialisation strategies. It aims to address an issue that is of European interest through an innovative approach. **Its specific objectives are:** 1) identify successful and innovative ways in which HEIs have contributed to RIS3 in their strategic direction; 2) take part in a collaborative process to identify gaps and challenges regarding the role of HEIs for regional growth; 3) co-design a toolkit to support HEIs in improving their contribution to RIS3, ensuring it benefits their overall strategy; 4) develop a policy brief and actively engage policy-makers at regional, national and international levels; 5) create a support network to facilitate continuous best-practice exchange between all actors involved in RIS3.

Role in the Project

The **fccL** team of PoliMi in the GeoVisu projet will be in charge of the Policy Making and Modelling activities.

Stad Gent (Gent)

	Stad Gent **(Gent)** (Belgium) Partner n° 15

Partner Introduction

With more than 255,000 inhabitants, Ghent is the third largest city in Belgium. It offers a rare combination of an intimate compact city and the openness of a metropolis. It is a versatile city, historic and yet contemporary at the same time.

With numerous museums, cultural centers, festivals, monuments and the title of 'Unesco creative city of music', it is a genuine city of culture. Over 72,000 students make Ghent the largest student city in Flanders, including Ghent University that ranked 71 on the '2015 Academic Ranking of World Universities'. The young heart of the city boosts innovation and creativity. This is reflected by Ghent's economy and its commitment to the fields of biotech, cleantech, ICT, materials, logistics and health care. The city's seaport provides over 60,000 jobs and generates an added value of 6.7 billion euros. Numerous service companies, based in Ghent, are operating for the whole region, thus boosting the central function of Ghent. The City of Ghent itself employs more than 5,000 people in its administration.

Ghent has an explicit Open Data policy, and the Data & Information team will deploy its expertise to guarantee full compatibility and practicability of the developed solutions.

Key Personnel

Thimo Thoeye, Assistant Manager (, male) is a software engineer with a strong interest in open and linked data. As a civil servant and freelance advisor in open data, rooted in the open source community, he has a deep knowledge and understanding of public information systems and is a strong proponent of semantic web technology. He is an expert in public open data and its uses, has contributed to the Apps for Europe, Citadel… on the Move projects (CIP programme) and OASIS project (CEF Telecom) and is continuously looking for ways to make public open data used and useful for software developers.

Annelies Van Steenberge, (° , female) graduated at the University of Ghent as a master (Communication Sciences) and also obtained a degree in Informatics. Since 2007, she is working in the data-analysis team of the City of Ghent.

Els Bauwens (° , female) graduates at the University of Ghent as a master in sociology and also obtained a degree in demography at the University of Louvain-la-Neuve. Since 2008, she is working in the data-analysis team of the City of Ghent.

Karl-Filip Coenegrachts (male) is Master of Laws, specialized in European Law (Ghent University, 1996). From 1997 to 2000 he worked for the Federal Ministry of Justice as co-ordinator for the European Union, the UN and Schengen in the field of criminal legislation and home affairs. In 2001 he started in Ghent as political advisor of the Deputy Mayor responsible for personnel and IT. In that capacity he co-founded Digipolis, the intermunicipal organisation for ICT for the cities of Ghent and Antwerp, and Gentinfo, the first local government citizen service center in Europe. In 2004 he became head of department of Strategy, Co-ordination and International Relations of the City of Ghent and Chief Strategy Officer in 2015. He is responsible for the long term strategy of Ghent including the implementation of horizontal policies, smart city strategy, data & information management, international relations & networks and policy participation. His teams also co-ordinates all European funding programmes and projects in the city of Ghent. He is currently also expert of the Board of Directors of Digipolis and Ghent representative in the Executive Committee of Eurocities.

Krist Poffyn, Assistant Manager (° , male) graduated twice as a master, resp. at the University of Ghent (Classics), and the Catholic University of Louvain (Social Anthropology). After a 15 years' career in the social sector as a co-ordinator, planner and team leader in various organizations, he became a member of Ghent's International Relations team. Since 2009, he is involved in various EU-funded projects as a coordinator and has a wide experience in the preparation, follow-up and reporting on European projects in diverse funding schemes. Krist is currently working for the Strategic Funding unit of the City of Ghent.

Relevant Publications

- The City of Ghent open data portal: https://data.stad.gent/
- Annelies and Els are author and co-author of Migration trends (2014 and 2008), Ghent, a city for Ghenteneers and students (2012), and Omgevingsanalyse (environmental analysis) – Gentenaars en Gentgebruikers (Ghent citizens and non Ghent – citizens) (2013):
- Geostatistical presentation software (open data):
  - https://gent.buurtmonitor.be/dashboard/
  - https://gent.buuutmonitor.be
- Online visualisation of migration out and to the city of Ghent
  - http://stadsverlaters.stad.gent/home

Relevant Previous and Ongoing Projects & Activities

2016-2018	CEF Telecom	OASIS Open Applications for Semantically Interoperable Services: focussing on public transport data
2011-2014	CIP-ICT	Citadel...on the move: use Open Data to create Mobile Applications that make your city a better place to live

2010-2013	CIP-ICT-PSP	SMART-IP: Smart Metropolitan Areas Realised Through Innovation & People

2012-now	Omgevingsanalyse: Not registrated population of Ghent: in this study we want to make a assumption of the people who live in Ghent, but are not registrated in the Official Population Registration, e.g. students, homeless people, gypsies. To make the assumptions we search for supplementary registrations and sources.
2010-now	Member of user group Crossroad Bank for social security (datawarehouse): how to build useful data/information for the policymakers based on linking different registration sources.
2003-2015	Leefbaarheidsmonitor - mobiliteitsbevraging (Liveability monitor and mobility monitor) (2003- 2015): how to build data for policymakers if you don't have registration. The liveability and mobility monitor is based on a large survey on Ghent citizens. The result is a database with 4 moments: trends and shift of behavioural modification can be measured. Both monitors are built on the same methodology and geographic areas.

Role in the Project

The City of Ghent will co-develop and pilot the methodology within PoliVisu. It will plan and coordinate this process among the cities, and make sure that local requirements are met. To this end, the city will ensure that it engages the right resources, both involving the local decision makers, the experts in policy development, and the experts working on data management, statistical analysis and ICT solutions.

Expert group panel

PoliVisu consortium has appointed an external panel of experts (see letter of acceptance in the Annex). In this sense, the expert group panel is an independent group composed by experts chaired by the Project Coordinator (AIV) aiming to give guidelines and expert advices to the project in order to maximise the impact of the project results. The panel will be constituted by 6 independent members nominated by the Coordinator and it will meet at least once a year by participating in the General Assembly. The nomination of the members of the group has been done in accordance with the principles of best value for money and avoiding conflicts of interest. A change in the membership of the experts group should be notified to the European Commission as it may require an amendment to the GA.

The Project Coordinator will make sure that the conclusions of the experts are adequately taken into consideration in the decision-making process during the project. Members of the panel will also be consulted individually on special aspects.

The expert group panel responsibilities include:

- overseeing quality of project deliverables, when required;
- advising and assistance on the dissemination, international discussion and promotion of project results;
- securing loyalty toward the project and confidentiality regarding unpublished project deliverables and drafts.

PoliVisu's expert group panel is composed by the following professionals:

Maria Wimmer (female). Ms Wimmer chairs the research group eGovernment at the Institute for Information Systems Reserach. Her main research and teaching focus are e-government and e-democracy/e-participation, systems analysis, systems design in terms of modelling and managing information and interoperation, processes and knowledge in a comprehensive way based on a holistic perspective. With her research group, she is involved in diverse EC-(co-)funded research and implementations projects in e-government and e-participation: Brite, Crossroad, Demo_net, ESTrain2, eGovPoliNet, among others.

Pieter Ballon (male). Prof. Dr. Pieter Ballon is the Director of the research group SMIT (Studies on Media, Innovation and Technologies). He was appointed the first Brussels Smart City Ambassador and is also the International Secretary of the European Network of Living Labs. Prof. Ballon holds a PhD in Communication Sciences and an MA in Modern History. Since 2009 he's taught Communication Sciences at the VUB (Free University of Brussels). His expertise lie in the Smart City area for both Brussels and the Flanders Region, on the subject of which he has published the book "Smart Cities : hoe technologie onze steden leefbaar houdt en slimmer maakt" (http://www.lannoo.be/smart-cities)

Yannis Charalabidis (male). Mr. Charalabidis is Associate Professor in the University of Aegean, in the area of eGovernance Information Systems, coordinating policy making, research and pilot application projects for governments and enterprises worldwide. He is the Director of Innovation and Entrepreneurship Unit and the Head of the Information Systems Laboratory of the University of the Aegean. He also serves as member of the board in the Greek Interoperability Centre, a centre of excellence in eBusiness and eGovernment, hosted at the National Technical University of Athens. During the last 20 years he has been the coordinator or technical leader in numerous FP6, FP7, eInfrastructures and National research projects in the areas of eBusiness and eGovernment. He has been a contributing member in several standardisation and technology policy committees. He researches, writes and teaches on Open Government Service Systems, Enterprise Interoperability, Government Transformation and Citizen Participation in the University of the Aegean and several universities in

Europe and the US. He has published more than 200 papers in scientific journals and conferences and he has been listed as the 8th most prominent author in the field of Electronic Government, among 9000 scholars, in 2016.

Andrew Stott (male). Mr. Stott has worked as a Senior Civil Servant in the UK Civil Service from 1976 to 2010, working in a number of different Ministries. During this time, he had a variety of policy making, policy communication and policy implementation roles, including Policy Co-ordinator for the whole of social security system and Director of Modernisation in the department for transport. In his final cross-government role he was responsible to the Prime Minister for the programme to design and implement new, online, consultation methods for policy co-creation and legislative reform and for the use of social media to engage with citizen on policy design and public service delivery. Since leaving the UK Civil Service, he has worked as an expert advisor on the use of government data and the application of new technology to government services, including the EU-funded Citadel and Open Transport Network projects

Bart de Lathouwer (male). Bart De Lathouwer is responsible for planning and managing interoperability initiatives such as testbeds, pilots and interoperability experiments with an emphasis on activities in Europe. Since 2001, Mr. De Lathouwer has worked first as European liaison to the geospatial division of Autodesk and later as Autodesk's Product Manager for Server Technologies. In this role, he also served as member company representative to the OGC. As a company representative, he started the OGC CAD-GIS Interoperability Working Group (which evolved into the OGC 3DIM Domain Working Group) and managed the development of a core data access technology FDO (Feature Data Object) that later went open source in OSGeo. After returning to Europe, he worked as a geospatial expert for both private and government organizations focused on interoperability.

Eddy van der Stock (male) as expert in international network implementations cities will take part of the panel. He is master in science (MsC) in public management and is specialised in information security and data models and structures. In 2008, he became president/chairman of V-ICT-OR, the Flemish Organisation for ICT responsible in Local Authorities. His concern is bringing various level of government together puts him in a lot of different think-tank's and cooperative working groups. His broad perspective on e-government has taken him to an international empirical as well as academic journey into the world of reference architectures where his visionary, creative and pragmatic skills build strong relationships across the several involved organisations.

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

Does the participant plan to subcontract certain tasks (please note that core tasks of the project should not be sub-contracted)	Yes
The tasks of the expert panel will be subcontracted (see section 3.4.3 for details)	
Does the participant envisage that part of its work is performed by linked third parties	Yes
All grants and expenses of AIV, the coordinator, will be managed through EVIV (the AIV's linked third party). A new EVIV's bank account had been set up that will solely be used for this project. This will facilitate both the management and accountability for the project.	
Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Grant Agreement)	No

Section 5: Ethics and Security

5.1 Ethics

PoliVisu project focuses on delivering the tools in a big data-driven policy-making and consultation process to enhance the quality and agility of policy making from a high-level policy decision to an operational day-to-day decision implementation level. Moreover, PoliVisu will concentrate to visualise the policy effects in an advanced way, that is, policymakers and the public will see the expected outcome of the proposed policy and can also test several scenarios. During the project, the co-creation process will be tested in four pilots dealing with the policy creation and implementation of visible and tangible policies in the transport and mobility field.

The risks of ethical violations are low. Participants of the project will conduct all work respecting the principles of the Charter of Fundamental Rights of the European Union, which covers issues of dignity, freedom, equality, solidarity, citizens' rights and justice. The project will comply with Article 8 of the European Human Rights Convention.

All partners will conform to relevant EU legislation - The Charter of Fundamental Rights of the EU and Directive 95/46/EC of the European Parliament and the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data - and national legislation. In particular, researchers will consider the sensitive implications of their proposals in terms of respecting privacy, inclusiveness and autonomy. The project and the proposed work will ensure that all material and data will be used with the utmost confidentiality and dignity, and thus no risk, nor harm to third parties is caused. Researchers will comply with national and European Union legislation, respect international conventions and declarations and take into account the opinions of the European Group on ethics.

Informed consent will be sought whenever ICT research involves volunteers in interviews and the project will ensure that subjects have the information they need specifying the alternatives, risks, and benefits for those involved in ways that they understand. The participants in pilots (subjects) will be adult healthy volunteers. None of the methodologies and technologies intended to be used are known to inflict any psychological damage on participants. Great care will be taken that the experiment itself will not contain any elements that may harm or threaten the participant, either physically or psychologically. Protection of humans is the primary imperative and, in addition to legal and ethical standards, individual investigators' commitment to the protection of research participants should not be underestimated. Without their volunteer participation in research, it is not possible to gather the knowledge needed to advance science and technology. Participants will be debriefed after the experiments. The investigations included in the project are not medical examinations and do not warrant conclusions on any potential diseases.

Informed consent.

In order to ensure an informed consent procedure that is in line with international standards of research ethics, recruitment of participants will be performed as a two-stage process.

Privacy.

With regard to managing personal data, **PoliVisu** will treat the data as confidential and will take every precaution to guarantee the privacy to participants, i.e., ensuring that personal data will be appropriately anonymised and be made inaccessible to third parties.

When analysing the data, researchers will use digital data files with no identification data (a participant number will be used for data-linkage purposes). These files will be stored on special domains within the participating organisations' network architectures. Only the researchers involved in the project will have access to this password protected storage area. At the end of the project (or earlier, if possible), all questionnaires and identification data file will be destroyed. That is, the remaining digital data files will be such that the participants (data subjects) can no longer be identified. All researchers participating in the project will undersign a nondisclosure agreement concerning the personal data of the participants. Before the actual experiments, each project partner will draw up a description of the scientific research data file and will keep this description available to anyone. These procedures comply with the aforementioned EU and national legislation.

Inclusiveness.

The contents developed and used in the project will be compliant to the W3C Content accessibility guidelines. The guidelines discuss accessibility issues and provide accessible design solutions. They address typical scenarios that may pose problems for users with certain disabilities.

Actions.

In order to follow-up the ethical aspects of the project, the consortium will nominate a person in charge of this: The "ethics manager" appointed will be Mr. Geert Mareels, member of the Flemish Privacy Commission.

Ethical issues will be explicitly reported on in the respective periodic reports (end of period 1 and 2).

Ethics Requirements

The following measures will be taken during the project to fulfill the EC's four ethics pre-grant (no. 1,2,3,5) and post-grant (no. 4 and 6) requirements:

Requirement 1: Humans

Details on the procedures and criteria that will be used to identify/recruit research participants must be provided. More specific information on the nature of the research on human participants should be provided.

As described in the Methodology (1.3.2) to select research participant's a thorough desk research will be performed by the project team. Its aim will be to identify and invite the most relevant actors in both civil service and non-government camps that have the best understanding of and greatest influence on big data driven policymaking. After selecting candidates for the interviews, the interviewees would then be approached by email and telephone.

Requirement 2: Humans

Detailed information must be provided on the informed consent procedures that will be implemented for the participation of humans. Also, the participants should be informed about what happens to their data if they decide to withdraw from the research before the end of the project.

Researchers conducting Expert Lens Interviews will follow a step-by-step protocol to guide them through the process. The protocol will adhere to the common norms and rules of qualitative research such as informed consent, participant rights and confidentiality. All the users included in the different trials will sign an informed consent in which they will be duly informed about how their personal data will be treated.

Requirement 3: Humans

Templates of the informed consent forms and information sheet must be submitted.

These forms will be drawn up at the very beginning of the project and will be submitted immediately. Basically they will contain the information and procedures listed above.

Requirement 4: Protection of personal data

Copies of opinion or confirmation by the competent Institutional Data Protection Officer and/or authorization or notification by the National Data Protection Authority must be obtained and submitted upon request (which ever applies according to the Data Protection Directive (EC Directive 95/46, currently under revision, and the national law). (see D1.1)

Requirement 5: Protection of personal data

Detailed information must be provided on the procedures that will be implemented for data collection, storage, protection, retention and destruction and confirmation that they comply with national and EU legislation.

More specifically, please provide details on the type of data collected, the retention period, and whether it will be destroyed at the end of the project.

A special effort will be made to collect as little restricted and personal data as possible. All data will be handled only by qualified researchers under strict confidentiality agreements, who will ensure that data access, data protection and privacy standards are in compliance with national and European regulations. All the users included in the different trials will sign an informed consent in which they will be duly informed about how their personal data will be treated. Should any sensitive data be obtained during the project, the project will see to it that it be made anonymous and rigorously protected for the duration of the action and destroyed at the conclusion.

The personal data are basically identification, profession and the opinions and answers given by the participants.

Data used in the project tools (Big Data, Open data) will be subject of a paper analyzing the potential conflict with respect to privacy. The big data can be categorized in levels of (personal) detail. Ways to anonymize data will be proposed (task 3.2 in WP3) and for each level of anonymization the achievable analytics use cases will be listed.

When processing personal data, the consortium will comply with the Data Protection principles which are set out in the Directive 95/46/EC and its revision (European Parliament legislative resolution of 12 March 2014 on the proposal for a regulation of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation)**.**

Requirement 6: Protection of personal data

Before the beginning of an activity raising an ethical issue, the applicant must confirm that any ethics committee opinion required under national law has been obtained, and is kept on file (see D1.2).

5.2 Security[33]

Please indicate if your project will involve:

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

[33] See article 37 of the Model Grant Agreement

6. Annex: Expert Panel Letters.

Prof. Maria Wimmer

Prof. Dr. Wimmer, iwvi. Uni Koblenz. Postfach 201602. D-56016 Koblenz

To whom it may concern

U N I V E R S I T Ä T KOBLENZ - LANDAU
Fachbereich 4: Informatik
Institut f. Wirtschafts- und Verwaltungsinformatik
Forschungsgruppe Verwaltungsinformatik

Prof. Dr. Maria A. Wimmer

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E-Mail: wimmer@unFkoblenz.de
http://www.uni-koblenz.de/aqvinf/

Koblenz, 27^{1h} January 2017

Agreement to serve as Expert in the PoliVisu Expert Group

Dear Coordinator,

I'm pleased to accept your offer to be a member of the “Expert Group” of the PoliVisu project in case the proposal, that will be submitted under the CO-CREATION-06-2017 call of EI2020, is accepted by the European Commission.

I understood that my effort for this assignment will be about 20 days for meetings and review of deliverables over the 3-year time-period of the project. My input will be focussed on work package 2 (Policy modelling methodology), 5 (Pilot definition) and 6 (Evaluation).

I understood that there will be a maximum budget of 15.000 euro per expert plus travel costs. My efforts will be considered as “subcontracting” under the Coordinator's budget. I agree that my invoices will be paid based on timesheets and proof of expenses when applicable.

In annex you find my short resume relevant for this assignment.

Best regards,
Prof. Dr. Maria A. Wimmer

Prof. Pieter Ballon

VRIJE
UNIVERSITEIT
BRUSSEL

ons kenmerk	contactpersoon	datum
	Pieter Ballon,	26/01/2017

CO-CREATION proposal PoliVIsu Dear

Coordinator,

I'm pleased to accept your offer to be member of the "Expert Group" of the PoliVisu project in case the proposal, that will be submitted under the "COCREATION-06-2017" Is accepted by the European Commission.

I understood that my effort for this assignment will be about 5 days per project year for meetings and review of deliverables for the 3-year time-period of the project. My input will be focussed on work package 2 (Policy modelling methodology), 5 (Pilot definition) and 6 (Evaluation).

I understood that there will be a maximum budget of 15.000 euro per expert plus travel costs. My efforts will be considered as "subcontracting" under the Coordinators budget. I agree that my invoices will be paid based on timesheets and proof of expenses when applicable.

In annex you find my short resume relevant for this assignment.

Best regards,

PIETER BALLON Director
imec-smit-vub

Pleiniaan 2 • 1050 Brussel. lei. +32 (0)2 629 21 11 • BTW BE 0449 012 406 * www.vub.ac.be

Prof. Yannis Charalabidis

Infomiation Systems Laboratory
Department of Information and Communication Systems Engineering
University of the Aegean

Samos. Greece January 24. 2017

To: PoliVisu Proposal Coordinator

Dear Coordinator,

I'm pleased to accept your offer to be member of the "Expert Group" of the PoliVisu project in case the proposal, that will be submitted uuder the "CO-CREATION-06-2017" is accepted by the European Commission.

I understood that my effort for this assignment will be about 20 days for meetings and review of deliverables over the 3-year time-period of the project. My input will be focussed on work package 2 (Policy modelling methodology). 5 (Pilot definition) and 6 (Evaluation).

I understood that there will be a budget of 15.000 euro per expert plus travel costs. My efforts will be considered as "subcontracting" under the Coordinators budget. I agree that my invoices will be paid based on timesheets and proof of expenses when applicable.
In annex you find my short resume relevant for this assignment.

Best regards.

Yannis Charalabidis
Associate Professor. University of the Aegean

UNIVEJtSmr OF THE AEGEAN ! DEPARTMENT OF INFORMATION AND COMMUNICATION SYSTEMS ENGINEERING S3200,
KARIOVASE SAMOS | TeL +30-2273042000 | Fax +30 22730-S2209 | rarxsdaegeangr

Andrew Stott

PO Box 191
Sevenoaks
Kent TN13
2AW
26 January 2017

Project Co-ordinator PoliVisu Project

Dear Coordinator

I am pleased to accept your offer to be member of the "Expert Group" of the PoliVisu project in case the proposal, that will be submitted under the "COCREATION-06-2017", is accepted by the European Commission.

I understood that my effort for this assignment will be about 20 days for meetings and review of deliverables over the 3-year time-period of the project. My input will be focussed on work package 3 (Big Data Analytics and Visualisation Components), 4 (Components Integration) and 6 (Evaluation).

I understood that there will be a maximum budget of 15 thousand euro per expert plus travel costs. My efforts will be considered as "subcontracting" under the Coordinators budget. I agree that my invoices will be paid based on timesheets and proof of expenses when applicable.

Attached you will find my short resume of experience relevant for this assignment. *Best*

regards,
A C STOTT

Bart De Lathouwer

OGC

Making Location C ount

Open Geospatial Consortium (Europe), Limited 1st Floor, 236 Gray's Inn Road London, WC1X 8HB, England www.opengeospatial.org

London, 24 January 2017

Dear Hugo Kerschot Coordinator of
the PoliVisu project

I'm pleased to accept your offer to be member of the "Expert Group" of the PoliVisu project in case the proposal, that will be submitted under the "CO-CREATION-06-2017" is accepted by the European Commission.

I understood that my effort for this assignment will be about 20 days for meetings and review of deliverables over the 3-year time-period of the project. My input will be focussed on the taks "Standardisation" in work package 7 (Dissemination, Exploitation and Standardisation).

I understood that there will be a maximum budget of 15.000 euro per expert plus travel costs. My efforts will be considered as "subcontracting" under the Coordinators budget. I agree that my invoices will be paid based on timesheets and proof of expenses when applicable.

The OGC is a non-profit, international, voluntary consensus standards organization that is leading the development of standards for geospatial and location based services. The (currently) 500 member organizations (companies, government agencies and universities) participate in OGC consensus processes, providing a venue to deploy the results of research to "geo-enable" the Web, wireless and location-based services, and mainstream IT.

Yours faithfully,

Eddy Van der Stock

LOLAj
l

Linked Organisation of
Local Authority ICT Societies

Lokeren, 26/01/2017

Dear Coordinator

m pleased to accept your offer to be member of the Expert Group of the PoliVisu project in case the proposal, that will be submitted under the CO-CREATION-06-2017 is accepted by the European Commission.

understood that my effort for this assignment will be about 20 days for meetings and review of deliverables over the 3-year time-period of the project. My input will be focussed on work package 5 (Pilot definition) and 7 (Dissemination, Exploitation and Standardisation).

I understood that there will be a maximum budget of 15.000 euro per expert plus travel costs. My efforts will be considered as subcontracting under the Coordinators budget. I agree that my invoices will be paid based on timesheets and proof of expenses when applicable

In annex you find my short resume relevant for this assignment.

Yours sincerely

Eddy Van der Stock
President - Linked Organisation of Local Aythorties (LOLA npo)
President-Vlaamse ICTOrganisatie (V-ICT-OR vzw)

- Linked Organisation of Local Authorities

L.O.L.A. npo
Mosten 13
9160 Lokeren
Belgium Account
http://lola-ict.org/

Company nr. 0504.852.633
Argenta bank
BE38 9730 8613 9872
3 C ARSPBE2

ESTIMATED BUDGET FOR

	Estimated eligible[1] costs (per budget category)						
	A. Direct personnel costs				B. Direct costs of subcontracting	C. Direct costs of fin. support	D. Other direct costs
	A.1 Employees (or equivalent) A.2 Natural persons under direct contract A.3 Seconded persons [A.6 Personnel for providing access to research infrastructure]		A.4 SME owners without salary A.5 Beneficiaries that are natural persons without salary				D.1 Travel D.2 Equipment D.3 Other goods and services D.4 Costs of large research infrastructure
Form of costs[6]	Actual	Unit[7]	Unit[8]		Actual	Actual	Actual
	(a)	Total (b)	No hours	Total (c)	(d)	(e)	(f)
1. AIV	353600.00	0.00	0	0.00	90000.00	0.00	51000.00
- EVIV[14]	0.00	0.00	0	0.00	0.00	0.00	0.00
Total beneficiary 1	353600.00	0.00			90000.00	0.00	51000.00
2. ISP	159500.00	0.00	0	0.00	0.00	0.00	15000.00
3. EDIP	58890.00	0.00	0	0.00	0.00	0.00	15000.00
4. ISSY	247200.00	0.00	0	0.00	0.00	0.00	15000.00
5. HSRS	137280.00	0.00	0	0.00	0.00	0.00	15000.00
6. GEOS	279900.00	0.00	0	0.00	0.00	0.00	15000.00
7. INCO	128000.00	0.00	0	0.00	0.00	0.00	15000.00
8. CZD	172900.00	0.00	0	0.00	0.00	0.00	15000.00
9. 21C	195250.00	0.00	0	0.00	0.00	0.00	15000.00
10. ATC	178800.00	0.00	0	0.00	0.00	0.00	15000.00
11. SITMP	101760.00	0.00	0	0.00	0.00	0.00	15000.00
12. MACQ	164260.00	0.00	0	0.00	0.00	0.00	15000.00
13. P4A	140400.00	0.00	0	0.00	0.00	0.00	15000.00
14. POLIMI	169520.00	0.00	0	0.00	0.00	0.00	15000.00
15. GENT	305900.00	0.00	0	0.00	0.00	0.00	15000.00
Total consortium	2793160.00	0.00		0.00	90000.00	0.00	261000.00

ESTIMATED BUDGET FOR

(1) See Article 6 for the eligibility conditions
(2) The indirect costs covered by the operating grant (received under any EU or Euratom funding programme; see Article 6.5.(b)) are ineligible under the GA. Therefo
grant (see Article 6.2.E).
(3) This is the theoretical amount of EU contribution that the system calculates automatically (by multiplying all the budgeted costs by the reimbursement rate). This t
(4) The 'maximum grant amount' is the maximum grant amount decided by the Commission/Agency. It normally corresponds to the requested grant, but may be lower
(5) Depending on its type, this specific cost category will or will not cover indirect costs. Specific unit costs that include indirect costs are: costs for energy efficiency
(6) See Article 5 for the forms of costs
(7) Unit : hours worked on the action; costs per unit (hourly rate) : calculated according to beneficiary's usual accounting practice
(8) See Annex 2a 'Additional information on the estimated budget' for the details (costs per hour (hourly rate)).
(9) Flat rate : 25% of eligible direct costs, from which are excluded: direct costs of subcontracting, costs of in-kind contributions not used on premises, direct costs of
(10) See Annex 2a 'Additional information on the estimated budget' for the details (units, costs per unit).
(11) See Annex 2a 'Additional information on the estimated budget' for the details (units, costs per unit, estimated number of units, etc)
(12) Only specific unit costs that do not include indirect costs
(13) See Article 9 for beneficiaries not receiving EU funding
(14) Only for linked third parties that receive EU funding

ANNEX 2a

ADDITIONAL INFORMATION ON THE ESTIMATED BUDGET

Unit cost for SME owners/natural beneficiaries without salary

1. Costs for a *[*SME owner*]/[*beneficiary that is a natural person*]* not receiving a salary

Units: hours worked on the action

Amount per unit ('hourly rate'): calculated according to the following formula:

{{ EUR 4,650 / 143 hours}
multiplied by
{country-specific correction coefficient of the country where the beneficiary is established}

Country-specific correction coefficient (in force at the time of the call):

EU Member States

country	coefficient	country	coefficient	country	coefficient	country	coefficient	country	coefficient
AT	104.8%	DK	135.3%	HR	97.5%	LV	75.9%	SE	111.7%
BE	100.0%	EE	78.3%	HU	76.2%	MT	89.6%	SI	86.1%
BG	71.5%	EL	92.7%	IE	113.5%	NL	104.3%	SK	82.6%
CY	91.8%	ES	97.6%	IT	106.7%	PL	76.4%	UK	120.3%
CZ	83.8%	FI	116.6%	LT	73.1%	PT	89.1%		
DE	98.8%	FR	111.0%	LU	100.0%	RO	68.3%		

H2020 associated countries

country	coefficient	country	coefficient	country	coefficient	country	coefficient	country	coefficient
AL	76.1%	FO	134.1%	LI	110.0%	MK	68.4%	TR	86.6%
BA	73.6%	IL	108.7%	MD	61.1%	NO	131.9%		
CH	113.1%	IS	116.6%	ME	66.9%	RS	67.1%		

Other countries

country	coefficient	country	coefficient	country	coefficient	country	coefficient	country	coefficient
AM	89.9%	CU	83.8%	JP	115.9%	NI	57.3%	TJ	64.9%
AO	114.6%	CV	76.4%	KE	78.1%	NP	73.5%	TL	78.3%
AR	58.5%	DJ	93.4%	KG	83.1%	NZ	94.1%	TN	70.5%
AU	105.0%	DO	66.9%	KH	70.5%	PA	57.0%	TO	85.0%
AZ	93.0%	DZ	81.7%	KR	105.2%	PE	75.5%	TT	74.1%
BB	116.6%	EC	68.8%	KZ	100.2%	PG	83.0%	TW	83.6%
BD	47.2%	EG	48.6%	LA	77.7%	PH	65.8%	TZ	65.2%
BF	93.8%	ER	61.2%	LB	86.4%	PK	49.4%	UA	92.3%
BJ	92.6%	ET	85.2%	LK	61.6%	PS	100.4%	UG	65.7%
BM	151.5%	FJ	68.1%	LR	100.1%	PY	71.9%	US	99.4%
BO	51.3%	GA	113.1%	LS	56.7%	RU	115.5%	UY	75.3%
BR	92.0%	GE	89.5%	LY	60.0%	RW	87.3%	UZ	51.4%
BW	55.3%	GH	68.2%	MA	83.5%	SA	84.8%	VE	70.0%
BY	65.0%	GM	67.7%	MG	80.0%	SB	93.3%	VN	51.1%
BZ	75.3%	GN	60.4%	ML	90.4%	SD	65.1%	VU	112.6%
CA	86.4%	GT	78.8%	MR	64.5%	SG	102.5%	WS	75.8%
CD	127.6%	GW	102.7%	MU	72.7%	SL	85.2%	XK	58.6%
CF	114.3%	GY	58.9%	MW	76.0%	SN	86.2%	YE	68.1%
CG	124.9%	HK	93.8%	MX	70.4%	SR	50.6%	ZA	55.8%
CI	102.0%	HN	69.0%	MY	71.6%	SV	74.3%	ZM	66.4%

CL	67.1%	HT	108.7%	MZ	71.6%	SY	74.8%	ZW	47.2%
CM	103.3%	ID	75.3%	NA	68.3%	SZ	56.8%		
CN	85.0%	IN	52.8%	NC	128.9%	TD	125.3%		
CO	76.6%	JM	94.9%	NE	87.9%	TG	88.7%		
CR	76.7%	JO	75.5%	NG	92.4%	TH	65.0%		

[additional OPTION for beneficiaries/linked third parties that have opted to use the unit cost (in the proposal/with an amendment): For the following beneficiaries/linked third parties, the amounts per unit (hourly rate) are fixed as follows:

- Beneficiary/linked third party [short name]: EUR [insert amount]
- Beneficiary/linked third party [short name]: EUR [insert amount]

[same for other beneficiaries/linked third parties, if necessary] *]*

Estimated number of units: see Annex 2

Energy efficiency measures unit cost

[OPTION if specific unit cost applicable to the grant: 2. Costs for energy efficiency measures in buildings

Unit: m^2 of eligible 'conditioned' (i.e. built or refurbished) floor area

Amount per unit*: see (for each beneficiary/linked third party and BEST table) the 'unit cost table' attached

* Amount calculated as follows:
{EUR 0.1 x estimated total kWh saved per m per year x 10}

Estimated number of units: see (for each beneficiary/linked third party and BEST table) the 'unit cost table' attached

Unit cost table (energy efficiency measures unit cost)[1]

Short name beneficiary/linked third party	BEST No	Cost Amount per unit	Estimated No of units	Total unit cost (cost per unit x estimated no of units)

]

Research infrastructure unit cost

[OPTION if specific unit cost applicable to the grant: 3. Access costs for providing trans-national access to research infrastructure

Units[2]: see (for each access provider and installation) the 'unit cost table' attached

[1] Data from the 'building energy specification table (BEST)' that is part of the proposal and Annex 1.

Amount per unit*: see (for each access provider and installation) the 'unit cost table' attached

* Amount calculated as follows:

average annual total access cost to the installation (over past two years[3])
average annual total quantity of access to the installation (over past two years[4])

Estimated number of units: see (for each access provider and installation) the 'unit cost table' attached

Unit cost table (access to research infrastructure unit cost)[5]

Short name access provider	Short name infrastructure	Installation		Unit of access	Amount per unit	Estimated No of units	Total unit cost (cost per unit x estimated no of units)
		No	Short name				

]

Clinical studies unit cost

[OPTION if specific unit cost is applicable to the grant: 4. Costs for clinical studies

Units: patients/subjects that participate in the clinical study

Amount per unit*: see (for each clinical study and beneficiary/linked third party) the 'unit cost table' attached

Estimated number of units: see (for each clinical study and beneficiary/linked third party) the 'unit cost table' attached

* Amount calculated, for each task described in the protocol, as follows:

{Task 1
{unit cost component 'personnel costs'
+ unit cost component 'costs of consumables'
+ unit cost component 'costs of medical equipment'
+ unit cost component 'costs of other specific services'
+ unit cost component 'indirect costs'}
+ Task 2
{unit cost component 'personnel costs'
+ unit cost component 'costs of consumables'
+ unit cost component 'costs of medical equipment'
+ unit cost component 'costs of other specific services'

---

[2] Unit of access (e.g. beam hours, weeks of access, sample analysis) fixed by the access provider in proposal.

[3] In exceptional and duly justified cases, the Commission/Agency may agree to a different reference period.

[4] In exceptional and duly justified cases, the Commission/Agency may agree to a different reference period.

[5] Data from the 'table on estimated costs/quantity of access to be provided' that is part of the proposal and Annex 1.

+ unit cost component 'indirect costs'}
[same for all other tasks]**}**

Unit cost components calculated as follows:

Unit cost component '**personnel costs**' (i.e. 'personnel costs of doctors' + 'personnel costs of other medical personnel' + 'personnel costs of technical personnel')

For unit cost component 'personnel costs of doctors':

{'average hourly cost for doctors', i.e.:
certified or auditable total personnel costs for doctors for year N-1
/
{1720 * number of full-time equivalent for the personnel category doctors for year N-1}
multiplied by
estimated number of hours worked by doctors for the task (per patient/subject)**}**

For unit cost component 'personnel costs of other medical personnel':

{'average hourly cost for other medical personnel', i.e.:
certified or auditable total personnel costs for other medical personnel for year N-1
/
{1720 * number of full-time equivalent for the personnel category other medical personnel for year N-1}
multiplied by
estimated number of hours worked by other medical personnel for the task (per patient/subject)**}**

For unit cost component 'personnel costs of technical personnel':

{average hourly cost for technical personnel, i.e.:
certified or auditable total personnel costs for technical personnel for year N-1
/
{1720 * number of full-time equivalent for the personnel category technical personnel for year N-1}
multiplied by
estimated number of hours worked by technical personnel for the task (per patient/subject)**}**

'total personnel costs' means actual salaries + actual social security contributions + actual taxes and other costs included in the remuneration, provided they arise from national law or the employment contract or equivalent appointing act

Unit cost component '**costs of consumables**' (i.e. 'costs of consumables category 1 + 'costs of consumables category 2' + 'costs of consumables category 3', etc)

For each category of consumables:

{'average price per item', i.e.:
{certified or auditable total costs of purchase of the consumables in year N-1 for the category of consumables concerned
/
total number of items purchased in year N-1 for the category of consumables concerned}
multiplied by
estimated number of items used for the task (per patient/subject)**}**

'total costs of purchase of the consumables' means total value of the supply contracts (including related duties, taxes and charges such as non-deductible VAT) concluded by the beneficiary for consumables delivered in year N-1, provided the contracts were awarded according to the principle of best value-for-money and without any conflict of interests

Unit cost component '**costs of medical equipment**' (i.e. 'costs of medical equipment category 1' + 'costs of medical equipment category 2' + 'costs of medical equipment category 3', etc.)

For each category of medical equipment:

{'average cost of depreciation and directly related services per unit of use', i.e.:

{certified or auditable total depreciation costs in year N-1 for the category of equipment concerned + certified or auditable total costs of purchase of services in year N-1 for the category of equipment concerned}
/
total capacity in year N-1
multiplied by
estimated number of units of use of the equipment for the task (per patient/subject)**}**

'total depreciation costs' means total depreciation allowances as recorded in the beneficiary's accounts of year N-1 for the category of equipment concerned, provided the equipment was purchased according to the principle of best value-for-money and without any conflict of interests + total costs of renting or leasing contracts (including related duties, taxes and charges such as non-deductible VAT) in year N-1 for the category of equipment concerned, provided they do not exceed the depreciation costs of similar equipment and do not include finance fees

Unit cost component '**costs of other specific services**' (i.e. 'costs of contracts for specific service 1' + 'costs of contracts for specific service 2' + 'costs of contracts for specific service 3', etc.)

For each category of specific service:

'average cost of a specific service per patient or subject', i.e.:
certified or auditable total costs of purchase of a service in year N-1 for the category of specific services necessary for the conduct of clinical studies
/
total number of patients or subjects included in the clinical studies for which the specific service was delivered in year N-1

'total costs of purchase of a service' means total value of the contracts concluded by the beneficiary (including related duties, taxes and charges such as non-deductible VAT) for the specific service delivered in year N-1 for the conduct of clinical studies, provided the contracts were awarded according to the principle of best value-for-money and without any conflict of interests

Unit cost component '**indirect costs**'

{25%
multiplied by
{unit cost component 'personnel costs' + unit cost component 'costs of consumables' + unit cost component 'costs of medical equipment'}**}**

The following must be excluded:
costs of in-kind contributions provided by third parties which are not used on the beneficiary's premises and

costs of providing financial support to third parties (if any).

Unit cost table: clinical studies unit cost[6]

[Insert name of clinical study]					
Tasks and unit cost components	**Resources per patient**	**Amount per unit for beneficiary /linked third party**	**Amount per unit for beneficiary /linked third party**	**Amount per unit for beneficiary/linked third party 3 [insert short name]**	**…**

[6] Same table as in proposal and Annex 1.

			1 [insert short name]	**2 [insert short name]**		**in-kind contributions by third party***	
Task No. 1 Blood sample							
Personnel costs	doctors	----	0	0	0	0	
	other medical personnel	Phlebotomy (nurse), 10 minutes	8,33 EUR	11,59 EUR	10,55 EUR	9,76 EUR	
	technical personnel	Sample Processing (lab technician), 15 minutes	9,51 EUR	15,68 EUR	13,77 EUR	12,35 EUR	
Costs of consumables	Category 1	Syringe, 1	XX EUR	XX EUR	XX EUR	XX EUR	
	Category 2	Cannula, 1	XX EUR	XX EUR	XX EUR	XX EUR	
	Category 2	Blood container, 1	XX EUR	XX EUR	XX EUR	XX EUR	
	…						
Costs of medical equipment	Category 1	Use of -80° deep freezer, 60 days	XX EUR	XX EUR	XX EUR	XX EUR	
	Category 2	Use of centrifuge, 15 minutes	XX EUR	XX EUR	XX EUR	XX EUR	
	….						
Costs of other specific services	Category 1						
	Category 2						
	…						
Indirect costs							
Task No. 2							
…							
Total amount per unit			**XX EUR**	**XX EUR**	**XX EUR**	**XX EUR****	
Estimated No of units **(patients/subjects participating in the study)**			**XX**	**XX**	**XX**	**XX**	
Total unit cost for beneficiary/linked third party **(total cost per unit x estimated no of units)**			**XX EUR**	**XX EUR**	**XX EUR**		

* Use costs of third party making in-kind contribution.

** Capped at payment to third party, if any.

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

IS-practice (ISP), established in Renkinstraat 71, Schaarbeek 1030, Belgium, VAT number: BE0478042526, ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become beneficiary No ('2')

in Grant Agreement No 769608 ('the Agreement')

between VLAAMS GEWEST **and** the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'),

for the action entitled 'Policy Development based on Advanced Geospatial Data Analytics and Visualisation (PoliVisu)'.

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

EDIP SRO (EDIP), established in PARIZSKA 1230/1, PLZEN 301 00, Czech Republic, VAT number: CZ25462482, ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become beneficiary No ('3')

in Grant Agreement No 769608 ('the Agreement')

between VLAAMS GEWEST **and** the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'),

for the action entitled 'Policy Development based on Advanced Geospatial Data Analytics and Visualisation (PoliVisu)'.

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

SOCIETE D'ECONOMIE MIXTE ISSY - MEDIA (SEM ISSY MEDIA) (ISSY), established in RUE DU GENERAL LECLERC 62, ISSY LES MOULINEAUX 92130, France, ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become beneficiary No ('4')

in Grant Agreement No 769608 ('the Agreement')

between VLAAMS GEWEST **and** the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'),

for the action entitled 'Policy Development based on Advanced Geospatial Data Analytics and Visualisation (PoliVisu)'.

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

HELP SERVICE REMOTE SENSING SRO (HSRS), established in HUSOVA 2117, BENESOV 256 01, Czech Republic, VAT number: CZ48582611, ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become beneficiary No ('5')

in Grant Agreement No 769608 ('the Agreement')

between VLAAMS GEWEST **and** the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'),

for the action entitled 'Policy Development based on Advanced Geospatial Data Analytics and Visualisation (PoliVisu)'.

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

GEOSPARC NV (GEOS), established in BRUGSESTEENWEG 587, GENT 9030, Belgium, VAT number: BE0808353458, ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become beneficiary No ('6')

in Grant Agreement No 769608 ('the Agreement')

between VLAAMS GEWEST **and** the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'),

for the action entitled 'Policy Development based on Advanced Geospatial Data Analytics and Visualisation (PoliVisu)'.

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

INNOCONNECT SRO (INCO), established in FIALKOVA 1026/16, CERNICE, PLZEN 326 00, Czech Republic, VAT number: CZ05468841, ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become beneficiary No ('7')

in Grant Agreement No 769608 ('the Agreement')

between VLAAMS GEWEST **and** the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'),

for the action entitled 'Policy Development based on Advanced Geospatial Data Analytics and Visualisation (PoliVisu)'.

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

CITY ZEN DATA (CZD), established in 55 rue Charles Nungesser, Guipavas 29490, France, VAT number: FR56792556201, ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become beneficiary No ('8')

in Grant Agreement No 769608 ('the Agreement')

between VLAAMS GEWEST **and** the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'),

for the action entitled 'Policy Development based on Advanced Geospatial Data Analytics and Visualisation (PoliVisu)'.

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

21C CONSULTANCY LIMITED (21C), established in THE WORK PLACE, LADBROKE GROVE 105, LONDON W11 1PG, United Kingdom, ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become beneficiary No ('9')

in Grant Agreement No 769608 ('the Agreement')

between VLAAMS GEWEST **and** the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'),

for the action entitled 'Policy Development based on Advanced Geospatial Data Analytics and Visualisation (PoliVisu)'.

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

ATHENS TECHNOLOGY CENTER SA (ATC), established in RIZAREIOU 10, ATHINA 15233, Greece, VAT number: EL094360380, ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become beneficiary No ('10')

in Grant Agreement No 769608 ('the Agreement')

between VLAAMS GEWEST **and** the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'),

for the action entitled 'Policy Development based on Advanced Geospatial Data Analytics and Visualisation (PoliVisu)'.

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

SPRAVA INFORMACNICH TECHNOLOGII MESTA PLZNE, PRISPEVKOVA ORGANIZACE (SITMP), established in DOMINIKANSKA 4, PLZEN 301 00, Czech Republic, VAT number: CZ66362717, ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become beneficiary No ('11')

in Grant Agreement No 769608 ('the Agreement')

between VLAAMS GEWEST **and** the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'),

for the action entitled 'Policy Development based on Advanced Geospatial Data Analytics and Visualisation (PoliVisu)'.

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

MACQ SA (MACQ), established in RUE DE L AERONEF 2, BRUXELLES 1140, Belgium, ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become beneficiary No ('12')

in Grant Agreement No 769608 ('the Agreement')

between VLAAMS GEWEST **and** the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'),

for the action entitled 'Policy Development based on Advanced Geospatial Data Analytics and Visualisation (PoliVisu)'.

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

PLAN4ALL ZS (P4A), established in K RYBNICKU 557, HORNI BRIZA 330 12, Czech Republic, ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become beneficiary No ('13')

in Grant Agreement No 769608 ('the Agreement')

between VLAAMS GEWEST **and** the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'),

for the action entitled 'Policy Development based on Advanced Geospatial Data Analytics and Visualisation (PoliVisu)'.

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

POLITECNICO DI MILANO (POLIMI), established in PIAZZA LEONARDO DA VINCI 32, MILANO 20133, Italy, VAT number: IT04376620151, ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become beneficiary No ('14')

in Grant Agreement No 769608 ('the Agreement')

between VLAAMS GEWEST **and** the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'),

for the action entitled 'Policy Development based on Advanced Geospatial Data Analytics and Visualisation (PoliVisu)'.

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

STAD GENT (GENT), established in BOTERMARKT 1, GENT 9000, Belgium, VAT number: N/A, ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become beneficiary No ('15')

in Grant Agreement No 769608 ('the Agreement')

between VLAAMS GEWEST **and** the Research Executive Agency (REA) ('the Agency'), under the powers delegated by the European Commission ('the Commission'),

for the action entitled 'Policy Development based on Advanced Geospatial Data Analytics and Visualisation (PoliVisu)'.

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ⓘ print format A4 landscape

MODEL ANNE

FINANCIAL STATEMENT FOR *[BENEFICIARY [nam*

	Eligible[1] costs (per budget category							
	A. Direct personnel costs				**B. Direct costs of subcontracting**	**[C. Direct costs of fin. support]**	**D. Other direct costs**	
	A.1 Employees (or equivalent) A.2 Natural persons under direct contract A.3 Seconded persons [A.6 Personnel for providing access to research infrastructure]		A.4 SME owners without salary A.5 Beneficiaries that are natural persons without salary			[C.1 Financial support] [C.2 Prizes]	D.1 Travel D.2 Equipment D.3 Other goods and services	[D.4 Costs of large research infrastructure]
Form of costs[4]	Actual	Unit	Unit		Actual	Actual	Actual	Actual
	a	Total b	No hours	Total c	d	[e]	f	[g]
[short name beneficiary /linked third party]								

The beneficiary/linked third party hereby confirms that:
The information provided is complete, reliable and true.
The costs declared are eligible (see Article 6).
The costs can be substantiated by adequate records and supporting documentation that will be produced upon re
For the last reporting period: that all the receipts have been declared (see Article 5.3.3).

ⓘ Please declare all eligible costs, even if they exceed the amounts indicated in the estimated budget (see Annex costs that are found to be ineligible.

[1] See Article 6 for the eligibility conditions

[2] The indirect costs claimed must be free of any amounts covered by an operating grant (received under any EU or any indirect costs.

[3] This is the theoretical amount of EU contribution that the system calculates automatically (by multiplying the rei

[4] See Article 5 for the form of costs

[5] Flat rate : 25% of eligible direct costs, from which are excluded: direct costs of subcontracting, costs of in-kind c indirect costs (see Article 6.2.E)

ANNEX 5

MODEL FOR THE CERTIFICATE ON THE FINANCIAL STATEMENTS

For options [*in italics in square brackets*]: choose the applicable option. Options not chosen should be deleted.
For fields in [grey in square brackets]: enter the appropriate data

TABLE OF CONTENTS

Terms of Reference for an Independent Report of Factual Findings on costs declared under a Grant Agreement financed under the Horizon 2020 Research and Innovation Framework Programme

This document sets out the '**Terms of Reference (ToR)**' under which

[OPTION 1: [insert name of the beneficiary] ('the Beneficiary')] [OPTION 2: [insert name of the linked third party] ('the Linked Third Party'), third party linked to the Beneficiary [insert name of the beneficiary] ('the Beneficiary')]

agrees to engage

[**insert legal name of the auditor**] ('the Auditor')

to produce an independent report of factual findings ('the Report') concerning the Financial Statement(s)[1] drawn up by the *[Beneficiary] [Linked Third Party]* for the Horizon 2020 grant agreement [insert number of the grant agreement, title of the action, acronym and duration from/to] ('the Agreement'), and

to issue a Certificate on the Financial Statements' ('CFS') referred to in Article 20.4 of the Agreement based on the compulsory reporting template stipulated by the Commission.

The Agreement has been concluded under the Horizon 2020 Research and Innovation Framework Programme (H2020) between the Beneficiary and *[OPTION 1: the European Union, represented by the European Commission ('the Commission')][OPTION 2: the European Atomic Energy Community (Euratom,) represented by the European Commission ('the Commission')][OPTION 3: the [Research Executive Agency (REA)] [European Research Council Executive Agency (ERCEA)] [Innovation and Networks Executive Agency (INEA)] [Executive Agency for Small and Medium-sized Enterprises (EASME)] ('the Agency'), under the powers delegated by the European Commission ('the Commission').]*

The *[Commission] [Agency]* is mentioned as a signatory of the Agreement with the Beneficiary only. The *[European Union][Euratom][Agency]* is not a party to this engagement.

1.1 Subject of the engagement

The coordinator must submit to the *[Commission][Agency]* the final report within 60 days following the end of the last reporting period which should include, amongst other documents, a CFS for each beneficiary and for each linked third party that requests a total contribution of EUR 325 000 or more, as reimbursement of actual costs and unit costs calculated on the basis of its usual cost accounting practices (see Article 20.4 of the Agreement). The CFS must cover all reporting periods of the beneficiary or linked third party indicated above.

The Beneficiary must submit to the coordinator the CFS for itself and for its linked third party(ies), if the CFS must be included in the final report according to Article 20.4 of the Agreement..

The CFS is composed of two separate documents:

- The Terms of Reference ('the ToR') to be signed by the *[Beneficiary] [Linked Third Party]* and the Auditor;

[1] By which costs under the Agreement are declared (see template 'Model Financial Statements' in Annex 4 to the Grant Agreement).

- The Auditor's Independent Report of Factual Findings ('the Report') to be issued on the Auditor's letterhead, dated, stamped and signed by the Auditor (or the competent public officer) which includes the agreed-upon procedures ('the Procedures') to be performed by the Auditor, and the standard factual findings ('the Findings') to be confirmed by the Auditor.

If the CFS must be included in the final report according to Article 20.4 of the Agreement, the request for payment of the balance relating to the Agreement cannot be made without the CFS. However, the payment for reimbursement of costs covered by the CFS does not preclude the *[Commission,][Agency,]* the European Anti-Fraud Office and the European Court of Auditors from carrying out checks, reviews, audits and investigations in accordance with Article 22 of the Agreement.

1.2 Responsibilities

The *[Beneficiary] [Linked Third Party]:*

must draw up the Financial Statement(s) for the action financed by the Agreement in compliance with the obligations under the Agreement. The Financial Statement(s) must be drawn up according to the *[Beneficiary's] [Linked Third Party's]* accounting and book-keeping system and the underlying accounts and records;

must send the Financial Statement(s) to the Auditor;

is responsible and liable for the accuracy of the Financial Statement(s);

is responsible for the completeness and accuracy of the information provided to enable the Auditor to carry out the Procedures. It must provide the Auditor with a written representation letter supporting these statements. The written representation letter must state the period covered by the statements and must be dated;

accepts that the Auditor cannot carry out the Procedures unless it is given full access to the *[Beneficiary's] [Linked Third Party's]* staff and accounting as well as any other relevant records and documentation.

The Auditor:

[Option 1 by default: is qualified to carry out statutory audits of accounting documents in accordance with Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts, amending Council Directives 78/660/EEC and 83/349/EEC and repealing Council Directive 84/253/EEC or similar national regulations*]*.

[Option 2 if the Beneficiary or Linked Third Party has an independent Public Officer: is a competent and independent Public Officer for which the relevant national authorities have established the legal capacity to audit the Beneficiary*]*.

[Option 3 if the Beneficiary or Linked Third Party is an international organisation: is an [internal] [external] auditor in accordance with the internal financial regulations and procedures of the international organisation*]*.

The Auditor:

must be independent from the Beneficiary *[and the Linked Third Party]*, in particular, it must not have been involved in preparing the *[Beneficiary's] [Linked Third Party's]* Financial Statement(s);

must plan work so that the Procedures may be carried out and the Findings may be assessed;

must adhere to the Procedures laid down and the compulsory report format;

must carry out the engagement in accordance with this ToR;

must document matters which are important to support the Report;

must base its Report on the evidence gathered;

must submit the Report to the *[Beneficiary] [Linked Third Party]*.

The Commission sets out the Procedures to be carried out by the Auditor. The Auditor is not responsible for their suitability or pertinence. As this engagement is not an assurance engagement, the Auditor does not provide an audit opinion or a statement of assurance.

1.3 Applicable Standards

The Auditor must comply with these Terms of Reference and with[2]:

- the International Standard on Related Services ('ISRS') 4400 *Engagements to perform Agreed-upon Procedures regarding Financial Information* as issued by the International Auditing and Assurance Standards Board (IAASB);
- the *Code of Ethics for Professional Accountants* issued by the International Ethics Standards Board for Accountants (IESBA). Although ISRS 4400 states that independence is not a requirement for engagements to carry out agreed-upon procedures, the *[Commission][Agency]* requires that the Auditor also complies with the Code's independence requirements.

The Auditor's Report must state that there is no conflict of interests in establishing this Report between the Auditor and the Beneficiary *[and the Linked Third Party]*, and must specify - if the service is invoiced - the total fee paid to the Auditor for providing the Report.

1.4 Reporting

The Report must be written in the language of the Agreement (see Article 20.7).

Under Article 22 of the Agreement, the Commission*[, the Agency]*, the European Anti-Fraud Office and the Court of Auditors have the right to audit any work that is carried out under the action and for which costs are declared from [*the European Union*] [*Euratom*] budget. This includes work related to this engagement. The Auditor must provide access to all working papers (e.g. recalculation of hourly rates, verification of the time declared for the action) related to this assignment if the Commission *[, the Agency]*, the European Anti-Fraud Office or the European Court of Auditors requests them.

1.5 Timing

The Report must be provided by *[*dd Month yyyy*]*.

1.6 Other terms

[*The [Beneficiary] [Linked Third Party] and the Auditor can use this section to agree other specific terms, such as the Auditor's fees, liability, applicable law, etc. Those specific terms must not contradict the terms specified above.*]

[legal name of the Auditor]	[legal name of the *[Beneficiary][Linked Third Party]*]
[name & function of authorised representative]	[name & function of authorised representative]
[dd Month yyyy]	[dd Month yyyy]
Signature of the Auditor	Signature of the *[Beneficiary][Linked Third Party]*

[2] Supreme Audit Institutions applying INTOSAI-standards may carry out the Procedures according to the corresponding International Standards of Supreme Audit Institutions and code of ethics issued by INTOSAI instead of the International Standard on Related Services ('ISRS') 4400 and the Code of Ethics for Professional Accountants issued by the IAASB and the IESBA.

Independent Report of Factual Findings on costs declared under Horizon 2020 Research and Innovation Framework Programme

(To be printed on the Auditor's letterhead)

To
[name of contact person(s)], [Position]
[[*Beneficiary's*] [*Linked Third Party's*] name]
[Address]
[dd Month yyyy]

Dear [Name of contact person(s)],

As agreed under the terms of reference dated [dd Month yyyy]

with *[OPTION 1: [insert name of the beneficiary] ('the Beneficiary')] [OPTION 2: [insert name of the linked third party] ('the Linked Third Party'), third party linked to the Beneficiary [insert name of the beneficiary] ('the Beneficiary')],*

we

[name of the auditor] ('the Auditor'),

established at

[full address/city/state/province/country],

represented by

[name and function of an authorised representative],

have carried out the procedures agreed with you regarding the costs declared in the Financial Statement(s)[3] of the *[Beneficiary] [Linked Third Party]* concerning the grant agreement [insert grant agreement reference: number, title of the action and acronym] ('the Agreement'),

with a total cost declared of
[total amount] EUR,

and a total of actual costs and 'direct personnel costs declared as unit costs calculated in accordance with the [*Beneficiary's*] [*Linked Third Party's*] usual cost accounting practices' declared of

[sum of total actual costs and total direct personnel costs declared as unit costs calculated in accordance with the *[Beneficiary's] [Linked Third Party's]* usual cost accounting practices] EUR

and **hereby provide our Independent Report of Factual Findings ('the Report')** using the compulsory report format agreed with you.

The Report

Our engagement was carried out in accordance with the terms of reference ('the ToR') appended to this Report. The Report includes the agreed-upon procedures ('the Procedures') carried out and the standard factual findings ('the Findings') examined.

[3] By which the Beneficiary declares costs under the Agreement (see template 'Model Financial Statement' in Annex 4 to the Agreement).

The Procedures were carried out solely to assist the [*Commission*] [*Agency*] in evaluating whether the [*Beneficiary's*] [*Linked Third Party's*] costs in the accompanying Financial Statement(s) were declared in accordance with the Agreement. The *[Commission] [Agency]* draws its own conclusions from the Report and any additional information it may require.

The scope of the Procedures was defined by the Commission. Therefore, the Auditor is not responsible for their suitability or pertinence. Since the Procedures carried out constitute neither an audit nor a review made in accordance with International Standards on Auditing or International Standards on Review Engagements, the Auditor does not give a statement of assurance on the Financial Statements.

Had the Auditor carried out additional procedures or an audit of the *[Beneficiary's] [Linked Third Party's]* Financial Statements in accordance with International Standards on Auditing or International Standards on Review Engagements, other matters might have come to its attention and would have been included in the Report.

Not applicable Findings

We examined the Financial Statement(s) stated above and considered the following Findings not applicable:

Explanation (to be removed from the Report):

*If a Finding was not applicable, it must be marked as '**N.A**.' ('Not applicable') in the corresponding row on the right-hand column of the table and means that the Finding did not have to be corroborated by the Auditor and the related Procedure(s) did not have to be carried out.*

The reasons of the non-application of a certain Finding must be obvious i.e.

i) if no cost was declared under a certain category then the related Finding(s) and Procedure(s) are not applicable;

ii) if the condition set to apply certain Procedure(s) are not met the related Finding(s) and those Procedure(s) are not applicable. For instance, for 'beneficiaries with accounts established in a currency other than euro' the Procedure and Finding related to 'beneficiaries with accounts established in euro' are not applicable. Similarly, if no additional remuneration is paid, the related Finding(s) and Procedure(s) for additional remuneration are not applicable.

List here all Findings considered not applicable for the present engagement and explain the reasons of the non-applicability.

….

Exceptions

Apart from the exceptions listed below, the *[Beneficiary] [Linked Third Party]* provided the Auditor all the documentation and accounting information needed by the Auditor to carry out the requested Procedures and evaluate the Findings.

Explanation (to be removed from the Report):

- *If the Auditor was not able to successfully complete a procedure requested, it must be marked as '**E**' ('Exception') in the corresponding row on the right-hand column of the table. The reason such as the inability to reconcile key information or the unavailability of data that prevents the Auditor from carrying out the Procedure must be indicated below.*
- *If the Auditor cannot corroborate a standard finding after having carried out the corresponding procedure, it must also be marked as '**E**' ('Exception') and, where possible, the reasons why the Finding was not fulfilled and its possible impact must be explained here below.*

List here any exceptions and add any information on the cause and possible consequences of each exception, if known. If the exception is quantifiable, include the corresponding amount.

….

Example (to be removed from the Report):

1. *The Beneficiary was unable to substantiate the Finding number 1 on … because ….*
2. *Finding number 30 was not fulfilled because the methodology used by the Beneficiary to calculate unit costs was different from the one approved by the Commission. The differences were as follows: …*
3. *After carrying out the agreed procedures to confirm the Finding number 31, the Auditor found a difference of _____ EUR. The difference can be explained by …*

Further Remarks

In addition to reporting on the results of the specific procedures carried out, the Auditor would like to make the following general remarks:

Example (to be removed from the Report):

1. *Regarding Finding number 8 the conditions for additional remuneration were considered as fulfilled because …*
2. *In order to be able to confirm the Finding number 15 we carried out the following additional procedures: ….*

Use of this Report

This Report may be used only for the purpose described in the above objective. It was prepared solely for the confidential use of the *[Beneficiary] [Linked Third Party]* and the [*Commission*] [*Agency*], and only to be submitted to the [*Commission*] [*Agency*] in connection with the requirements set out in Article 20.4 of the Agreement. The Report may not be used by the *[Beneficiary] [Linked Third Party]* or by the [*Commission*] [*Agency*] for any other purpose, nor may it be distributed to any other parties. The [*Commission*] [*Agency*] may only disclose the Report to authorised parties, in particular to the European Anti-Fraud Office (OLAF) and the European Court of Auditors.

This Report relates only to the Financial Statement(s) submitted to the *[Commission] [Agency]* by the *[Beneficiary] [Linked Third Party]* for the Agreement. Therefore, it does not extend to any other of the [*Beneficiary's*] [*Linked Third Party's*] Financial Statement(s).

There was no conflict of interest [4] between the Auditor and the Beneficiary *[and Linked Third Party]* in establishing this Report. The total fee paid to the Auditor for providing the Report was EUR _____ (including EUR_____ of deductible VAT).

We look forward to discussing our Report with you and would be pleased to provide any further information or assistance.

[legal name of the Auditor]
[name and function of an authorised representative]
[dd Month yyyy]
Signature of the Auditor

[4] A conflict of interest arises when the Auditor's objectivity to establish the certificate is compromised in fact or in appearance when the Auditor for instance:
- was involved in the preparation of the Financial Statements;
- stands to benefit directly should the certificate be accepted;
- has a close relationship with any person representing the beneficiary;
- is a director, trustee or partner of the beneficiary; or
- is in any other situation that compromises his or her independence or ability to establish the certificate impartially.

Agreed-upon procedures to be performed and standard factual findings to be confirmed by the Auditor

The European Commission reserves the right to i) provide the auditor with additional guidance regarding the procedure ascertained and the way in which to present them (this may include sample coverage and findings) or to ii) Beneficiary in writing. The procedures carried out by the auditor to confirm the standard factual finding are listed in th

If this certificate relates to a Linked Third Party, any reference here below to 'the Beneficiary' is to be considered as a reference to

The 'result' column has three different options: 'C', 'E' and 'N.A.':

'C' stands for 'confirmed' and means that the auditor can confirm the 'standard factual finding' and, therefore
'E' stands for 'exception' and means that the Auditor carried out the procedures but cannot confirm the 'standa
was not able to carry out a specific procedure (e.g. because it was impossible to reconcile key information or d
'N.A.' stands for 'not applicable' and means that the Finding did not have to be examined by the Auditor and t
to be carried out. The reasons of the non-application of a certain Finding must be obvious i.e. i) if no cost was
the related Finding(s) and Procedure(s) are not applicable; ii) if the condition set to apply certain Procedure(s)
and Procedure(s) are not applicable. For instance, for 'beneficiaries with accounts established in a currency oth
to 'beneficiaries with accounts established in euro' is not applicable. Similarly, if no additional remuneration i
Procedure(s) for additional remuneration are not applicable.

Ref	Procedures	Stan
A	**ACTUAL PERSONNEL COSTS AND UNIT COSTS CALCULATED BY THE BENEFICIARY IN AC COST ACCOUNTING PRACTICE**	
	The Auditor draws a sample of persons whose costs were declared in the Financial Statement(s) to carry out the procedures indicated in the consecutive points of this section A. (*The sample should be selected randomly so that it is representative. Full coverage is required if there are fewer than 10 people (including employees, natural persons working under a dir contract and personnel seconded by a third party), otherwise the sample should have a minimum of 10 people, or 10% of the total, whichever number is the highest)* The Auditor sampled _____ people out of the total of _____ people.	

Ref	Procedures	Stan
A.1	**PERSONNEL COSTS** <u>For the persons included in the sample and working under an employment contract or equivalent act (general procedures for individual actual personnel costs and personnel costs declared as unit costs)</u> To confirm standard factual findings 1-5 listed in the next column, the Auditor reviewed following information/documents provided by the Beneficiary: o a list of the persons included in the sample indicating the period(s) during which they worked for the action, their position (classification or category) and type of contract; o the payslips of the employees included in the sample; o reconciliation of the personnel costs declared in the Financial Statement(s) with the accounting system (project accounting and general ledger) and payroll system; o information concerning the employment status and employment conditions of personnel included in the sample, in particular their employment contracts or equivalent; o the Beneficiary's usual policy regarding payroll matters (e.g. salary policy, overtime policy, variable pay); o applicable national law on taxes, labour and social security and o any other document that supports the personnel costs declared. The Auditor also verified the eligibility of all components of the retribution (see Article 6 GA) and recalculated the personnel costs for employees included in the sample.	1) The em hired accorda legislat Benefic supervi and accorda Benefic 2) Person the accoun 3) Costs v and rec and pay 4) Person any ine 5) There betwee charge costs Audito
	Further procedures if 'additional remuneration' is paid To confirm standard factual findings 6-9 listed in the next column, the Auditor: o reviewed relevant documents provided by the Beneficiary (legal form, legal/statutory	6) The "additi non-pr

Ref	Procedures	Stan
	obligations, the Beneficiary's usual policy on additional remuneration, criteria used for its calculation…); o recalculated the amount of additional remuneration eligible for the action based on the supporting documents received (full-time or part-time work, exclusive or non-exclusive dedication to the action, etc.) to arrive at the applicable FTE/year and pro-rata rate (see data collected in the course of carrying out the procedures under A.2 'Productive hours' and A.4 'Time recording system'). *IF ANY PART OF THE REMUNERATION PAID TO THE EMPLOYEE IS NOT MANDATORY ACCORDING TO THE NATIONAL LAW OR THE EMPLOYMENT CONTRACT("ADDITIONAL REMUNERATION") AND IS ELIGIBLE UNDER THE PROVISIONS OF ARTICLE 6.2.A.1, THIS CAN BE CHARGED AS ELIGIBLE COST TO THE ACTION UP TO THE FOLLOWING AMOUNT:* *(A) IF THE PERSON WORKS FULL TIME AND EXCLUSIVELY ON THE ACTION DURING THE FULL YEAR: UP TO EUR 8 000/YEAR;* *(B) IF THE PERSON WORKS EXCLUSIVELY ON THE ACTION BUT NOT FULL -TIME OR NOT FOR THE FULL YEAR: UP TO THE CORRESPONDING PRO-RATA AMOUNT OF EUR 8 000, OR* *(C) IF THE PERSON DOES NOT WORK EXCLUSIVELY ON THE ACTION : UP TO A PRO -RATA AMOUNT CALCULATED IN ACCORDANCE TO ARTICLE 6.2.A.1.*	7) The remune to th remune consist same k was rec 8) The cri additio objecti by the the sou 9) The remune personn action v per F equival person action or did the acti
	Additional procedures in case "unit costs calculated by the Beneficiary in accordance with its usual cost accounting practices" is applied: Apart from carrying out the procedures indicated above to confirm standard factual findings 1-5 and, if applicable, also 6-9, the Auditor carried out following procedures to confirm standard	10) The p the F calcul the accou metho

Ref	Procedures	Stan
	factual findings 10-13 listed in the next column: o obtained a description of the Beneficiary's usual cost accounting practice to calculate unit costs;. o reviewed whether the Beneficiary's usual cost accounting practice was applied for the Financial Statements subject of the present CFS; o verified the employees included in the sample were charged under the correct category (in accordance with the criteria used by the Beneficiary to establish personnel categories) by reviewing the contract/HR-record or analytical accounting records; o verified that there is no difference between the total amount of personnel costs used in calculating the cost per unit and the total amount of personnel costs recorded in the statutory accounts; o verified whether actual personnel costs were adjusted on the basis of budgeted or estimated elements and, if so, verified whether those elements used are actually relevant for the calculation, objective and supported by documents.	used i 11) The under 12) Total calcul consis record accou 13) Any eleme Benef calcul calcul corres verifi
	<u>For natural persons included in the sample and working with the Beneficiary under a direct contract other than an employment contract, such as consultants (no subcontractors)</u>. To confirm standard factual findings 14-18 listed in the next column the Auditor reviewed following information/documents provided by the Beneficiary: o the contracts, especially the cost, contract duration, work description, place of work, ownership of the results and reporting obligations to the Beneficiary; o the employment conditions of staff in the same category to compare costs and; o any other document that supports the costs declared and its registration (e.g. invoices,	14) The n the B the Be 15) They Benef otherw Benef 16) The r belon

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	accounting records, etc.).	17) Their signif those simila emplo Benef
		18) The audit in the
	For personnel seconded by a third party and included in the sample (not subcontractors) To confirm standard factual findings 19-22 listed in the next column, the Auditor reviewed following information/documents provided by the Beneficiary: o their secondment contract(s) notably regarding costs, duration, work description, place of work and ownership of the results; o if there is reimbursement by the Beneficiary to the third party for the resource made available (in-kind contribution against payment): any documentation that supports the costs declared (e.g. contract, invoice, bank payment, and proof of registration in its accounting/payroll, etc.) and reconciliation of the Financial Statement(s) with the accounting system (project accounting and general ledger) as well as any proof that the amount invoiced by the third party did not include any profit; o if there is no reimbursement by the Beneficiary to the third party for the resource made available (in-kind contribution free of charge): a proof of the actual cost borne by the Third Party for the resource made available free of charge to the Beneficiary such as a statement of costs incurred by the Third Party and proof of the registration in the Third Party's accounting/payroll; o any other document that supports the costs declared (e.g. invoices, etc.).	19) Secon the B the (unles the B 20) The r belon *If personn payment:* 21) The c suppo and re Benef third profit *If person charge:* 22) The excee

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		record third with
A.2	**PRODUCTIVE HOURS** To confirm standard factual findings 23-28 listed in the next column, the Auditor reviewed relevant documents, especially national legislation, labour agreements and contracts and time records of the persons included in the sample, to verify that: o the annual productive hours applied were calculated in accordance with one of the methods described below, o the full-time equivalent (FTEs) ratios for employees not working full-time were correctly calculated. If the Beneficiary applied method B, the auditor verified that the correctness in which the total number of hours worked was calculated and that the contracts specified the annual workable hours. If the Beneficiary applied method C, the auditor verified that the 'annual productive hours' applied when calculating the hourly rate were equivalent to at least 90 % of the 'standard annual workable hours'. The Auditor can only do this if the calculation of the standard annual workable hours can be supported by records, such as national legislation, labour agreements, and contracts. *BENEFICIARY'S PRODUCTIVE HOURS' FOR PERSONS WORKING FULL TIME SHALL BE ONE OF THE FOLLOWING METHODS:* ***A.*** *1720 ANNUAL PRODUCTIVE HOURS (PRO-RATA FOR PERSONS NOT WORKING FULL-TIME)* ***B.*** *THE TOTAL NUMBER OF HOURS WORKED BY THE PERSON FOR THE BENEFICIARY IN THE YEAR (THIS METHOD IS ALSO REFERRED TO AS 'TOTAL NUMBER OF HOURS WORKED' IN THE NEXT COLUMN). THE CALCULATION OF THE TOTAL NUMBER OF HOURS WORKED WAS DONE AS FOLLOWS: ANNUAL WORKABLE HOURS OF THE PERSON ACCORDING TO THE EMPLOYMENT*	23) The metho *delete* [**A**: 1 [**B**: t work [**C**: produ corres practi 24) Produ calcul 25) For e full-t equiv corre *If the Be B.* 26) The of 'a overti verifi docu Benef

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	CONTRACT, APPLICABLE LABOUR AGREEMENT OR NATIONAL LAW PLUS OVERTIME WORKED MINUS ABSENCES (SUCH AS SICK LEAVE OR SPECIAL LEAVE). ***C.** THE STANDARD NUMBER OF ANNUAL HOURS GENERALLY APPLIED BY THE BENEFICIARY FOR ITS PERSONNEL IN ACCORDANCE WITH ITS USUAL COST ACCOUNTING PRACTICES (THIS METHOD IS ALSO REFERRED TO AS 'STANDARD ANNUAL PRODUCTIVE HOURS' IN THE NEXT COLUMN). THIS NUMBER MUST BE AT LEAST 90% OF THE STANDARD ANNUAL WORKABLE HOURS.* *'ANNUAL WORKABLE HOURS' MEANS THE PERIOD DURING WHICH THE PERSONNEL MUST BE WORKING, AT THE EMPLOYER'S DISPOSAL AND CARRYING OUT HIS /HER ACTIVITY OR DUTIES UNDER THE EMPLOYMENT CONTRACT, APPLICABLE COLLECTIVE LABOUR AGREEMENT OR NATIONAL WORKING TIME LEGISLATION.*	26.1) Th th fi pr is be ho *If the Be* *C.* 27) The of 's hours the do Benef 28) The used rate usual of th equiv the 'a
A.3	**HOURLY PERSONNEL RATES** <u>I) For unit costs calculated in accordance to the Beneficiary's usual cost accounting practice (unit costs):</u> If the Beneficiary has a "Certificate on Methodology to calculate unit costs " (CoMUC) approved by the Commission, the Beneficiary provides the Auditor with a description of the approved methodology and the Commission's letter of acceptance. The Auditor verified that the	29) The [*choo* *the ot* [Opti rates) accor Benef

Ref	Procedures	Stan
	Beneficiary has indeed used the methodology approved. If so, no further verification is necessary. If the Beneficiary does not have a "Certificate on Methodology" (CoMUC) approved by the Commission, or if the methodology approved was not applied, then the Auditor: o reviewed the documentation provided by the Beneficiary, including manuals and internal guidelines that explain how to calculate hourly rates; o recalculated the unit costs (hourly rates) of staff included in the sample following the results of the procedures carried out in A.1 and A.2. II) For individual hourly rates: The Auditor: o reviewed the documentation provided by the Beneficiary, including manuals and internal guidelines that explain how to calculate hourly rates; o recalculated the hourly rates of staff included in the sample (recalculation of all hourly rates if the Beneficiary uses annual rates, recalculation of three months selected randomly for every year and person if the Beneficiary uses monthly rates) following the results of the procedures carried out in A.1 and A.2; o (only in case of monthly rates) confirmed that the time spent on parental leave is not deducted, and that, if parts of the basic remuneration are generated over a period longer than a month, the Beneficiary has included only the share which is generated in the month. *"UNIT COSTS CALCULATED BY THE BENEFICIARY IN ACCORDANCE WITH ITS USUAL COST ACCOUNTING PRACTICES":* *IT IS CALCULATED BY DIVIDING THE TOTAL AMOUNT OF PERSONNEL COSTS OF THE CATEGORY TO WHICH THE EMPLOYEE BELONGS VERIFIED IN LINE WITH PROCEDURE A.1 BY THE NUMBER OF FTE AND THE ANNUAL TOTAL PRODUCTIVE HOURS OF THE SAME CATEGORY CALCULATED BY THE BENEFICIARY IN ACCORDANCE WITH PROCEDURE A.2.*	accou [Opti rates *For optio* *and if the* *methodolo* *Commissi* 30) The Comm dolog rates. organ accou applie activi sourc *For optio* *and if th* *methodolo* *Commissi* 31) The u the A the Benef *For optio* *hourly rat* 32) The

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	HOURLY RATE FOR INDIVIDUAL ACTUAL PERSONAL COSTS: *IT IS CALCULATED FOLLOWING ONE OF THE TWO OPTIONS BELOW:* *A) [OPTION BY DEFAULT] BY DIVIDING THE ACTUAL ANNUAL AMOUNT OF PERSONNEL COSTS OF AN EMPLOYEE VERIFIED IN LINE WITH PROCEDURE A.1 BY THE NUMBER OF ANNUAL PRODUCTIVE HOURS VERIFIED IN LINE WITH PROCEDURE A.2 (FULL FINANCIAL YEAR HOURLY RATE);* *B) BY DIVIDING THE ACTUAL MONTHLY AMOUNT OF PERSONNEL COSTS OF AN EMPLOYEE VERIFIED IN LINE WITH PROCEDURE A.1 BY 1/12 OF THE NUMBER OF ANNUAL PRODUCTIVE HOURS VERIFIED IN LINE WITH PROCEDURE A.2.(MONTHLY HOURLY RATE).*	calcu the sa the B 32.1) Th one year each
A.4	**TIME RECORDING SYSTEM** To verify that the time recording system ensures the fulfilment of all minimum requirements and that the hours declared for the action were correct, accurate and properly authorised and supported by documentation, the Auditor made the following checks for the persons included in the sample that declare time as worked for the action on the basis of time records: o description of the time recording system provided by the Beneficiary (registration, authorisation, processing in the HR-system); o its actual implementation; o time records were signed at least monthly by the employees (on paper or electronically) and authorised by the project manager or another manager; o the hours declared were worked within the project period; o there were no hours declared as worked for the action if HR-records showed absence due to holidays or sickness (further cross-checks with travels are carried out in B.1 below) ; o the hours charged to the action matched those in the time recording system.	33) All pe dedic **daily** using **based** *answe* *applic* 34) Their autho the p super 35) Hours within were prese HR-re

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	ONLY THE HOURS WORKED ON THE ACTION CAN BE CHARGED . ALL WORKING TIME TO BE CHARGED SHOULD BE RECORDED THROUGHOUT THE DURATION OF THE PROJECT , ADEQUATELY SUPPORTED BY EVIDENCE OF THEIR REALITY AND RELIABILITY (SEE SPECIFIC PROVISIONS BELOW FOR PERSONS WORKING EXCLUSIVELY FOR THE ACTION WITHOUT TIME RECORDS).	36) There betwe charg numb
	If the persons are working exclusively for the action and without time records For the persons selected that worked exclusively for the action without time records, the Auditor verified evidence available demonstrating that they were in reality exclusively dedicated to the action and that the Beneficiary signed a declaration confirming that they have worked exclusively for the action.	37) The suppo signe by gathe
B	**COSTS OF SUBCONTRACTING**	
B.1	**The Auditor obtained the detail/breakdown of subcontracting costs and sampled _____ cost items selected randomly** (*full coverage is required if there are fewer than 10 items, otherwise the sample should have a minimum of 10 item, or 10% of the total, whichever number is highest*). To confirm standard factual findings 38-42 listed in the next column, the Auditor reviewed the following for the items included in the sample: o the use of subcontractors was foreseen in Annex 1; o subcontracting costs were declared in the subcontracting category of the Financial Statement; o supporting documents on the selection and award procedure were followed; o the Beneficiary ensured best value for money (key elements to appreciate the respect of this principle are the award of the subcontract to the bid offering best price-quality ratio, under conditions of transparency and equal treatment. In case an existing framework contract was used the Beneficiary ensured it was established on the basis of the principle of best value for money under conditions of transparency and equal treatment).	38) The subco forese were Stater subco 39) There reque differ of the the intern procu Subco accor of bes *(Whe collec*

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	In particular, i. if the Beneficiary acted as a contracting authority within the meaning of Directive 2004/18/EC (or 2014/24/EU) or of Directive 2004/17/EC (or 2014/25/EU), the Auditor verified that the applicable national law on public procurement was followed and that the subcontracting complied with the Terms and Conditions of the Agreement. ii. if the Beneficiary did not fall under the above-mentioned category the Auditor verified that the Beneficiary followed their usual procurement rules and respected the Terms and Conditions of the Agreement.. For the items included in the sample the Auditor also verified that: o the subcontracts were not awarded to other Beneficiaries in the consortium; o there were signed agreements between the Beneficiary and the subcontractor; o there was evidence that the services were provided by subcontractor;	*the r Benef "Exce The C this wheth accep* 40) The awarc of the 41) All suppo agree Benef subco 42) There servic subco
C	**COSTS OF PROVIDING FINANCIAL SUPPORT TO THIRD PARTIES**	
C.1	**The Auditor obtained the detail/breakdown of the costs of providing financial support to third parties and sampled _____ cost items selected randomly** (*full coverage is required if there are fewer than 10 items, otherwise the sample should have a minimum of 10 item, or 10% of the total, whichever number is highest*). The Auditor verified that the following minimum conditions were met: a) the maximum amount of financial support for each third party did not exceed EUR 60 000, unless explicitly mentioned in Annex 1;	43) All n met

Ref	Procedures	Stan
	b) the financial support to third parties was agreed in Annex 1 of the Agreement and the other provisions on financial support to third parties included in Annex 1 were respected.	

D	OTHER ACTUAL DIRECT COSTS	
D.1	**COSTS OF TRAVEL AND RELATED SUBSISTENCE ALLOWANCES** **The Auditor sampled _____ cost items selected randomly** (*full coverage is required if there are fewer than 10 items, otherwise the sample should have a minimum of 10 item, or 10% of the total, whichever number is the highest*). The Auditor inspected the sample and verified that: o travel and subsistence costs were consistent with the Beneficiary's usual policy for travel. In this context, the Beneficiary provided evidence of its normal policy for travel costs (e.g. use of first class tickets, reimbursement by the Beneficiary on the basis of actual costs, a lump sum or per diem) to enable the Auditor to compare the travel costs charged with this policy; o travel costs are correctly identified and allocated to the action (e.g. trips are directly linked to the action) by reviewing relevant supporting documents such as minutes of meetings, workshops or conferences, their registration in the correct project account, their consistency with time records or with the dates/duration of the workshop/conference; o no ineligible costs or excessive or reckless expenditure was declared.	44) Costs and re Benef travel 45) There trip ar 46) The were regard dates, with accou 47) No in or re declar
D.2	**DEPRECIATION COSTS FOR EQUIPMENT, INFRASTRUCTURE OR OTHER ASSETS** **The Auditor sampled _____ cost items selected randomly** (*full coverage is required if there are fewer than 10 items, otherwise the sample should have a minimum of 10 item, or 10% of the total, whichever number is the highest*). For "equipment, infrastructure or other assets" [from now on called "asset(s)"] selected in the sample the Auditor verified that: o the assets were acquired in conformity with the Beneficiary's internal guidelines and procedures; o they were correctly allocated to the action (with supporting documents such as delivery	48) Procu and g 49) There grant charg 50) The a was t record docur

	note invoice or any other proof demonstrating the link to the action) o they were entered in the accounting system; o the extent to which the assets were used for the action (as a percentage) was supported by reliable documentation (e.g. usage overview table); The Auditor recalculated the depreciation costs and verified that they were in line with the applicable rules in the Beneficiary's country and with the Beneficiary's usual accounting policy (e.g. depreciation calculated on the acquisition value). The Auditor verified that no ineligible costs such as deductible VAT, exchange rate losses, excessive or reckless expenditure were declared (see Article 6.5 GA).	51) The c to cha was in rules count usual 52) The corres usage 53) No in or re declar
D.3	**COSTS OF OTHER GOODS AND SERVICES** **The Auditor sampled _____ cost items selected randomly** (*full coverage is required if there are fewer than 10 items, otherwise the sample should have a minimum of 10 item, or 10% of the total, whichever number is highest*). For the purchase of goods, works or services included in the sample the Auditor verified that: o the contracts did not cover tasks described in Annex 1; o they were correctly identified, allocated to the proper action, entered in the accounting system (traceable to underlying documents such as purchase orders, invoices and accounting); o the goods were not placed in the inventory of durable equipment; o the costs charged to the action were accounted in line with the Beneficiary's usual accounting practices; o no ineligible costs or excessive or reckless expenditure were declared (see Article 6 GA). In addition, the Auditor verified that these goods and services were acquired in conformity with the Beneficiary's internal guidelines and procedures, in particular: o if Beneficiary acted as a contracting authority within the meaning of Directive	54) Contr did no Annex 55) Costs corre were inven equip 56) The c with accou adequ 57) No in or re declar invoic eleme any m

	2004/18/EC (or 2014/24/EU) or of Directive 2004/17/EC (or 2014/25/EU), the Auditor verified that the applicable national law on public procurement was followed and that the procurement contract complied with the Terms and Conditions of the Agreement. o if the Beneficiary did not fall into the category above, the Auditor verified that the Beneficiary followed their usual procurement rules and respected the Terms and Conditions of the Agreement. For the items included in the sample the Auditor also verified that: o the Beneficiary ensured best value for money (key elements to appreciate the respect of this principle are the award of the contract to the bid offering best price-quality ratio, under conditions of transparency and equal treatment. In case an existing framework contract was used the Auditor also verified that the Beneficiary ensured it was established on the basis of the principle of best value for money under conditions of transparency and equal treatment); *SUCH GOODS AND SERVICES INCLUDE, FOR INSTANCE, CONSUMABLES AND SUPPLIES, DISSEMINATION (INCLUDING OPEN ACCESS), PROTECTION OF RESULTS, SPECIFIC EVALUATION OF THE ACTION IF IT IS REQUIRED BY THE AGREEMENT, CERTIFICATES ON THE FINANCIAL STATEMENTS IF THEY ARE REQUIRED BY THE AGREEMENT AND CERTIFICATES ON THE METHODOLOGY, TRANSLATIONS, REPRODUCTION.*	58) Procu and There reque differ of the the intern procu purch accor of bes *(Whe collec the r Benef "Exce The this wheth accep*
D.4	**AGGREGATED CAPITALISED AND OPERATING COSTS OF RESEARCH INFRASTRUCTURE** The Auditor ensured the existence of a positive ex-ante assessment (issued by the EC Services) of the cost accounting methodology of the Beneficiary allowing it to apply the guidelines on direct costing for large research infrastructures in Horizon 2020. ***In the cases that a positive ex-ante assessment has been issued*** *(see the standard factual findings 59-60 on the next column)**,***	59) The costs Infras appro Finan with descr ante a

	The Auditor ensured that the beneficiary has applied consistently the methodology that is explained and approved in the positive ex ante assessment; ***In the cases that a positive ex-ante assessment has NOT been issued*** *(see the standard factual findings 61 on the next column),* The Auditor verified that no costs of Large Research Infrastructure have been charged as direct costs in any costs category; ***In the cases that a draft ex-ante assessment report has been issued with recommendation for further changes*** *(see the standard factual findings 61 on the next column),* The Auditor followed the same procedure as above (when a positive ex-ante assessment has NOT yet been issued) and paid particular attention (testing reinforced) to the cost items for which the draft ex-ante assessment either rejected the inclusion as direct costs for Large Research Infrastructures or issued recommendations.	60) Any meth one exten adjust 61) The free items Resea
E	**USE OF EXCHANGE RATES**	
E.1	a) For Beneficiaries with accounts established in a currency other than euros **The Auditor sampled _____ cost items selected randomly and verified that the exchange rates used for converting other currencies into euros were in accordance with the following rules established in the Agreement** (*full coverage is required if there are fewer than 10 items, otherwise the sample should have a minimum of 10 item, or 10% of the total, whichever number is highest)*: *COSTS RECORDED IN THE ACCOUNTS IN A CURRENCY OTHER THAN EURO SHALL BE CONVERTED INTO EURO AT THE AVERAGE OF THE DAILY EXCHANGE RATES PUBLISHED IN THE C SERIES OF OFFICIAL JOURNAL OF THE EUROPEAN UNION (https://www.ecb.int/stats/exchange/eurofxref/html/index.en.html), DETERMINED OVER THE CORRESPONDING REPORTING PERIOD.* *IF NO DAILY EURO EXCHANGE RATE IS PUBLISHED IN THE OFFICIAL JOURNAL OF THE EUROPEAN UNION FOR THE CURRENCY IN QUESTION, CONVERSION SHALL BE MADE AT THE AVERAGE OF THE MONTHLY ACCOUNTING RATES ESTABLISHED BY THE COMMISSION AND PUBLISHED ON ITS WEBSITE (http://ec.europa.eu/budget/contracts_grants/info_contracts/inforeuro/inforeuro_en.cfm), DETERMINED OVER THE CORRESPONDING REPORTING PERIOD.*	62) The conve Euros the r Grant was figure

	b) For Beneficiaries with accounts established in euros **The Auditor sampled _____ cost items selected randomly and verified that the exchange rates used for converting other currencies into euros were in accordance with the following rules established in the Agreement** (*full coverage is required if there are fewer than 10 items, otherwise the sample should have a minimum of 10 item, or 10% of the total, whichever number is highest)*: *COSTS INCURRED IN ANOTHER CURRENCY SHALL BE CONVERTED INTO EURO BY APPLYING THE BENEFICIARY'S USUAL ACCOUNTING PRACTICES.*	63) The usual

[legal name of the audit firm]
[name and function of an authorised representative]
[dd Month yyyy]
<Signature of the Auditor>

ANNEX 6

MODEL FOR THE CERTIFICATE ON THE METHODOLOGY

For options [*in italics in square brackets*]: choose the applicable option. Options not chosen should be deleted.
For fields in [grey in square brackets]: enter the appropriate data.

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Terms of reference for an audit engagement for a methodology certificate in connection with one or more grant agreements financed under the Horizon 2020 Research and Innovation Framework Programme

This document sets out the '**Terms of Reference (ToR)**' under which

[OPTION 1: [insert name of the beneficiary] ('the Beneficiary')] [OPTION 2: [insert name of the linked third party] ('the Linked Third Party'), third party linked to the Beneficiary [insert name of the beneficiary] ('the Beneficiary')]

agrees to engage

[**insert legal name of the auditor**] ('the Auditor')

to produce an independent report of factual findings ('the Report') concerning the *[Beneficiary's] [Linked Third Party's]* usual accounting practices for calculating and claiming direct personnel costs declared as unit costs ('the Methodology') in connection with grant agreements financed under the Horizon 2020 Research and Innovation Framework Programme.

The procedures to be carried out for the assessment of the methodology will be based on the grant agreement(s) detailed below:

[title and number of the grant agreement(s)] ('the Agreement(s)')

The Agreement(s) has(have) been concluded between the Beneficiary and *[OPTION 1: the European Union, represented by the European Commission ('the Commission')][OPTION 2: the European Atomic Energy Community (Euratom,) represented by the European Commission ('the Commission')][OPTION 3: the [Research Executive Agency (REA)] [European Research Council Executive Agency (ERCEA)] [Innovation and Networks Executive Agency (INEA)] [Executive Agency for Small and Medium-sized Enterprises (EASME)] ('the Agency'), under the powers delegated by the European Commission ('the Commission').]*.

The *[Commission] [Agency]* is mentioned as a signatory of the Agreement with the Beneficiary only. The *[European Union] [Euratom] [Agency]* is not a party to this engagement.

1.1 Subject of the engagement

According to Article 18.1.2 of the Agreement, beneficiaries *[and linked third parties]* that declare direct personnel costs as unit costs calculated in accordance with their usual cost accounting practices may submit to the *[Commission] [Agency]*, for approval, a certificate on the methodology ('CoMUC') stating that there are adequate records and documentation to prove that their cost accounting practices used comply with the conditions set out in Point A of Article 6.2.

The subject of this engagement is the CoMUC which is composed of two separate documents:

- the Terms of Reference ('the ToR') to be signed by the *[Beneficiary] [Linked Third Party]* and the Auditor;

- the Auditor's Independent Report of Factual Findings ('the Report') issued on the Auditor's letterhead, dated, stamped and signed by the Auditor which includes; the standard statements ('the Statements') evaluated and signed by the *[Beneficiary] [Linked Third Party]*, the agreed-upon procedures ('the Procedures') performed by the Auditor and the standard factual findings

('the Findings') assessed by the Auditor. The Statements, Procedures and Findings are summarised in the table that forms part of the Report.

The information provided through the Statements, the Procedures and the Findings will enable the Commission to draw conclusions regarding the existence of the *[Beneficiary's] [Linked Third Party's]* usual cost accounting practice and its suitability to ensure that direct personnel costs claimed on that basis comply with the provisions of the Agreement. The Commission draws its own conclusions from the Report and any additional information it may require.

1.2 Responsibilities

The parties to this agreement are the *[Beneficiary] [Linked Third Party]* and the Auditor.

The *[Beneficiary] [Linked Third Party]:*

is responsible for preparing financial statements for the Agreement(s) ('the Financial Statements') in compliance with those Agreements;
is responsible for providing the Financial Statement(s) to the Auditor and enabling the Auditor to reconcile them with the *[Beneficiary's] [Linked Third Party's]* accounting and bookkeeping system and the underlying accounts and records. The Financial Statement(s) will be used as a basis for the procedures which the Auditor will carry out under this ToR;
is responsible for its Methodology and liable for the accuracy of the Financial Statement(s);
is responsible for endorsing or refuting the Statements indicated under the heading 'Statements to be made by the Beneficiary/ Linked Third Party' in the first column of the table that forms part of the Report;
must provide the Auditor with a signed and dated representation letter;
accepts that the ability of the Auditor to carry out the Procedures effectively depends upon the *[Beneficiary] [Linked Third Party]* providing full and free access to the *[Beneficiary's] [Linked Third Party's]* staff and to its accounting and other relevant records.

The Auditor:

[Option 1 by default: is qualified to carry out statutory audits of accounting documents in accordance with Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts, amending Council Directives 78/660/EEC and 83/349/EEC and repealing Council Directive 84/253/EEC or similar national regulations].
[Option 2 if the Beneficiary or Linked Third Party has an independent Public Officer: is a competent and independent Public Officer for which the relevant national authorities have established the legal capacity to audit the Beneficiary].
[Option 3 if the Beneficiary or Linked Third Party is an international organisation: is an [internal] [external] auditor in accordance with the internal financial regulations and procedures of the international organisation].

The Auditor:

must be independent from the Beneficiary *[and the Linked Third Party]*, in particular, it must not have been involved in preparing the Beneficiary's *[and Linked Third Party's]* Financial Statement(s);
must plan work so that the Procedures may be carried out and the Findings may be assessed;
must adhere to the Procedures laid down and the compulsory report format;
must carry out the engagement in accordance with these ToR;
must document matters which are important to support the Report;
must base its Report on the evidence gathered;
must submit the Report to the *[Beneficiary] [Linked Third Party]*.

The Commission sets out the Procedures to be carried out and the Findings to be endorsed by the Auditor. The Auditor is not responsible for their suitability or pertinence. As this engagement is not an assurance engagement the Auditor does not provide an audit opinion or a statement of assurance.

1.3 Applicable Standards

The Auditor must comply with these Terms of Reference and with[1]:

- the International Standard on Related Services ('ISRS') 4400 *Engagements to perform Agreed-upon Procedures regarding Financial Information* as issued by the International Auditing and Assurance Standards Board (IAASB);
- the *Code of Ethics for Professional Accountants* issued by the International Ethics Standards Board for Accountants (IESBA). Although ISRS 4400 states that independence is not a requirement for engagements to carry out agreed-upon procedures, the Commission requires that the Auditor also complies with the Code's independence requirements.

The Auditor's Report must state that there was no conflict of interests in establishing this Report between the Auditor and the Beneficiary *[and the Linked Third Party]* that could have a bearing on the Report, and must specify – if the service is invoiced - the total fee paid to the Auditor for providing the Report.

1.4 Reporting

The Report must be written in the language of the Agreement (see Article 20.7 of the Agreement).

Under Article 22 of the Agreement, the Commission, *[the Agency]*, the European Anti-Fraud Office and the Court of Auditors have the right to audit any work that is carried out under the action and for which costs are declared from *[the European Union] [Euratom]* budget. This includes work related to this engagement. The Auditor must provide access to all working papers related to this assignment if the Commission*[, the Agency]*, the European Anti-Fraud Office or the European Court of Auditors requests them.

1.5 Timing

The Report must be provided by [dd Month yyyy].

1.6 Other Terms

[The [Beneficiary] [Linked Third Party] and the Auditor can use this section to agree other specific terms, such as the Auditor's fees, liability, applicable law, etc. Those specific terms must not contradict the terms specified above.]

[legal name of the Auditor]	[legal name of the [Beneficiary] [Linked Third Party]]
[name & title of authorised representative]	[name & title of authorised representative]
[dd Month yyyy]	[dd Month yyyy]
Signature of the Auditor Signature	Signature of the *[Beneficiary] [Linked Third Party]*

[1] Supreme Audit Institutions applying INTOSAI-standards may carry out the Procedures according to the corresponding International Standards of Supreme Audit Institutions and code of ethics issued by INTOSAI instead of the International Standard on Related Services ('ISRS') 4400 and the Code of Ethics for Professional Accountants issued by the IAASB and the IESBA.

Independent report of factual findings on the methodology concerning grant agreements financed under the Horizon 2020 Research and Innovation Framework Programme

(To be printed on letterhead paper of the auditor)

To
[name of contact person(s)], [Position]
[[Beneficiary's] [Linked Third Party's] name]
[Address]
[dd Month yyyy]

Dear [Name of contact person(s)],

As agreed under the terms of reference dated [dd Month yyyy]

with *[OPTION 1: [insert name of the beneficiary] ('the Beneficiary')] [OPTION 2: [insert name of the linked third party] ('the Linked Third Party'), third party linked to the Beneficiary [insert name of the beneficiary] ('the Beneficiary')]*,

we

[name of the auditor] ('the Auditor'),

established at

[full address/city/state/province/country],

represented by

[name and function of an authorised representative],

have carried out the agreed-upon procedures ('the Procedures') and provide hereby our Independent Report of Factual Findings ('the Report'), concerning the *[Beneficiary's] [Linked Third Party's]* usual accounting practices for calculating and declaring direct personnel costs declared as unit costs ('the Methodology').

You requested certain procedures to be carried out in connection with the grant(s)

[title and number of the grant agreement(s)] ('the Agreement(s)').

The Report

Our engagement was carried out in accordance with the terms of reference ('the ToR') appended to this Report. The Report includes: the standard statements ('the Statements') made by the *[Beneficiary] [Linked Third Party]*, the agreed-upon procedures ('the Procedures') carried out and the standard factual findings ('the Findings') confirmed by us.

The engagement involved carrying out the Procedures and assessing the Findings and the documentation requested appended to this Report, the results of which the Commission uses to draw conclusions regarding the acceptability of the Methodology applied by the *[Beneficiary] [Linked Third Party]*.

The Report covers the methodology used from [dd Month yyyy]. In the event that the *[Beneficiary] [Linked Third Party]* changes this methodology, the Report will not be applicable to any Financial Statement[1] submitted thereafter.

The scope of the Procedures and the definition of the standard statements and findings were determined solely by the Commission. Therefore, the Auditor is not responsible for their suitability or pertinence.

Since the Procedures carried out constitute neither an audit nor a review made in accordance with International Standards on Auditing or International Standards on Review Engagements, we do not give a statement of assurance on the costs declared on the basis of the *[Beneficiary's] [Linked Third Party's]* Methodology. Had we carried out additional procedures or had we performed an audit or review in accordance with these standards, other matters might have come to its attention and would have been included in the Report.

Exceptions

Apart from the exceptions listed below, the *[Beneficiary] [Linked Third Party]* agreed with the standard Statements and provided the Auditor all the documentation and accounting information needed by the Auditor to carry out the requested Procedures and corroborate the standard Findings.

List here any exception and add any information on the cause and possible consequences of each exception, if known. If the exception is quantifiable, also indicate the corresponding amount.

…..

Explanation of possible exceptions in the form of examples (to be removed from the Report):

i. the [Beneficiary] [Linked Third Party] did not agree with the standard Statement number … because…;

ii. the Auditor could not carry out the procedure … established because …. (e.g. due to the inability to reconcile key information or the unavailability or inconsistency of data);

iii. the Auditor could not confirm or corroborate the standard Finding number … because ….

Remarks

We would like to add the following remarks relevant for the proper understanding of the Methodology applied by the [Beneficiary] [Linked Third Party] or the results reported:

Example (to be removed from the Report):

Regarding the methodology applied to calculate hourly rates …

Regarding standard Finding 15 it has to be noted that …

The [Beneficiary] [Linked Third Party] explained the deviation from the benchmark statement XXIV concerning time recording for personnel with no exclusive dedication to the action in the following manner:

…

Annexes

Please provide the following documents to the auditor and annex them to the report when submitting this CoMUC to the Commission:

[1] Financial Statement in this context refers solely to Annex 4 of the Agreement by which the Beneficiary declares costs under the Agreement.

1. Brief description of the methodology for calculating personnel costs, productive hours and hourly rates;
2. Brief description of the time recording system in place;
3. An example of the time records used by the [*Beneficiary] [Linked Third Party*];
4. Description of any budgeted or estimated elements applied, together with an explanation as to why they are relevant for calculating the personnel costs and how they are based on objective and verifiable information;
5. A summary sheet with the hourly rate for direct personnel declared by the [*Beneficiary*] [*Linked Third Party*] and recalculated by the Auditor for each staff member included in the sample (the names do not need to be reported);
6. A comparative table summarising for each person selected in the sample a) the time claimed by the [*Beneficiary*] [*Linked Third Party*] in the Financial Statement(s) and b) the time according to the time record verified by the Auditor;
7. A copy of the letter of representation provided to the Auditor.

Use of this Report

This Report has been drawn up solely for the purpose given under Point 1.1 Reasons for the engagement.

The Report:

- is confidential and is intended to be submitted to the Commission by the [*Beneficiary*] [*Linked Third Party*] in connection with Article 18.1.2 of the Agreement;
- may not be used by the [*Beneficiary*] [*Linked Third Party*] or by the Commission for any other purpose, nor distributed to any other parties;
- may be disclosed by the Commission only to authorised parties, in particular the European Anti-Fraud Office (OLAF) and the European Court of Auditors.
- relates only to the usual cost accounting practices specified above and does not constitute a report on the Financial Statements of the [*Beneficiary*] [*Linked Third Party*].

No conflict of interest [2] exists between the Auditor and the Beneficiary *[and the Linked Third Party*] that could have a bearing on the Report. The total fee paid to the Auditor for producing the Report was EUR _____ (including EUR _____ of deductible VAT).

We look forward to discussing our Report with you and would be pleased to provide any further information or assistance which may be required.

Yours sincerely

[legal name of the Auditor]
[name and title of the authorised representative]
[dd Month yyyy]
Signature of the Auditor

[2] A conflict of interest arises when the Auditor's objectivity to establish the certificate is compromised in fact or in appearance when the Auditor for instance:
- was involved in the preparation of the Financial Statements;
- stands to benefit directly should the certificate be accepted;
- has a close relationship with any person representing the beneficiary;
- is a director, trustee or partner of the beneficiary; or
- is in any other situation that compromises his or her independence or ability to establish the certificate impartially.

Statements to be made by the Beneficiary/Linked Third Party ('the Statements') and Procedures to be Procedures') and standard factual findings ('the Findings') to be confirmed by the Auditor

The Commission reserves the right to provide the auditor with guidance regarding the Statements to be made Findings to be ascertained and the way in which to present them. The Commission reserves the right to vary the Staten written notification to the Beneficiary/Linked Third Party to adapt the procedures to changes in the grant agreement(s)

If this methodology certificate relates to the Linked Third Party's usual accounting practices for calculating and claimi unit costs any reference here below to 'the Beneficiary' is to be considered as a reference to 'the Linked Third Party'.

Please explain any discrepancies in the body of the Report.	
Statements to be made by Beneficiary	**Procedures to be carried out and Finding**
A. Use of the Methodology I. The cost accounting practice described below has been in use since *[*dd Month yyyy*]*. II. The next planned alteration to the methodology used by the Beneficiary will be from [dd Month yyyy*]*.	**Procedure:** The Auditor checked these dates ag has provided. **Factual finding:** 1. The dates provided by the I documentation.
B. Description of the Methodology III. The methodology to calculate unit costs is being used in a consistent manner and is reflected in the relevant procedures. *[Please describe the methodology your entity uses to calculate personnel costs, productive hours and hourly rates, present your description to the Auditor and annex it to this certificate]* *[If the statement of section "B. Description of the methodology" cannot be endorsed by the Beneficiary or there is no written methodology to calculate unit costs it should be listed here below and reported as exception by the Auditor in the main Report of Factual Findings:* - *...]*	**Procedure:** The Auditor reviewed the descripti guidance documents describing the **Factual finding:** 2. The brief description was consis guidance and/or other documentary 3. The methodology was generally usual costs accounting practices.
C. **Personnel costs** General	**Procedure:** *The Auditor draws a sample of employees t*

Please explain any discrepancies in the body of the Report.	
Statements to be made by Beneficiary	**Procedures to be carried out and Finding**
IV. The unit costs (hourly rates) are limited to salaries including during parental leave, social security contributions, taxes and other costs included in the remuneration required under national law and the employment contract or equivalent appointing act;	*this section C and the following sections D [The Auditor has drawn a random samp employees assigned to the action(s). If f assigned to the action(s), the Auditor equivalents consisting of all employees assi other employees irrespective of their assign*
V. Employees are hired directly by the Beneficiary in accordance with national law, and work under its sole supervision and responsibility;	
VI. The Beneficiary remunerates its employees in accordance with its usual practices. This means that personnel costs are charged in line with the Beneficiary's usual payroll policy (e.g. salary policy, overtime policy, variable pay) and no special conditions exist for employees assigned to tasks relating to the European Union or Euratom, unless explicitly provided for in the grant agreement(s);	the Auditor reviewed all docume employment contracts, payslips, pa policy, variable pay policy), acc national tax , labour and social corroborating the personnel costs c
VII. The Beneficiary allocates its employees to the relevant group/category/cost centre for the purpose of the unit cost calculation in line with the usual cost accounting practice;	in particular, the Auditor revie employees in the sample to verify
VIII. Personnel costs are based on the payroll system and accounting system.	i. they were employed directl applicable national legislation
IX. Any exceptional adjustments of actual personnel costs resulted from relevant budgeted or estimated elements and were based on objective and verifiable information. *[Please describe the 'budgeted or estimated elements' and their relevance to personnel costs, and explain how they were reasonable and based on objective and verifiable information, present your explanation to the Auditor and annex it to this certificate].*	ii. they were working under responsibility of the latter;
	iii. they were remunerated in a practices;
	iv. they were allocated to the purposes of calculating the usual cost accounting practice
X. Personnel costs claimed do not contain any of the following ineligible costs: costs related to return on capital; debt and debt service charges; provisions for future losses or debts; interest owed; doubtful debts; currency exchange losses; bank costs charged by the Beneficiary's bank for transfers from the Commission/Agency; excessive or reckless expenditure; deductible VAT or costs incurred during suspension of the implementation of the action.	the Auditor verified that any in other costs categories or costs cove grants financed from the European account when calculating the perso
	the Auditor numerically reconciled to calculate the unit cost with the t in the statutory accounts and the pa
XI. Personnel costs were not declared under another EU or Euratom grant (including grants awarded by a Member State and financed by the EU budget and grants awarded by bodies other than the Commission/Agency for the purpose of implementing the EU budget).	to the extent that actual personn budgeted or estimated elements, elements and checked the info correspond to objective and verifia

Please explain any discrepancies in the body of the Report.	
Statements to be made by Beneficiary	**Procedures to be carried out and Finding**
<u>If additional remuneration as referred to in the grant agreement(s) is paid</u> XII. The Beneficiary is a non-profit legal entity; XIII. The additional remuneration is part of the beneficiary's usual remuneration practices and paid consistently whenever the relevant work or expertise is required; XIV. The criteria used to calculate the additional remuneration are objective and generally applied regardless of the source of funding; XV. The additional remuneration included in the personnel costs used to calculate the hourly rates for the grant agreement(s) is capped at EUR 8 000 per full-time equivalent (reduced proportionately if the employee is not assigned exclusively to the action). *[If certain statement(s) of section "C. Personnel costs" cannot be endorsed by the Beneficiary they should be listed here below and reported as exception by the Auditor in the main Report of Factual Findings:* - *...]*	if additional remuneration has b Beneficiary was a non-profit leg EUR 8 000 per full-time equivalen for employees not assigned exclusi the Auditor recalculated the per sample. **Factual finding:** 4. All the components of the remuner costs are supported by underlying 5. The employees in the sample were accordance with applicable natio supervision and responsibility. 6. Their employment contracts wer policy; 7. Personnel costs were duly docur social security contributions (p unemployment fund contributions included in the remuneration (holi 8. The totals used to calculate the per registered in the payroll and accou 9. To the extent that actual person budgeted or estimated element calculating the personnel costs a information. The budgeted or estin elements and their values). 10. Personnel costs contained no ineli 11. Specific conditions for eligib remuneration was paid: a) the agreements as a non-profit legal en criteria generally applied regardl remuneration was capped at EUR 8 to the equivalent pro-rata amount i full-time during the year or did not

Please explain any discrepancies in the body of the Report.	
Statements to be made by Beneficiary	**Procedures to be carried out and Finding**
D. Productive hours XVI. The number of productive hours per full-time employee applied is *[delete as appropriate]*: A. 1720 productive hours per year for a person working full-time (corresponding pro-rata for persons not working full time). B. the total number of hours worked in the year by a person for the Beneficiary C. the standard number of annual hours generally applied by the beneficiary for its personnel in accordance with its usual cost accounting practices. This number must be at least 90% of the standard annual workable hours. <u>If method B is applied</u> XVII. The calculation of the total number of hours worked was done as follows: annual workable hours of the person according to the employment contract, applicable labour agreement or national law plus overtime worked minus absences (such as sick leave and special leave). XVIII. 'Annual workable hours' are hours during which the personnel must be working, at the employer's disposal and carrying out his/her activity or duties under the employment contract, applicable collective labour agreement or national working time legislation. XIX. The contract (applicable collective labour agreement or national working time legislation) do specify the working time enabling to calculate the annual workable hours. <u>If method C is applied</u> XX. The standard number of productive hours per year is that of a full-time equivalent. XXI. The number of productive hours per year on which the hourly rate is based i) corresponds to the Beneficiary's usual accounting practices; ii) is at least 90% of the standard number of workable (working) hours per year. XXII. Standard workable (working) hours are hours during which personnel are at	**Procedure (same sample basis as for Sect** The Auditor verified that the nu accordance with method A, B or C The Auditor checked that the nu employee is correct. If method B is applied the Auditor number of hours worked was de annual workable hours by inspe legislation, labour agreements and If method C is applied the Aud standard number of working ho inspecting all the relevant do agreements and contracts and verif per year used for these calculations of working hours per year. **Factual finding:** <u>General</u> 12. The Beneficiary applied a numb method A, B or C detailed in the le 13. The number of productive hours accurate. <u>If method B is applied</u> 14. The number of 'annual workab verifiable based on the documen calculation of the total number of h 15. The contract specified the worki workable hours. <u>If method C is applied</u> 16. The calculation of the number of p the usual costs accounting practice

Please explain any discrepancies in the body of the Report.	
Statements to be made by Beneficiary	**Procedures to be carried out and Finding**
the Beneficiary's disposal preforming the duties described in the relevant employment contract, collective labour agreement or national labour legislation. The number of standard annual workable (working) hours that the Beneficiary claims is supported by labour contracts, national legislation and other documentary evidence. *[If certain statement(s) of section "D. Productive hours" cannot be endorsed by the Beneficiary they should be listed here below and reported as exception by the Auditor:* - *...]*	17. The calculation of the standard year was corroborated by the docu 18. The number of productive hours hourly rate was at least 90 % of the year.
E. Hourly rates The hourly rates are correct because: XXIII. Hourly rates are correctly calculated since they result from dividing annual personnel costs by the productive hours of a given year and group (e.g. staff category or department or cost centre depending on the methodology applied) and they are in line with the statements made in section C. and D. above. *[If the statement of section 'E. Hourly rates' cannot be endorsed by the Beneficiary they should be listed here below and reported as exception by the Auditor:* - *...]*	**Procedure** The Auditor has obtained a list Beneficiary in accordance with the The Auditor has obtained a list which the personnel rate(s) are calc For 10 full-time equivalent employees se Section C: Personnel costs): The Auditor recalculated the hourl The Auditor verified that the metho accounting practices of the orga activities of the organisation on the the source of funding. **Factual finding:** 19. No differences arose from the r employees included in the sample.
F. Time recording XXIV. Time recording is in place for all persons with no exclusive dedication to one Horizon 2020 action. At least all hours worked in connection with the grant agreement(s) are registered on a **daily/weekly/monthly** basis *[delete as appropriate]* using a **paper/computer-based system** *[delete as appropriate]*; XXV. For persons exclusively assigned to one Horizon 2020 activity the	**Procedure** The Auditor reviewed the brief internal guidance describing the m The Auditor reviewed the time records equivalents referred to under Section C: Per

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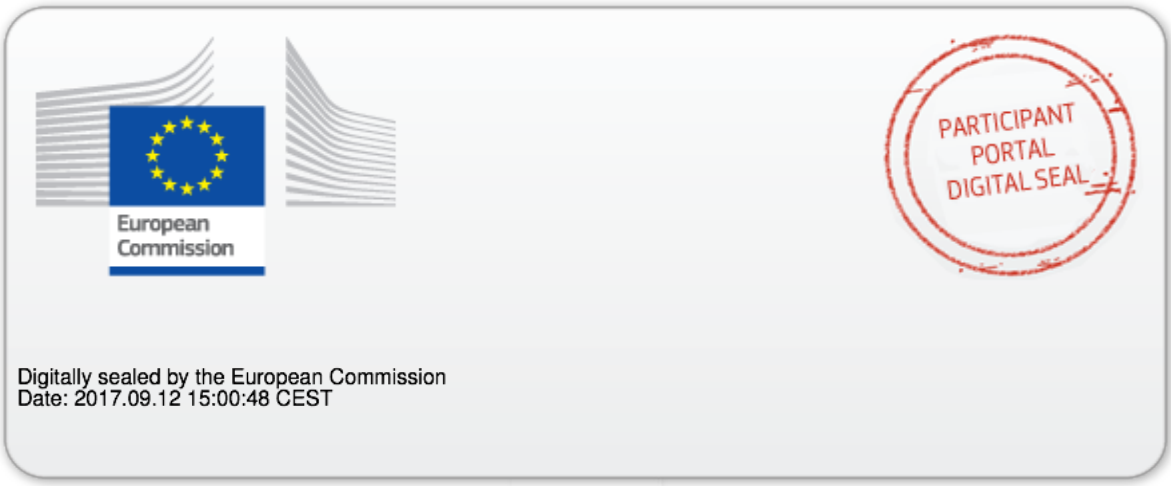
Statements to be made by Beneficiary	**Procedures to be carried out and Finding**
Beneficiary has either signed a declaration to that effect or has put arrangements in place to record their working time; XXVI. Records of time worked have been signed by the person concerned (on paper or electronically) and approved by the action manager or line manager at least monthly; XXVII. Measures are in place to prevent staff from: i. recording the same hours twice, ii. recording working hours during absence periods (e.g. holidays, sick leave), iii. recording more than the number of productive hours per year used to calculate the hourly rates, and iv. recording hours worked outside the action period. XXVIII. No working time was recorded outside the action period; XXIX. No more hours were claimed than the productive hours used to calculate the hourly personnel rates. *[Please provide a brief description of the time recording system in place together with the measures applied to ensure its reliability to the Auditor and annex it to the present certificate[1]].* *[If certain statement(s) of section "F. Time recording" cannot be endorsed by the Beneficiary they should be listed here below and reported as exception by the*	that time records were availab assignment to the action; that time records were available Horizon 2020 action, or, alterna Beneficiary was available for t exclusively for a Horizon 2020 act that time records were signed minimum requirements were fulfil that the persons worked for the act that no more hours were claimed t the hourly personnel rates; that internal controls were in place during absences for holidays or sic person per year for Horizon 202 hours per year used to calculate recorded outside the action period; the Auditor cross-checked the info verify consistency and to ensur effective. In addition, the Audito charged to Horizon 2020 actions productive hours per year used to c no time worked outside the action **Factual finding:** 20. The brief description, manuals a provided by the Beneficiary

[1] The description of the time recording system must state among others information on the content of the time records, its covera personnel or only for personnel involved in H2020 actions), its degree of detail (whether there is a reference to the particular tas the time registration and authorisation (paper or a computer-based system; on a daily, weekly or monthly basis; signed and cour prevent double-charging of time or ensure consistency with HR-records such as absences and travels as well as it information fl Financial Statements.

Please explain any discrepancies in the body of the Report.	
Statements to be made by Beneficiary	**Procedures to be carried out and Finding**
Auditor: - *...]*	reports/records and other docume by the Beneficiary to produce the f 21. For the random sample time wa working exclusively for the acti records were available; 22. For the random sample the time re the action manager/line manager, a 23. Working time claimed for the actio 24. No more hours were claimed th calculate the hourly personnel rate 25. There is proof that the Beneficiary been claimed twice, that it is co number of productive hours per claimed outside the action period. 26. Working time claimed is consist resources department.

[official name of the *[Beneficiary] [Linked Third Party]**]***
[name and title of authorised representative]
[dd Month yyyy]
*<**Signature of the** [Beneficiary] [Linked Third Party]>*

[official name of the Auditor]
[name and title of authorised representa
[dd Month yyyy]
*<**Signature** of the Auditor>*



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