



Senator

**Smart network operator platform
enabling shared, integrated and
more sustainable urban freight
logistic**

[D6. 13] IPR and Knowledge Management
strategy Report 3 (Public)



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Table of contents

Document Contributors	1
Document History	1
Table of contents	2
List of abbreviations	4
List of definitions.	4
1 Executive Summary	5
1.1 Introduction	5
1.2 Key Exploitable Results	5
1.3 IPR & knowledge strategy after project completion	6
2 Introduction	8
2.1 Purpose	8
2.2 Relation to other project documents	8
2.3 Structure of deliverable	8
3 IPR and Knowledge Management Strategy	9
3.1 Established intellectual property regime: European legislation	9
3.2 Definition, procedures and agreements included in the CA	10
3.2.1 Background identification and access rights	10
3.2.2 License Agreements for the implementation of the project	10
3.2.3 Individual and joint ownership	10
3.2.4 Transfer of Results	11
3.2.5 Dissemination of results	11
3.3 The role of the Exploitation Board	12
3.4 IPR post-project obligations	12
4 Background IP identified at the start of the project	14
4.1 Identification of background IP	14
4.2 Partner 1. SOCIEDAD ESTATAL CORREOS Y TELÉGRAFOS, S.A (CORREOS)	14
4.3 PARTNER 5. SOFTWARE AG (SAG)	16
5 Exploitation Plan	21
5.1 The direct Key Exploitable Results	21
5.2 Operational logistics planning tool (KER1)	22

5.3 Strategic planning tool/transport model for urban logistics (KER2)	22
5.3.1 Strategic planning tool for urban logistics	22
5.3.2 Urban freight transport model	23
5.4 Route training tool for urban logistics (KER3)	23
5.5 Key policy lessons on collaboration (KER4)	24
6 IPR & knowledge strategy after project completion	25
6.1 Introduction.....	25
6.2 What has been created.....	25
6.3 Conclusion	26

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List of abbreviations

Abbreviation	Description
CA	Consortium Agreement
EB	Exploitation Board
GA	Grant Agreement
KER	Key Exploitable Result
IP	Intellectual and Industrial Property
IPR	Intellectual and Industrial Property Rights.
MDST	MDS Transmodal
TRL	Technology Readiness Level

List of definitions.

Background IP: Set of knowledge and experiences of a partner that already exists prior to the project starting that is needed to implement the action or exploit the results. This could be data, know-how or information.

Foreground IP: Set of knowledge and experiences expected to be produced during the project development from the partner's background IP. This could be data, know-how or information.

1 Executive Summary

1.1 Introduction

The main purpose of this deliverable is to set out an IPR and Knowledge Management Strategy for the results of the SENATOR project beyond the end of the project in February 2025.

The work of the Exploitation Board led to four direct Key Exploitable Results (KERs), which have been developed jointly by the consortium during the SENATOR Project. These KERs, which are summarised below, are focused on how what has been created could be used, create value and have commercial value (although there is also an emphasis on policy lessons which should be learnt from the project).

1.2 Key Exploitable Results

The key sources of innovation that are direct Key Exploitable Results and were defined in Deliverable 6.15 are summarised in the following table.

Direct Result (KER)	Key Exploitable	Target stakeholders	Description of direct KER	Technology Readiness Level (TRL)
1. Operational logistics planning tool		Logistics operators	As a prototype the SENATOR Platform allows logistics operators to plan daily deployment of vehicles and delivery staff based on optimised routings. Again, as a prototype, the SENATOR Platform also provides the technical capability for several different logistics operators to collaborate to make optimised deliveries.	7
2. Strategic planning tool/transport model for urban logistics		Logistics operators & city authorities	As a prototype, the SENATOR Platform has the potential to allow logistics operators to test the impact of new operational strategies or regulatory regimes on their operations before implementation at street-level in a particular city. Similarly, it allows city authorities to test the impact of new regulatory regimes on city logistics operations before implementation at street-level in a particular city as part of the development of the cities' Strategic Urban Logistics Plans (SULPs).	5
3. Route training tool for urban logistics		Logistics operators	The SENATOR Platform, with some further development, could also allow transport operators to train delivery staff on the optimal	5

				routes they should follow, both in advance of carrying out the deliveries at street-level, or on their delivery rounds, in a particular city ¹ .
4.	Key lessons on collaboration in logistics	policy	Policymakers	The SENATOR project highlighted some key policy issues that emerged during the attempted implementation of collaborative logistics approaches in the Urban Living Labs, highlighting some key commercial and legal barriers that technology cannot easily resolve.

KER1 has been developed in the project to prototype level (TRL7), whereas KER2 and KER3 (which were not the actual objectives of the project) have been validated in a relevant environment (TRL5). KER4 is related to policy and so no TRL is relevant.

Further details of each of these four KERs are provided below.

1.3 IPR & knowledge strategy after project completion

The main innovation/invention of the SENATOR project that leads to the KERs has been the SENATOR Platform, which is made of several parts:

- Back end to SENATOR Platform: allows data to be input into the software platform and problems to be posed;
- Algorithm for SENATOR Platform: allows the platform to solve optimisation problems;
- Messaging bus for SENATOR Platform: allows the software platform to communicate with (receive input data from and send outputs to) a range of stakeholders; and
- Dashboard for SENATOR Platform: visualises outputs (the results from the software platform) both geographically and in terms of Key Performance Indicators (KPIs).

Several of the partners believe they have made some direct contribution to the development of the main invention of the project (the SENATOR Platform) through the provision of data, cost models, facilitating testing in the Urban Living Labs. They therefore believe they might be able to claim a proportion of the ownership of the SENATOR platform. However, none of these partners intend to pursue any potential IP rights in any practical way.

The main elements of the SENATOR Platform are, in any case, only available in any practical sense to the three partners who were mainly responsible for their development during the project and other partners do not have a copy of them. The relevant partners are as follows:

- DEUSTO: back-end to, and algorithm for, the SENATOR Platform;

¹ Although it should be noted that the Platform is designed to optimize delivery rounds depending on the distribution of deliveries on any given day and so the precise route will vary from day to day.

- Software AG: messaging bus for the SENATOR Platform; and
- DotGIS: dashboard for the SENATOR Platform.

None of the partners are intending to take action to formally protect their IP, even though most partners are interested in exploiting (including commercially) the results of the project – both their own results and, in some cases, the SENATOR Platform itself. It is possible this will result in discussions between some partners about exploiting the SENATOR Platform after the project has ended.

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2 Introduction

2.1 Purpose

The main purpose of this deliverable is to set out an IPR and Knowledge Management Strategy for the results of the SENATOR project beyond the end of the project in February 2025.

2.2 Relation to other project documents

Deliverable D6.12 has been prepared by MDS Transmodal (MDST) with the contribution of all partners. This deliverable is also reliant on the content of the Grant Agreement (GA) and Consortium Agreement (CA) documents which define how IPR will be dealt with during and after the project.

2.3 Structure of deliverable

This final IPR and Knowledge Management Strategy for the SENATOR project (Deliverable 6.13) includes the following:

- An overview of the relevant European Union legislation and, more specifically, the terms in the Grant Agreement and the Consortium Agreement for the SENATOR Project that regulate IPR and Knowledge Management after the SENATOR project ends (section 3);
- A definition of the Background IP that was brought into the project by some of the partners and which may affect the IPR and Knowledge Management Strategy after the end of the project (section 4): this was defined as part of the Consortium Agreement before the project officially started;
- A summary of the Exploitation Plan that is set out in more detail in Deliverable D6.15, with a focus on the direct Key Exploitable Results (KERs) that have been jointly developed by the partners in the project (section 5); and
- A description of the optimal IPR and knowledge protection options for the direct KERs, in line with the obtained results and the intentions of the individual partners (section 6).

In this confidential version of the Strategy, the results of a survey of partners' views and intentions in relation to IPR beyond the end of the project are set out in an Appendix.

3 IPR and Knowledge Management Strategy

3.1 Established intellectual property regime: European legislation

The IPR and Knowledge Management Strategy for the SENATOR project was developed in accordance with the current version of the Grant Agreement (GA) and the Consortium Agreement (CA) established in the project. These are based, in turn on the following EU legislation:

- Directive (EU) 2015/2436 of the European Parliament and of the Council of 16 December 2015 to approximate the laws of the Member States relating to trade marks (Text with EEA relevance) ([Link](#))
- Regulation (EU) 2017/1001 of the European Parliament and of the Council of 14 June 2017 on the European Union trade mark (Text with EEA relevance.) ([Link](#))
- Directive 98/71/EC of the European Parliament and of the Council of 13 October 1998 on the legal protection of designs ([Link](#))
- Council Regulation (EC) No 6/2002 of 12 December 2001 on Community designs ([Link](#))
- Council Regulation (EC) No 1891/2006 of 18 December 2006 amending Regulations (EC) No 6/2002 and (EC) No 40/94 to give effect to the accession of the European Community to the Geneva Act of the Hague Agreement concerning the international registration of industrial designs ([Link](#))
- COM (1997) 628: Proposal for a European Parliament and Council Directive on the harmonization of certain aspects of copyright and related rights in the Information Society ([Link](#))
- Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (Text with EEA relevance.) ([Link](#))
- Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases ([Link](#))

3.2 Definition, procedures and agreements included in the CA

Some of the most relevant agreements in relation to IPR are included in the CA, regarding the identification of background IP and access rights, license agreements for the implementation of the project, individual and joint ownership of results, transfer of results and dissemination of results. These are summarised in the following sub-sections.

3.2.1 Background identification and access rights

The implementation of the tasks within the different Work Packages of the SENATOR project imply that some partners needed to give access rights to their background IPR and results that have been created so that other partners could carry out their work on the project and/or exploit their results. CA Article 9 includes the agreements made by the partners of SENATOR regarding the access rights to these results.

3.2.2 License Agreements for the implementation of the project

The License Agreements for the implementation of the project are governed by CA Article 8.2, which states that the Licence Agreement Parties acknowledge and agree that all IP belonging to each Licensor belongs to that Licensor and nothing in this Licence Agreement confers any right, title or interest in any IP belonging to any Licence Agreement Party on the other Licence Agreement Party. The parties recognise the exclusive property rights to the developments. In this sense, participation in the project does not give them any right to apply for patents and models or use the other party's property.

3.2.3 Individual and joint ownership

The individual and joint ownership of results is governed by CA Articles 8.1 and 8.3.

3.2.3.1 Individual ownership

The individual ownership of results is governed by CA Article 8.1, which states that the results are owned by the Party that generates them.

3.2.3.2 Joint ownership

The joint ownership of results is governed by CA Article 8.3. This states that, if, while carrying out work on the Project, Results are generated and two or more Parties (the "Joint Owners" or their Affiliates or other persons working on their behalf) contributed to it, and if the contributions to or features of such Results form an indivisible part thereof, such that under applicable law it is not possible to separate them for the purpose of applying for, obtaining and/or maintaining and/or owning the relevant patent protection or any other IPR protecting or available to protect such Results, the Joint Owners agree that all patents and

other registered IPRs issued thereon, and any other IPRs protecting such Results, shall be jointly owned by the Joint Owners.

Within a reasonable period following creation of any jointly owned Results, the Joint Owners shall enter into good faith discussions in order to agree on an appropriate course of action for filing applications for patent protection or other protection, including the decision as to which Contributor is to be entrusted with the preparation, filing and prosecution of such applications and in which countries or territories such applications are to be filed.

3.2.4 Transfer of Results

The transfer of results is governed by CA Article 8.4, which states that each Party may transfer ownership of its own results to a third party.

3.2.5 Dissemination of results

CA Article 8.5 regulates the dissemination of results and includes the procedures and limitations regarding the dissemination of other participants' results or background IP.

A specific consideration will be paid here because of the presence of academic partners in the consortium. Thus, for the disclosure of project results, partners will select the appropriate means (e.g. scientific publications, publication on web sites, conferences, open access, etc.) according to the conditions set out in the CA and in other specific confidentiality agreements in order to maintain confidentiality during and even after the end of the project when applicable.

The SENATOR project also sought to have a business-oriented approach, placing as much emphasis in Work Package 6 Business Models (Deliverable D6.6) on turning SENATOR's expected research outcomes and technological developments into value creating products and/or services. Additionally to the WP6 deliverables, Work Package 7 also developed the means to help partners to establish the bases for their IP strategy and dissemination activities.

3.2.5.1 Maintaining confidentiality

Written or oral information given to a person who is not bound by the secrecy or confidentiality obligations of the SENATOR Project constitutes a disclosure. In such cases, disclosures could be detrimental to future filings for protection of project results. Thereafter, it is vital to keep information confidential, mainly with regard to those project results for which registration has not been completed or decided upon as yet. In any case, having a proper management system in place within each partner's organisational structure ensures the compliance with the confidentiality obligations set by the consortium.

3.2.5.2 Open access to scientific publications

According to GA Article 29.2, each participant must ensure open access (that is online access, which is free of charge for any user) to all peer-reviewed scientific publications relating to its Horizon 2020 project's results. This does not mean that partners have the obligation to publish their results, nor does this affect their plans for exploitation. In fact, partners must first decide on the protection of their results and, once the decision is taken, consider if and when dissemination should be carried out through scientific publication.

3.3 The role of the Exploitation Board

The Exploitation Board consisted of representatives of all Parties in the Consortium and was responsible for the development and implementation of the Project's exploitation strategy and coordination of the innovation management. It was responsible for the coordination of the exploitation strategy of the project (as set out in Task 6.4), aiming to define a clear exploitation roadmap based on the definition of joint and individual exploitation plans.

Meeting roughly every six months from October 2022 until the end of the project, the Exploitation Board had the following responsibilities:

- Coordinating the project exploitation strategy according to the business model defined by the cooperation of the Parties;
- Identifying and promoting economic exploitation of the results, ensuring an overall Exploitation Plan fitting all Parties' interests;
- Assessing exploitable results, detecting and adapting changes taking place in the material technologies involved and evaluating changes in the market;
- Ensuring adequate IPR protection, licensing and knowledge transfer of the project results.

3.4 IPR post-project obligations

Opinions expressed by the Exploitation Board (EB), created by common agreement among all partners, for the monitoring and non-binding advice on IPR and knowledge generated from the project, have been for information only. The SENATOR Project Coordinator has no responsibility for such opinions and / or advice provided by the EB.

Following the end of the project, the costs of registering patents, utility models and creations, or its renewal and management, will be directly related to the participation percentages and the exploitation rights of each creator agreed at the end of the project and in no case will they be assumed by either the EB or the Project Coordinator.

The creator, or creators, of IP during the project will be responsible for the registration and management of the patents, utility models or creations generated, so that any other costs derived from mismanagement of the IP created during the project will not be the responsibility of the Project Coordinator or the EB and will lie with the creators themselves who are ultimately responsible for these obligations.

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4 Background IP identified at the start of the project

4.1 Identification of background IP

Two partners in the project – Correos and Software AG - specifically identified background IP that they would be using within the project. This background IP is set out below.

4.2 Partner 1. SOCIEDAD ESTATAL CORREOS Y TELÉGRAFOS, S.A (CORREOS)

It is agreed between the partners that, to the best of their knowledge, the following background IP is hereby identified and agreed upon for the project. Specific limitations and/or conditions, shall be as mentioned hereunder:

Describe Background	Specific limitations and/or conditions for implementation (Article 25.1 and 25.2 Grant Agreement)	Specific limitations and/or conditions for Exploitation (Article 25.3 Grant Agreement)
OCA, SICER, Mercurio	Access Rights to Background are limited to the project implementation based on specific information needed by other Parties in the context of work plan as defined in the Annex I of the Grant Agreement. The information shall be requested previously by each Party. Access rights not royalty free to be agreed with other Parties	Limitations and conditions for implementations apply accordingly under “Fair and reasonable conditions stated at article 25.3 Grant Agreement”. Access rights not royalty free to be agreed with other Parties
Traceability tool: SICER	Access Rights to Background are limited to the project implementation based on specific information needed by other Parties in the context of work plan as defined in the Annex I of the Grant Agreement. The information shall be requested previously by each Party. Access rights not royalty free to be agreed with other Parties	Limitations and conditions for implementations apply accordingly under “Fair and reasonable conditions stated at article 25.3 Grant Agreement”.

Describe Background	Specific limitations and/or conditions for implementation (Article 25.1 and 25.2 Grant Agreement)	Specific limitations and/or conditions for Exploitation (Article 25.3 Grant Agreement)
Traceability tool: Mercurio	Access Rights to Background are limited to the project implementation based on specific information needed by other Parties in the context of work plan as defined in the Annex I of the Grant Agreement. The information shall be requested previously by each Party. Access rights not royalty free to be agreed with other Parties	Limitations and conditions for implementations apply accordingly under “Fair and reasonable conditions stated at article 25.3 Grant Agreement”.
Traceability tool: Lince	Access Rights to Background are limited to the project implementation based on specific information needed by other Parties in the context of work plan as defined in the Annex I of the Grant Agreement. The information shall be requested previously by each Party. Access rights not royalty free to be agreed with other Parties	Limitations and conditions for implementations apply accordingly under “Fair and reasonable conditions stated at article 25.3 Grant Agreement”.

4.3 PARTNER 5. SOFTWARE AG (SAG)

It is agreed between the partners that, to the best of their knowledge, the following background IP is hereby identified and agreed upon for the Project. Specific limitations and/or conditions, shall be as mentioned hereunder:

Describe Background	Specific limitations and/or conditions for implementation (Article 25.1 and 25.2 Grant Agreement)	Specific limitations and/or conditions for Exploitation (Article 25.3 Grant Agreement)
Apama	Access Rights to Background are subject to a separate “Standard License Agreement” to specify the materials and products (software) and to stipulate the legal restrictions and limits (such as but not limited to export regulations, third party license restrictions, liability) pursuant to section 9.1 of this Consortium Agreement. Access rights not royalty free	limitations and conditions for implementations apply accordingly.
wM Integration Server	Access Rights to Background are subject to a separate “Standard License Agreement” to specify the materials and products (software) and to stipulate the legal restrictions and limits (such as but not limited to export regulations, third party license restrictions, liability) pursuant to section 9.1 of this Consortium Agreement. Access rights not royalty free	limitations and conditions for implementations apply accordingly.

Describe Background	Specific limitations and/or conditions for implementation (Article 25.1 and 25.2 Grant Agreement)	Specific limitations and/or conditions for Exploitation (Article 25.3 Grant Agreement)
ARIS	Access Rights to Background are subject to a separate “Standard License Agreement” to specify the materials and products (software) and to stipulate the legal restrictions and limits (such as but not limited to export regulations, third party license restrictions, liability) pursuant to section 9.1 of this Consortium Agreement. Access rights not royalty free	limitations and conditions for implementations apply accordingly.
BigMemory	Access Rights to Background are subject to a separate “Standard License Agreement” to specify the materials and products (software) and to stipulate the legal restrictions and limits (such as but not limited to export regulations, third party license restrictions, liability) pursuant to section 9.1 of this Consortium Agreement. Access rights not royalty free	limitations and conditions for implementations apply accordingly.
MashZone	Access Rights to Background are subject to a separate “Standard License Agreement” to specify the materials and products (software) and to stipulate the legal restrictions and limits (such as but not limited to export regulations, third party license restrictions, liability) pursuant to section 9.1 of this Consortium Agreement. Access rights not royalty free	limitations and conditions for implementations apply accordingly.

Describe Background	Specific limitations and/or conditions for implementation (Article 25.1 and 25.2 Grant Agreement)	Specific limitations and/or conditions for Exploitation (Article 25.3 Grant Agreement)
Terracotta	Access Rights to Background are subject to a separate “Standard License Agreement” to specify the materials and products (software) and to stipulate the legal restrictions and limits (such as but not limited to export regulations, third party license restrictions, liability) pursuant to section 9.1 of this Consortium Agreement. Access rights not royalty free	limitations and conditions for implementations apply accordingly.
Cumulocity	Access Rights to Background are subject to a separate “Standard License Agreement” to specify the materials and products (software) and to stipulate the legal restrictions and limits (such as but not limited to export regulations, third party license restrictions, liability) pursuant to section 9.1 of this Consortium Agreement. Access rights not royalty free	limitations and conditions for implementations apply accordingly.
Trendminer	Access Rights to Background are subject to a separate “Standard License Agreement” to specify the materials and products (software) and to stipulate the legal restrictions and limits (such as but not limited to export regulations, third party license restrictions, liability) pursuant to section 9.1 of this Consortium Agreement. Access rights not royalty free	limitations and conditions for implementations apply accordingly.

Describe Background	Specific limitations and/or conditions for implementation (Article 25.1 and 25.2 Grant Agreement)	Specific limitations and/or conditions for Exploitation (Article 25.3 Grant Agreement)
Build.IO	Access Rights to Background are subject to a separate “Standard License Agreement” to specify the materials and products (software) and to stipulate the legal restrictions and limits (such as but not limited to export regulations, third party license restrictions, liability) pursuant to section 9.1 of this Consortium Agreement. Access rights not royalty free	limitations and conditions for implementations apply accordingly.
Universal Messaging/Nirvana	Access Rights to Background are subject to a separate “Standard License Agreement” to specify the materials and products (software) and to stipulate the legal restrictions and limits (such as but not limited to export regulations, third party license restrictions, liability) pursuant to section 9.1 of this Consortium Agreement. Access rights not royalty free	limitations and conditions for implementations apply accordingly.
Zementis	Access Rights to Background are subject to a separate “Standard License Agreement” to specify the materials and products (software) and to stipulate the legal restrictions and limits (such as but not limited to export regulations, third party license restrictions, liability) pursuant to section 9.1 of this Consortium Agreement. Access rights not royalty free	limitations and conditions for implementations apply accordingly.

Software AG provided its background IP on a non-royalty free basis through technical access on Software AG systems which are specially set up for the period of this project. Any access was granted to Software AG 's sole discretion.

The Software may contain or include software applications for which Software AG itself had to acquire a license to use from a third party (“Third Party Applications”). These Third-Party Applications may be subject to additional license terms (“Third Party Terms”), which are available under the web address

<http://documentation.softwareag.com/legal/thirdparty.htm>

The third party shall be entitled (only in relation to the respective third-party software) to exercise the rights of Software AG under this Agreement as a third-party beneficiary directly against the Party. All Third-Party Applications shall be transferred and/or used on an 'AS IS' basis, subject only to any warranties and licenses provided by the manufacturer or supplier of the Third-Party Applications.

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5 Exploitation Plan

5.1 The direct Key Exploitable Results

The work of the Exploitation Board led to four direct Key Exploitable Results (KERs), which have been developed jointly by the consortium during the SENATOR Project. These KERs, which are summarised below, are focused on how what has been created could be used, create value and have commercial value (although there is also an emphasis on policy lessons which should be learnt from the project).

The key sources of innovation that are direct Key Exploitable Results are summarised in the following table.

Direct Result (KER)	Key Exploitable	Target stakeholders	Description of direct KER	Technology Level (TRL)
5.	Operational logistics planning tool	Logistics operators	As a prototype the SENATOR Platform allows logistics operators to plan daily deployment of vehicles and delivery staff based on optimised routings. Again, as a prototype, the SENATOR Platform also provides the technical capability for several different logistics operators to collaborate to make optimised deliveries.	7
6.	Strategic planning tool/transport model for urban logistics	Logistics operators & city authorities	As a prototype, the SENATOR Platform has the potential to allow logistics operators to test the impact of new operational strategies or regulatory regimes on their operations before implementation at street-level in a particular city. Similarly, it allows city authorities to test the impact of new regulatory regimes on city logistics operations before implementation at street-level in a particular city as part of the development of the cities' Strategic Urban Logistics Plans (SULPs).	5
7.	Route training tool for urban logistics	Logistics operators	The SENATOR Platform, with some further development, could also allow transport operators to train delivery staff on the optimal routes they should follow, both in advance of carrying out the deliveries at street-level, or on their delivery rounds, in a particular city ² .	5
8.	Key lessons on policy collaboration in logistics	Policymakers	The SENATOR project highlighted some key policy issues that emerged during the attempted implementation of collaborative logistics approaches in the Urban Living Labs,	-

² Although it should be noted that the Platform is designed to optimize delivery rounds depending on the distribution of deliveries on any given day and so the precise route will vary from day to day.

highlighting some key commercial and legal
barriers that technology cannot easily resolve.

KER1, particularly in relation to facilitating collaboration between logistics operators, was the key objective of the project, but KER2 and KER 3 have emerged as potential opportunities as a result of the work carried out during the Urban Living Labs in Zaragoza and Dublin respectively. Further details of each of these four KERs are provided below.

5.2 Operational logistics planning tool (KER1)

The work carried out in both the Zaragoza and Dublin ULLs demonstrated how the SENATOR Platform provides a prototype for an operational tool that could be used by logistics operators to optimise routes to minimise CO₂ emissions and/or costs on a daily basis. The platform could also be used to optimise routing for logistics operators when collaborating with each other, involving the transfer of parcels or other cargo between them.

The key technical issue that emerged was that the optimisation algorithm takes a lot of time when trying to optimize all the operators' networks at the same time for a day's operations at a city level, but when the optimization is applied to the zone of influence of one delivery unit the optimisation problem takes an hour or less to solve. It is believed, however, that, with further development, the optimisation algorithm could be made more efficient so that in the future it might be possible to use it as an operational planning tool at a city level.

The other technical barrier to implementation to allow collaborative working is likely to be the amount of time and effort required to ensure the integration of SENATOR with many other different IT systems, which have each been designed for only individual company operations. However, this barrier could be overcome if all the relevant parties were willing to engage in the process.

5.3 Strategic planning tool/transport model for urban logistics (KER2)

5.3.1 Strategic planning tool for urban logistics

The work carried out in both the Zaragoza and Dublin ULLs demonstrated how the SENATOR Platform could be used as a strategic planning tool by logistics operators to test the impact of new operational strategies or regulatory regimes on their operations before implementation at street-level in a particular city. This would allow the logistics operators to analyse the potential impact on their operations of significant interventions by the public

sector, such as the introduction of pedestrianised (vehicle-free) zones or a zero emissions zone, so that lessons can be learned and any unintended consequences can be raised with the city authorities before their implementation. The SENATOR Platform could also be used to test the impact of operational changes, such as the impact on costs and emissions of a potential change in the location of a delivery depot or of the introduction of a new fleet of electric vehicles.

The SENATOR Platform allows logistics infrastructure (e.g., depots, consolidation centres) to be added along with demand for urban logistics services (consignments to be delivered to or collected from particular locations within the city) and supply of urban logistics services (fleets of vehicles based at each depot and for each delivery company). This allows an optimised baseline of delivery routes to be modelled, which would seek to minimise the operator's costs and those of the delivery vehicles.

As the SENATOR Platform provides outputs in terms of operators' costs, carbon emissions and vehicle kilometres and time spent, it facilitates the appraisal of the quantified costs and benefits of the scenario compared to the status quo for the transport operator. The SENATOR Platform would therefore allow the logistics operators to test the impact of potential interventions or operational measures in a quantified way before making major operational decisions. It would also provide the logistics operators with quantified evidence to present to city authorities during stakeholder consultation on their Sustainable Urban Logistics Plans (SULPs).

5.3.2 Urban freight transport model

The work carried out, in particular in the Dublin ULL, demonstrated how the optimization module within the SENATOR Platform could also be used as an urban freight transport model to simulate the impact of interventions by the public sector in the urban freight transport market. This allows significant interventions, such as the introduction of pedestrianised (vehicle-free) zones or a zero emissions zone, to be tested in a digital environment so that lessons can be learned, and any unintended consequences avoided before their implementation.

5.4 Route training tool for urban logistics (KER3)

The work carried out in the Zaragoza ULL demonstrated how the SENATOR platform could be used as a route training tool for new delivery staff when they do not know the geography of their route. This would help to speed up the process of learning a new route which can lead to faster use of an efficient route and minimise emissions and operator costs.

To this end, the SENATOR Platform could be used in this context in two ways:

- Depot-based training: The member of delivery staff has access to the SENATOR Platform and is allowed to input the demand for their delivery route and then the SENATOR Platform is used to propose an optimised delivery route, which the member of delivery staff can then visualise and follow on the GIS map of the relevant city.
- Street level training: The member of delivery staff has access to the SENATOR App via a smartphone and is able to follow at street level the optimised route suggested by the SENATOR Platform. This would allow the delivery staff member to learn a new route, while also following the proposed route which minimises emissions and operator costs until the route is learned. The ability of the SENATOR Platform to train delivery staff to deliver parcels and letters on a fixed route would, however, be affected by the Platform's functionality; as the Platform seeks to optimise deliveries each day depending on the geographic distribution of demand on that day (which can vary significantly) the proposed route would also vary.

5.5 Key policy lessons on collaboration (KER4)

The work carried out in the Urban Living Labs in Zaragoza and Dublin highlighted there were some key policy lessons to be learned from the attempt to use the SENATOR Platform as a means to facilitate collaboration between operators to increase vehicle capacity utilisation and reduce impacts such as environmental emissions.

While the SENATOR Platform is designed for collaborative working and to allow for the switching of cargo between different logistics providers and cater for the concept of consolidation, there were barriers to this occurring in practice that could not easily be resolved directly through use of the technology in the SENATOR Platform. These barriers were as follows:

- Reluctance on the part of logistics providers to share information with competitors for commercial reasons;
- Concerns from logistics providers about the security of their parcel deliveries and the liability for damaged or lost parcels when working collaboratively and therefore handing parcels over to other logistics providers for last mile deliveries;
- Concerns from logistics providers about breaching competition law; and
- Data privacy issues related to delivery operatives and delivery addresses.

These policy-related issues will be considered in more detail in the Final Report for the project.

6 IPR & knowledge strategy after project completion

6.1 Introduction

This section of the deliverable sets out what has been created and then describes the extent to which the partners intend to protect the IP they have developed after the end of the project.

The information for this section of the deliverable was collected directly from the project partners by means of a survey in February 2025. It therefore reflects the views and intentions of partners close to the end of the project.

6.2 What has been created

The main innovation/invention of the SENATOR project has been the SENATOR Platform, which is made of several parts:

- Back end to SENATOR Platform: allows data to be input into the software platform and problems to be posed;
- Algorithm for SENATOR Platform: allows the platform to solve optimisation problems;
- Messaging bus for SENATOR Platform: allows the software platform to communicate with (receive input data from and send outputs to) a range of stakeholders; and
- Dashboard for SENATOR Platform: visualises outputs (the results from the software platform) both geographically and in terms of Key Performance Indicators (KPIs).

Partners have also highlighted the creation of a number of additional outputs from the project such as:

- Scientific papers for publication;
- Methodologies for the analysis of project impacts (social, economic, commercial);
- Stakeholder involvement in the project (citizens, businesses, municipalities, politicians);
- The SENATOR Business Plan; and
- Urban planning and urban logistics policy development.

6.3 Conclusion

Several of the partners believe they have made some direct contribution to the development of the main invention of the project (the SENATOR Platform) through the provision of data, cost models, facilitating testing in the Urban Living Labs. They therefore believe they might be able to claim a proportion of the ownership of the SENATOR platform. However, none of these partners intend to pursue any potential IP rights in any practical way.

The main elements of the SENATOR Platform are, in any case, only available in any practical sense to the three partners who were mainly responsible for their development during the project and other partners do not have a copy of them. The relevant partners are as follows:

- DEUSTO: back-end to, and algorithm for, the SENATOR Platform;
- Software AG: messaging bus for the SENATOR Platform; and
- DotGIS: dashboard for the SENATOR Platform.

None of the partners are intending to take action to formally protect their IP, even though most partners are interested in exploiting (including commercially) the results of the project – both their own results and, in some cases, the SENATOR Platform itself. It is possible this will result in discussions between some partners about exploiting the SENATOR Platform after the project has ended.