Multi Party Agreement

Deployment of the SRTI Ecosystem: Data for Road Safety

Increasing road safety by sharing road safety related data and information between public and private entities.

Parties to this Multi Party Agreement are:

1. **The State of the Netherlands (Ministry of Infrastructure and Water Management)**
   located at Rijnstraat 8, 2515XP The Hague, the Netherlands
   ,

2. **Spain (Ministry of Home Affairs, Dirección General de Tráfico - DGT)**
   located at Calle Josefa Valcarcel 44, 28071 Madrid, Spain
   ,

3. **Finland (Traffic Management Finland Ltd & Intelligent Traffic Management Finland Ltd)**
   located at Palkkatilanportti 1, 00240 Helsinki, Finland
   ,

4. **Germany (Federal Ministry of Transport and Digital Infrastructure)**
   located at Invalidenstrasse 44, 10115 Berlin, Germany
   ,

5. **Grand-Duché du Luxembourg (Ministère de l'Économie)**
   located at Boulevard Royal 19-21, L-2449 Luxembourg, Luxembourg
   ,

6. **Mercedes Benz Connectivity Services GmbH**
   located at Siemensstraße 7, 70469 Stuttgart, Germany
   ,

7. **Bayerische Motoren Werke AG ("BMW AG")**
   located at Petuelring 130, 80788 Munich, Germany
   ,

8. **Ford Smart Mobility U.K.**
   located at Business Unit 2, Broadcast Centre, Here East, Queen Elizabeth Olympic Park, Stratford, E20 3BS, London, England
   ,

9. **TomTom Traffic B.V.**
   located at Oosterdoksstraat 114, 1011 DK Amsterdam, The Netherlands
   ,

10. **HERE Europe B.V.**
    located at Kennedyplein 222, 5611 ZT Eindhoven, The Netherlands
    ,

11. **AUDI AG**
    located at Auto-Union-Straße 1, 85057 Ingolstadt, Germany
    ,

12. **Volvo Car Corporation**
    located at 405 31 Göteborg, Sweden
    ,

13. **Agentschap Wegen en Verkeer (Belgium)**
    located at Koning Albert II-Laan 20 bus 4 - 1000 Brussels, Belgium
    ,

14. **AUTOBAHNEN- UND SCHNELLSTRASSEN-FINANZIERUNGS-AKTIENGESELLSCHAFT (ASFINAG)**
    located at in Rotenturmstrasse 5-9, Wien 1011, Austria
    ,

15. **Niradynamics AB**
    located at Wallenbergs gata 4, 58330 Linköping, Sweden
    and

16. Highways England
    located at 1 Walnut Tree Close, GU1 4LZ Surrey, England

Hereinafter are Parties 1, 2, 3, 4, 5, 13, 14 and 16 also referred to as State.
This Agreement will be open to the accession of new parties.

The Parties hereby agree as follows:

Article 1 Definitions

Aggregator	A Party that uses Data (L2) to create Data (L2´) e.g. by harmonizing and cleansing Data (L2) from Data Sources;
Agreement	This Multi-Party Agreement;
Chair	A legal entity affiliated with the SRTI Ecosystem;
Content	Data (L2), Data (L2') and/or Data (L3);
Creator	A Party that uses Data (L2), Data (L2´) and/or Data (L3) fully or partly received through the SRTI Ecosystem to create Data (L3);
Data (L2)	The raw data made available to the SRTI Ecosystem that can be used for creating road safety related minimum universal traffic information. This data is collected via any private and/or public source, also referred to as 'road safety related traffic data (as defined in article 2-m of Regulation 886), also referred to as "Level 2 Data";
Data (L2')	Data (L2') is an enriched version of Data (L2) made available to the SRTI Ecosystem and created by cross referencing the Data (L2) across multiple L2 data sources and/or through data harmonization and cleansing of the Data (L2), also referred to as "Level 2 Prime Data;
Data (L3)	Any extracted, aggregated and processed road safety related traffic information made available to the SRTI Ecosystem, offered by public and/or private road operators and/or service providers to End Users through any delivery channels, also referred to as "L3 Information"" or "Road Safety Related Minimum Universal Traffic Information" or "SRTI" (as defined in article 2-n of Regulation 886;
Data Access Interface Provider	An entity that provides access to Content;
Data Source	A Party that generates Data (L2), Data (L2') and/or Data (L3);
End User	Any driver within a State benefiting from Data (L3) (as defined in article 2-k of Regulation 886);
Entrant	A legal entity that expresses the ambition and is willing to become a party of this Agreement after the date it comes into effect;

E-privacy directive	Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector;
EU ITS	Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems (ITS) in the field of road transport and for interfaces with other modes of transport;
Free of Charge	No extra fee or other financial payment by the End User for the reception and use of Data (L3) at the point of use (as defined in article 2-p of Regulation 886);
GDPR	Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation);
NAP	National Access Point (NAP) as described in article 7 of Regulation 886 and respectively in Article 3 of the Delegated Regulations (EU) 2015/962 and (EU) 2017/1926;
Open Data Directive	Directive 2003/98/EC of the European Parliament and the Council of 17 November 2003 on the re-use of public sector information, as amended by Directive 2013/37/EU of 26 June 2013 and its successor Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information;
Public Authority	Any Public Authority that is located within a State whom's authority is not vested in a State;
Regulation 886	Commission Delegated Regulation (EU) No 886/2013 of 15 May 2013 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to data and procedures for the provision, where possible, of road safety-related minimum universal traffic information free of charge to users;
Service Provider	A Party that renders and distributes Data (L3) acquired through the SRTI Ecosystem directly to an End User;

SRTI Ecosystem	The exchange of Content between Parties to this Agreement under the terms and conditions of this Agreement and thus creating a trust domain for that exchange;
State	Any of the participating EU Member States, United Kingdom, Norway and Switzerland, including organisations working on behalf of the State or commissioned by the State.

Preamble:

Whereas:

(a)   During the High Level Meeting on Connected and Automated Driving on the 15th of February 2017 in Amsterdam, the participating Member States and the industry started a dedicated public-private task force (the "Data Task Force") to set initial steps for deployment of data-sharing for traffic safety related data in real life situations (local hazard warnings, incident management, infrastructure maintenance and traffic management) for public and private parties and to ultimately increase road safety for End Users.

(b)   The group decided its initial scope to be Safety Related Traffic Information (SRTI) because of the high societal value, technological readiness and commitment from the stakeholders. To do so, the Data Task Force established a SRTI ecosystem, which can be seen as a practical implementation of the Regulation 886.

(c)   The founding parties of this SRTI ecosystem are: Bayerische Motoren Werken AG (BMW AG), FORD Smart Mobility U.K, Mercedes-Benz Connectivity Service GmbH, Volvo Cars, HERE Europe B.V, TomTom Traffic B.V, Federal Ministry of Transport and Digital Infrastructure of the Federal Republic of Germany, Spain, Finland, Grand-Duché du Luxembourg (Ministère de l'Économie) and the State of the Netherlands.

(d)   The parties of the Data Task Force signed a Memorandum of Understanding 1 and entered a proof of concept phase which started at the ITS Europe Congress in Eindhoven on the 3rd of June 2019 and lasted for sixteen months. Parties do now wish to extend their cooperation by signing this Agreement, which can be seen as a structural continuation and further improvement of the proof of concept phase.

(e)   Parties recognize that there are numerous different interpretations regarding Regulation 886. This Agreement is the result of extensive debate between Member States, European Commission and the industry, which has ultimately led to this Agreement. In no way does this Agreement affect the rights and obligations under existing legislation such as the Regulation 886.

(f)   By signing this Agreement Parties become part of the SRTI Ecosystem. Every Party fulfils one or several roles in the SRTI Ecosystem. Parties are aware that the SRTI Ecosystem is only as good as the sum of its parts. However, there will be a difference on how the Parties contribute to this SRTI Ecosystem as they have different levels of capabilities in this field. Parties are committed to support the SRTI Ecosystem to the best of their abilities to improve road safety for all road users.

(g)   The Agreement stimulates a decentralized approach where Parties are all granted access to the relevant Content within the SRTI Ecosystem on a non-discriminatory basis. Hence, Content will be exchanged by Parties directly instead of being channelled via a centralised node or party. The decentralized approach does not operate exclusively via the NAP but does safeguard that the NAPs are in the loop.

(h)   The SRTI Ecosystem strives to be as open an ecosystem as possible to effectively implement Regulation 886 and reach a maximum amount of End Users within its entire geographic scope, while still safeguarding the rights of the Parties of this Agreement.

(i)   Parties recognize that ideally they would make use of an existing and widely recognised license option such as an open license. However, the debate surrounding intellectual property rights on data, information and services does not provide a common understanding at this point in time nor does there exist a common agreed taxonomy on terms like non-commercial use. Parties are closely monitoring these discussions and are committed to work on a possible change from this Agreement into a license model in a near future.

(j)   Although the European Commission and associations as the European Automobile Manufacturers' Association (ACEA) cannot enter this Agreement as a Party, they can be assigned by Parties as Chair of the General Assembly, since they are affiliated with the SRTI Ecosystem.

(k)   Parties recognize there is no consensus whether there are intellectual property rights vested on the Content or not. Parties grant a license to use the Content subject to the conditions described in this Agreement, regardless of whether the Content is protected by intellectual property rights or not.

(l)   This Agreement contains the conditions under which the provision and use of Content takes place. Parties express the intent to scale up the exchange of Content for the purpose of improving road safety. This includes enabling other industry partners and Member States to enter this Agreement (and thereby contributing to the SRTI Ecosystem).

(m)   The multi-party SRTI Ecosystem strives to be as open as possible by expressly supporting the unbureaucratic addition of new Parties willing to contribute to the improvement of road safety. The use of digital governance solutions (eGovernance) enables to streamline the accession process, while also providing a central record of documents, votes and resolutions needed to safeguard the scaling, continuity and transparency of the ecosystem.

Article 2 Purpose

1. The purpose of this Agreement is to improve road safety by exchanging road safety related data and information within the SRTI Ecosystem in order to provide Data (L3) Free of Charge to End Users as required by Regulation 886.

2. This Agreement contains the terms and conditions of how Content will be exchanged and used on the basis of reciprocity to create information services on road safety related events and conditions as defined in Regulation 886 within the participating States.

Article 3 Reciprocity and compensation

1. Content is exchanged within the SRTI Ecosystem in-kind on the basis of reciprocity for the sole purpose of road safety.

2. Reciprocity is understood within the context of this Agreement as the obligation of each contracting Party to contribute to the SRTI Ecosystem by sharing Data (L2), Data (L2') and/or Data (L3), depending on its role within the SRTI Ecosystem and corresponding obligations stated in article 4. The Data Source will exercise reasonable discretion for the Content it shares. That reasonable discretion will be scrutinized by the General Assembly. In turn, each Party is entitled to use the Content of other Parties under the conditions described in this Agreement.

3. In-kind means within the context of this Agreement that the exchange of Content is without any financial compensation between Parties of this Agreement. Instead, it is on the basis of reciprocity as mentioned in article 3.2. Therefore, Parties do not owe any financial compensation to each other for the exchange and use of the Content.

Article 4 Roles within the Ecosystem

1. Each Party shall fulfil at least one of the following roles within the SRTI Ecosystem:

    a.   Data Source;

    b.   Aggregator;

    c.   NAP;

    d.   Creator;

    e.   Service Provider.

2. A Data Access Interface Provider is an entity that provides access to Content. A Data Access Interface Provider is no Party to this Agreement and thus has no voting rights in the General Assembly unless it performs additionally one of the roles mentioned in Article 4.1 as a Party.

3. Each Party may choose and shall declare (see form in Annex 2 [201005-IntakeFormSRTIEcosystem]) to the SRTI Ecosystem in writing the role(s) as laid out in Article 4 (1) it is willing to and intends to take initially. Each Party may change its role(s) at any time. Any changes to the selected role(s) shall be communicated in advance to the then current chair of the General Assembly of the SRTI Ecosystem in writing.

4. A Data Source is obligated to share or provide access to its generated Data (L2), Data (L2') and/or Data (L3) to all requesting Parties. The Data Source will exercise reasonable discretion for the Content it shares. That reasonable discretion will be scrutinized by the General Assembly.

5. An Aggregator is obligated to provide Data (L2') that is created on the basis of Data (L2) that is acquired through the SRTI Ecosystem to all requesting Parties.

6. A NAP functions according to the specifications under Regulation 886.

7. A Creator is obligated to provide Data (L3) that is created on the basis of Data (L2), Data (L2') and/or Data (L3) that is acquired through the SRTI Ecosystem to all requesting Parties.

8. A Service Provider is obligated to provide Data (L3) that is acquired through the SRTI Ecosystem Free of Charge to the End User.

Article 5 Provision of Content

1. The Parties providing Content grant each other a limited, non-exclusive, revocable license to use the Content solely within the geographic area of the European Union and the States as defined in this Agreement and under the terms and conditions as described in this Agreement.

2. Content is provided strictly on an "as is", "where is" and "as available" basis and the Party providing the Content gives no assurance or warranty that the Content is accurate, complete, up-to-date, available, error-free, and fit for purpose. However, Parties intend to undertake all reasonable efforts with respect to enhancing the availability, quantity and quality of the provided Content continuously.

3. Subject to the provisions of paragraph 1 and 2, the Data (L2) and the Data (L2') need to be provided to any requesting Party in accordance with the technical description in Annex I [Data For Road Safety Technical Documentation Version 1.01]. Data (L2) and Data (L2') need to include at least the following components:

   a.   A unique ID for every observed/detected event

   b.   Event type;

   c.   Heading of travel;

   d.   Longitude;

   e.   Latitude;

   f.   Time stamp.

4. Subject to the provisions of paragraph 1 and 2, the Data (L3) needs to be provided in accordance with the protocol as defined in article 7 of Regulation 886 and needs to include at least the components as defined in article 4 of Regulation 886.

Article 6 Use of Content

1. The Content received through the SRTI Ecosystem shall be used for the sole purpose of enabling the provision of Data (L3) Free of Charge to the End User and thereby improving road safety. More specifically, only the following usage is allowed:

   a.   For creating Data (L2') and Data (L3);

   b.   For providing Data (L3), and

   c.   For improving the creation of Data (L3).

2. The Content received through the SRTI Ecosystem may not result in a commercial advantage for any Party.

3. The Content received from the SRTI Ecosystem shall be deleted without undue delay after the aforementioned purposes are fulfilled, at the latest after a period of two months after receiving the Content.

4. The Data (L3) received through the SRTI Ecosystem must be handled by Parties in accordance with Regulation 886. This means, amongst other things, that Data (L3) made available to an End User must be Free of Charge.

5. The End User shall always receive the Data (L3) Free of Charge. This means in this context that:

    a. Parties may not charge End Users to receive Data (L3) in traffic related applications and services i.e. an additional fee via an in-app upgrade and/or in-app purchase;

    b. If fee-based (i.e. commercial) and non-fee based (i.e. non-commercial) applications & services are provided, the Data (L3) must be included in both types of applications and services;

    c. The provision of Data (L3) to the End User will not lead to an additional fee except the charges explicitly permitted by the Regulation 886.

6. Parties are not allowed to share Content acquired through the SRTI Ecosystem with a third party outside of the SRTI Ecosystem, except providing Data (L3) to End Users and the exceptions laid out in Article 7.2, 7.4 and 7.5.

7. Parties may not reverse engineer algorithms, software code or other technologies used by Data Source(s), Creator(s) or Aggregator(s) in connection with Data collection, processing, aggregation or otherwise in their products. In case any such technical or commercial information becomes available to a Party, the Party undertakes to treat this information as confidential business secret of the Data Source(s), Creator(s) or Aggregator(s) (respectively) which is not intended to be used by the Party or anyone else.

8. For any use of the Content beyond the scope and conditions laid out in this Agreement, including a commercial use, the application of an alternative license is expressly allowed outside of the SRTI Ecosystem or outside of the scope of this Agreement. Different terms and conditions can thereby be set by the respective Parties involved – and in particular the Data Sources and intellectual property right owner(s).

Article 7 Use of Content by the State and/or Public Authority

1. In addition to the provisions of Article 6, States and/or Public Authorities are allowed the following usage in order to fulfil obligations under the Open Data Directive, public tasks and other applicable laws and regulations.

2. Each State and/or Public Authority is allowed the following usage with regard to Data (L3) received through the SRTI Ecosystem:

   a. Disseminate this Data (L3) to End Users (e.g. broadcasting);

   b. Make metadata affiliated to this Data (L3) accessible via their NAP or other suitable repository;

   c. Act upon the Data (L3) to conduct its public tasks to enhance or safeguard road safety;

   d. Any other usage that is required to fulfil applicable laws, regulations and public tasks following from law or regulation.

3. Any use of Data (L3) received through the SRTI Ecosystem other than that specifically permitted by Article 7.2 is forbidden.

4. Each State is allowed to provide Content received through the SRTI Ecosystem to local authorities and local private and public road operators for the purposes stated in article 7.2, and to private radio broadcasters for the purpose stated in article 7.2.a.

5. Each State and/or Public Authority can, as required under the Open Data Directive, allow the re-use by a third party of Data (L3) that has been created by the State (or a subcontractor commissioned by the State) on the basis of the Content received through the SRTI Ecosystem. The use of this Data (L3) by the State and third parties is not monitored or limited.

Article 8 Intellectual property rights

1. With this Agreement, Parties do not transfer any intellectual property rights to each other. Parties grant a license to use the Content subject to the conditions described in article 6 and 7.

2. Parties will comply with the conditions described in this Agreement, regardless of whether the Content is protected by intellectual property rights or not.

3. Parties expressly recognize that this Agreement is not intended to impair the value or validity of Parties' respective intellectual property of any kind, nor does the Agreement grant (or be construed as granting) any other rights (such as (but not limited to) implied license, granting rights for wider geographical scope, or exhaustion of Parties' intellectual property rights) than the ones expressly granted in this Agreement.

Article 9 Compliance

1. Parties will act in compliance with Regulation 886 and the (national) implementation of EU ITS.

2. This Agreement, in no way, affects the obligations of the Parties under Regulation 886.

3. Parties shall take appropriate measures to ensure that the delivery of the Content does not violate the rights of third parties with regard to intellectual property and other forms of control.

4. Parties shall take appropriate measures to ensure that any Content processed within the SRTI ecosystem does not contain personal data as defined in Article 4 (1) GDPR.

5. Parties providing Content shall take appropriate measures to ensure that the Content does not contain identifiers that directly or indirectly relate to an identified natural person.

6. The Parties are not obliged to share data unless there is a legal obligation such as Regulation 886.

7. The Parties aggregating, enriching, cleansing or distributing Content shall take appropriate measures to avoid that through that processing (e.g. combination of data sources) the Content becomes personal data.

8. If one of the Parties suspects that the Content that has been or is being provided on the basis of the Agreement notwithstanding article 9.5 contains or has become personal data this Party will immediately inform the General Assembly in writing. If it is established or there is a well-founded suspicion that the Content contains or has become personal data, the Parties involved will immediately:

    a. take all reasonable measures to comply with the GDPR, the E-Privacy directive or its successors and its (national) implementation, including – if necessary – erase or anonymize the personal data;

    b. take all reasonable measures to limit the impact of a violation of the GDPR, the E-Privacy directive and its (national) implementation.

9. Without prejudice to the provisions of articles 9.5, 9.6 and/or 9.7, if from a change in legislation, a decision of the European Court of Justice or the European Court of Human Rights, a (solicited or unsolicited) advice, decision or opinion of a national supervisory authority or guidelines from the European Data Protection Board follows that the Content provided on the basis of the Agreement should (possibly) qualify as personal data, an extraordinary General Assembly will be called upon by the current Chair as soon as reasonably possible. During this extraordinary General Assembly the Parties will discuss the impact of such decision, opinion or guidelines on the SRTI Ecosystem and decide on the measures to be taken to act in accordance with article 9.4. In the situation described in articles 9.8 and 9.9 any Party has the right to (temporarily) end the provision of Content.

10. The Parties are not obliged to comply with any provision of this Agreement if such a provision directly or indirectly requires the provision of Content that (possibly) contains personal data. Any such provision of this Agreement is considered to be invalid.

Article 10 Disclaimer of Warranties and Limitation of Liability

1. Notwithstanding the terms and conditions of this Agreement, to the extent possible, Parties provide the Content as-is and as available, and make no representations or warranties of any kind concerning the Content, whether express, implied, statutory, or other. This includes, without limitation, warranties of title, merchantability, fitness for a particular purpose, noninfringement, absence of latent or other defects, accuracy, or the presence or absence of errors, whether or not known or discoverable. Where disclaimers of warranties are not allowed under the applicable law in full or in part, this limitation may not apply.

2. To the extent possible, in no event will a Party be liable to any other Party on any legal basis (including, without limitation, negligence) or otherwise for any direct, special, indirect, incidental, consequential, punitive, exemplary, or other losses, costs, expenses, or damages arising out of this Agreement or use of the Content even if that Party has been advised of the possibility of such losses, costs, expenses, or damages. Where a limitation of liability is not allowed under the applicable law in full or in part, this limitation may not apply.

3. Notwithstanding the limitations stated in provisions 1 and 2, there shall be no limit on liability for the following: (a) losses arising out of an at least negligent breach of one or more of the provisions described under Article 9 "Compliance" ; (b) losses arising out of the willful misconduct or gross negligence of any Party and/or (c) losses arising out of an at least negligent breach of usage restrictions described under Article 6 or 7.

Article 11 Assignment

Parties may use subcontractor(s) in the execution of this Agreement, provided that the Party shall remain fully responsible for the acts and omissions of such subcontractor(s) under this Agreement. In such a situation the limitations of liability described in Article 10 also apply.

Article 12 Governance SRTI Ecosystem

1. The decision-making body within this Agreement is the General Assembly. Every Party has one seat in the General Assembly.

2. In the General Assembly, all contracting Parties have one vote each.

3. The General Assembly has the following tasks:
   a. enable discussion between Parties with regard to the functioning of the SRTI Ecosystem;
   b. take decisions, only on items stated in article 12, paragraph 4.

4. The General Assembly can only decide on:
   a. items with regard to the interpretation of this Agreement;
   b. the dismissal of a Party under the terms of article 14, and
   c. topics and activities that, directly or indirectly, facilitate the fulfilment of this Agreement and/or the SRTI Ecosystem as a whole.

5. The regular meeting cadence for the General Assembly is once within 12 months. Each General Assembly will assign a Chair and a date for the next regular General Assembly. The assigned Chair takes the responsibility to:

   a. Act as a central point of contact for the duration of the period up to the next General Assembly;

   b. Collect the agenda items from Parties, highlighting whether these items are to be discussed or require a decision of the General Assembly;

   c. Send out invites, including the agenda, two weeks ahead of the scheduled date for the General Assembly;

   d. Run the Chair during the General Assembly;

   e. Take meeting minutes, documenting in writing any decisions that have been made;

   f. Share the meeting minutes with all Parties;

   g. Fulfil administrative tasks with regards to the e-governance tool laid out in article 19.

6. The General Assembly can only decide on items that had been mentioned as 'decision items' in the agenda that had been sent with the invite within the limits stated in article 12 paragraph 4.

7. Any Party may call for an extraordinary General Assembly to take place to make a decision that impacts or may impact the SRTI Ecosystem ("Extraordinary General Assembly"). Unless otherwise agreed, Extraordinary General Assemblies shall be conducted by means of a videoconference.

8. Calls for an Extraordinary General Assembly shall be made by a Party by email to the incumbent Chair of the General Assembly, indicating the reason for the Extraordinary General Assembly and proposing a date and time for such Extraordinary General Assembly.

9. In case more than half of the existing Parties and at least 51% of the States participate in the regular or Extraordinary General Assembly, the regular or Extraordinary General Assembly shall constitute a quorum.

10. Parties that don't attend the regular or Extraordinary General Assembly can authorize any participating Party to vote on their behalf. Authorizations have to be proven by a written power of attorney. All such authorizations have to be submitted to the Chair of the regular or Extraordinary General Assembly by the beginning of such General Assembly at the latest.

11. The Party calling an Extraordinary General Assembly shall be obliged to arrange an appropriate video-conferencing facility to be used, shall function as the Chair of the Extraordinary General Assembly, shall document the Parties present, take minutes of the

Extraordinary General Assembly, count the casted votes, and shall take care of other administrative matters as applicable.

12. Decisions shall be made by a simple majority vote by the Parties present in the General Assembly or Extraordinary General Assembly at the time of the vote.

13. Decisions within the General Assembly or Extraordinary General Assembly shall concern roles, as specified in article 4, and not specific Parties, except for decisions regarding article 14.

14. By way of derogation from paragraph 12, a decision item is rejected if:
    a. All attending States vote against a decision item of the General Assembly or Extraordinary General Assembly, or:
    b. All attending Parties, other than States, vote against a decision item of the General Assembly or Extraordinary General Assembly.
    c. With respect to the roles defined under Art. 4.1., all Parties fulfilling the same role vote against a decision item of the General Assembly or Extraordinary General Assembly.

Article 13 Accession

1. This Agreement will be open to the accession of new parties provided that this new party is able to fulfil at least one of the roles described in article 4.1.

2. Parties intend to promote this Agreement and the SRTI Ecosystem in order to expand this Agreement and the SRTI Ecosystem with third parties.

3. By signing this Agreement, all Parties authorize the incumbent Chair of the General Assembly to agree, on behalf of them, with the accession of an Entrant to this Agreement provided that this Entrant meets the following conditions:

    a. the Entrant formally declares it is willing and in a position to comply with all rights and obligations arising from this Agreement;

    b. the Entrant can provide evidence that it can contribute to the purpose of this Agreement as laid out in article 2 by fulfilling at least one of the roles (as laid out in article 4) within the SRTI Ecosystem ;

    c. the Entrant declares which of the roles (see article 4) it intends to play within the SRTI Ecosystem and, thereby, what it is intending to contribute;

d. the Entrant provides the information of Article 13.3 a, b and c in the self-declaration form (see Annex 2 [201005-IntakeFormSRTIEcosystem]) and distributes this to the Chair of the General Assembly.

4. The Chair of the General Assembly shall agree with the accession of an Entrant, provided that the conditions in article 13.3 are met, and shall inform each Party of the accession of a new Party.

5. The Accession of new Partners will be legally enacted only by a joint (digital) signature, as stated in article 19, of the following documents by the Legal Representatives respectively for A) the Chair of the GA at the time of signing, and B) the joining Party:

   a. The Multi-Party Agreement signature page;

   b. The self-declaration form.

Article 14 Dismissal

1. A Party to the SRTI Ecosystem can be dismissed by a termination of this Agreement with a Party under the conditions laid out below. Such a termination is decided on by the General Assembly and enforced by the Chair of the General Assembly, executing the decision of the General Assembly on behalf of all Parties, provided that at least one of the following criteria is fulfilled:
   a. a Party repeatedly and/or severely breaches its obligations under this Agreement, or
   b. a Party did not perform as stated in the self-declaration form.

2. Termination by dismissal as mentioned in article 14.1 is only allowed if the default has continued for thirty (30) days after written notice thereof was provided to the breaching party by the Chair of the General Assembly.

3. The termination shall be made in writing by the Chair of the General Assembly and all the rights and obligations of such terminated Party under this Agreement shall cease as of such termination.

4. The Chair of the General Assembly will inform each Party of the dismissal.

5. Upon termination all remaining Parties are obliged to take all measures necessary to end the flow of Content to and from the dismissed Party, thereby ensuring that the dismissed Party can no longer execute the role(s) laid out in article 4.

Article 15 Duration of the Agreement and termination

1. This Agreement enters into force on the November 1 2020 and will remain in force until October 31 2025. Following the expiration of its initial term, the Agreement shall continue in force and effect from year to year with those Parties that specifically approve such continuance at least annually.

2. Each Party is permitted to terminate its own participation to this Agreement at any time, after informing the Chair of the General Assembly, with or without cause, effective immediately, and shall thereby withdraw from the SRTI Ecosystem. For the avoidance of doubt, this Agreement shall continue to apply to the other Parties.

3. All provisions of this Agreement which by their nature should survive termination shall survive termination, including, without limitation, the restrictions described in article 6 and 7 and the limitations of liability.

4. After terminating its own participation to this Agreement, that Party shall without undue delay delete from any system in the control of the Party the Content that has been collected through the SRTI Ecosystem and relevant access information including corresponding documentation. The remaining Parties shall without undue delay delete from any system in the control of the Party the Content provided by the Party that has withdrawn from the SRTI Ecosystem. This article 15.4 shall also apply to each Party that is no longer a Party to this Agreement for other reasons, in particular termination of this Agreement as a whole or dismissal.

Article 16 Entire Agreement

1. This Agreement sets forth the entire understanding and agreement between the Parties as to the subject matter hereof and supersedes all previous communications and understandings, whether oral or written, between the Parties, with regard to the subject matter hereof.

2. No variation of this Agreement shall be binding upon any Party unless made in writing and signed by an authorized representative of each Party.

3. The applicability of any general terms and conditions which may be used by a Party or to which a Party may refer in any manner whatsoever is hereby specifically rejected by the Parties.

Article 17 Severability

If any provision of this Agreement is determined to be invalid or unenforceable by any court of competent jurisdiction, such finding shall not invalidate the remainder of this Agreement which shall remain in full force and effect as if the provision(s) determined to be invalid or unenforceable had not been a part of this Agreement. In the event of such finding of invalidity or unenforceability, the Parties will endeavour to substitute forthwith the invalid or unenforceable provision(s) by such effective provision(s) as will most closely correspond with the original intention of the provision(s) so voided.

Article 18 Dispute resolution and applicable law

1. This Agreement shall be governed by and interpreted in accordance with German law excluding its international private law rules and the Vienna Sales Convention.

2. Parties agree to endeavour to settle disputes on an amicable basis. In the event that disputes cannot be settled on such a basis, disputes shall be referred to the court of first instance in Berlin, Germany.

3. In derogation with article 18.1 and 18.2, all disputes that involve a State, arising out of or relating to this Agreement, or any agreements to be entered into by a State pursuant to this Agreement, that cannot be solved within the SRTI Ecosystem and its governance, shall be submitted to a competent court in the jurisdiction of that State nearest to where the government of that State has its seat and will be governed by and construed in accordance with the laws of that State excluding its international private law rules and the Vienna Sales Convention.

4. This Agreement does not create any legally enforceable rights or obligations between the States that are a Party to this Agreement. This Agreement does not constitute a treaty for States that are a Party to this Agreement.

5. This Agreement may be executed in any number of counterparts, each of which when executed and delivered digitally shall constitute a duplicate original, but all counterparts together shall constitute a single Agreement.

Article 19 E-governance

1. The regular and extraordinary General Assemblies will be supported by a digital interface that as a minimum set of functionalities allows to:
    a. prepare for the meetings, and

b. give access to the relevant information;

c. validate the Agenda and associated items;

d. raise potential issues;

e. automatically invite the Parties' representatives;

f. collect, record and monitor votes on resolutions / decisions in real-time; and

g. sign off the meeting minutes.

2. Signatures shall be given as follows;
   a. "Qualified Electronic Signature" (QES) for the legally binding digital signature of the Multi-Party Agreement upon accession of a (new) Partner,
   b. "Advanced Electronic Signature" (AdES) for the digital voting in the GA by the Delegates - or possible Proxies.

3. The appointed chair will cover E-governance's yearly fee.

Signature field

On behalf of

Organization   Ministry of Infrastructure and water management

Job Title   Minister of infrastructure and water management

Name and Surname   Cora van Nieuwenhuizen

Location, day month year   Den Haag, 29-10-2020

Signature field (optional)
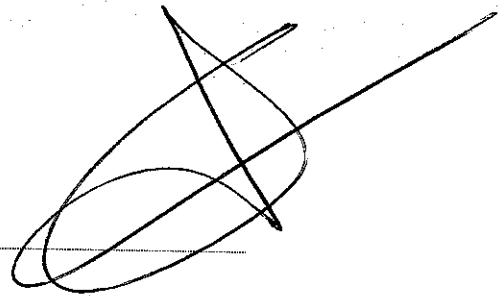
On behalf of

Organization

Job Title

Name and Surname

Location, day month year

Signature field

On behalf of

Organization   Dirección General de Tráfico (DGT)

Job Title   Deputy Director General of Mobility

Name and Surname   Jorge Ordás Alonso

Location, day month year   Madrid, 28 october 2020

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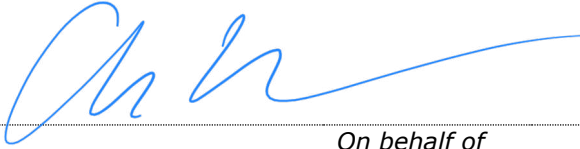
On behalf of

Organization

Job Title

Name and Surname

Location, day month year

Signature field

On behalf of

Organization   Intelligent Traffic Management Finland Ltd

Job Title   Chief Executive Officer

Name and Surname   Aapo Anderson

Location, day month year   Helsinki, 29.11.2020

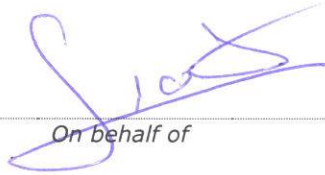**Signature field (optional)**

On behalf of

Organization

Job Title

Name and Surname

Location, day month year

Signature page belonging to ´Multi Party Agreement Deployment of the SRTI Ecosystem: Data for Road Safety d.d. November 1 2020´.

Signature field

DocuSigned by:

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On behalf of

Organization   Traffic Management Finland Oy

Job Title   toimitusjohtaja

Name and Surname Pertti Korhonen

Location, day month year

Signature field (optional)

On behalf of

Organization

Job Title

Name and Surname

Location, day month year

Signature field

FEDERAL MINISTRY OF TRANSPORT
AND DIGITAL INFRASTRUCTURE
GERMANY

On behalf of
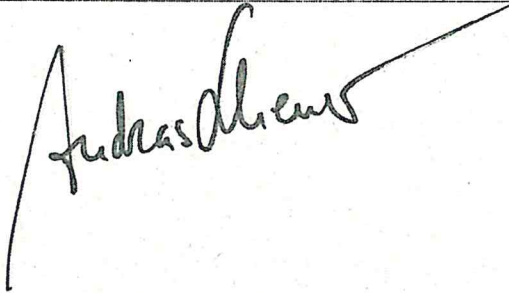
Organization

Job Title

Name and Surname

BERLIN 30 OCTOBER 2020

Location, day month year

Signature field

On behalf of

Organization   Luxembourg Ministry of the Economy

Job Title   Director General for Research, Intellectual Property and New Technologies

Name and Surname   Mario GROTZ

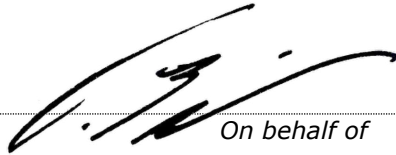Location, day month year   Luxembourg, 29/10/2020

Signature field (optional)

On behalf of

Organization   Luxembourg Ministry of the Economy

Job Title   Director Sustainable Technologies

Name and Surname   Christian TOCK

Location, day month year   Luxembourg, 29/10/2020

Signature field

On behalf of

Organization   Mercedes-Benz Connectivity Services GmbH

Job Title   Head of Operations, Ventures & Legal

Name and Surname   Tristan Kleiner

Location, day month year Stuttgart, 26.10.2020

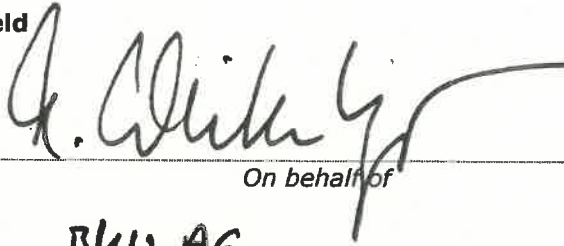**Signature field (optional)**

On behalf of

Organization   Mercedes-Benz Connectivity Services GmbH

Job Title   CEO

Name and Surname   Christoph Ludewig

Location, day month year   Stuttgart, 26.10.2020

Signature field

i.V. *[signature]*

On behalf of

Organization   BMW AG

Job Title   VP BUSINESS LINE MY JOURNEY

Name and Surname   MICHAEL WÜRTENBERGER

Location, day month year   Munich, 10/11/2020

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i.V. *[signature]*

On behalf of

Organization   BMW AG

Job Title   VP Governmental and External Affairs

Name and Surname   Munich, 13/11/2020

Location, day month year   Glenn Schmidt

Signature field

On behalf of

Organization   FMD MOBILITY.

Job Title   DIRECTOR, ENTERPRISE CONNECTIVITY

Name and Surname   MARK HARVEY

Location, day month year   LONDON 26th OCTOBER 2020.

Signature field (optional)

On behalf of

Organization

Job Title

Name and Surname

Location, day month year

Signature page belonging to ´Multi Party Agreement Deployment of the SRTI Ecosystem: Data for Road Safety d.d. November 1 2020´.

Signature field

DocuSigned by:

Stefan Verstraeten

89CEAEE65535492...

On behalf of

Organization	TomTom Traffic B.V.
Job Title	Director
Name and Surname	Stefan Verstraeten
Location, day month year	

Signature field (optional)

On behalf of

Organization	
Job Title	
Name and Surname	
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Legal
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HERE Europe B.V.
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5611 ZT Eindhoven
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On behalf of

Organization
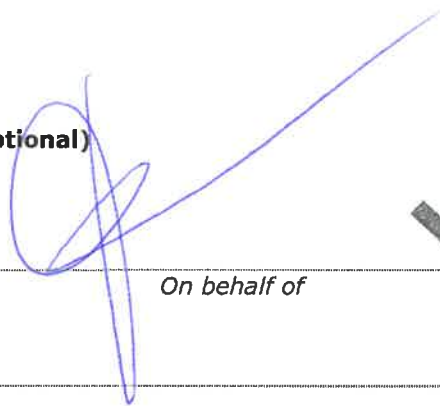
Job Title

R.A.J. Houben
Managing Director

Name and Surname

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Signature field (optional)

HERE Europe B.V.
Kennedyplein 222-
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the Netherlands
+31.40.7441242

On behalf of

Organization

Job Title
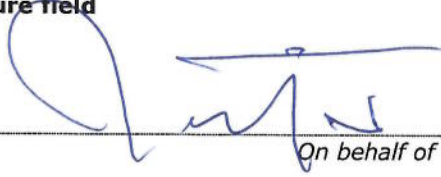
F. M. van Haaren
Managing Director

Name and Surname

Location, day month year   2 7 OKT 2020

Signature page belonging to ´Multi Party Agreement Deployment of the SRTI Ecosystem: Data for Road Safety d.d. November 1 2020´.

Signature field

On behalf of

Organization   VOLVO CARS

Job Title   VICE PRESIDENT AD & MOBILITY

Name and Surname   JOHAN TAWS

Location, day month year

GOTHENBURG, 29/10-2020

Signature field (optional)

On behalf of

Organization   VOLVO CARS

Job Title   DIRECTOR SAFETY & DRIVER ASSISTANCE STRATEGY

Name and Surname   EVA LAHTI

Location, day month year

GOTHENBURG 29/10 2020

Signature page belonging to 'Multi Party Agreement Deployment of the SRTI Ecosystem: Data for Road Safety d.d. November 1 2020'.

Signature field

Getekend door: Tom Roelants (Signature)
Getekend op: 2020-10-23 08:52:08 +00:00
Reden: Ik keur dit document goed

Tom Roelants

On behalf of

Organization
- Agentschap Wegen en Verkeer (Belgium)

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- Administrateur-generaal

Name and surname·
- Tom Roelants

Location, day month year·
Brussel, 23-10-2020

Signature field (optional)

On behalf of

Organization

Job Title

Name and Surname

Location, day month year

Signature page belonging to ´Multi Party Agreement Deployment of the SRTI Ecosystem: Data for Road Safety d.d. November 1 2020´.

Signature field

	On behalf of
Organization	AUTOBAHNEN- UND SCHNELLSTRASSEN-FINANZIERUNGS-AKTIENGESELLSCHAFT (ASFINAG)
Job Title	Managing Director ASFINAG Maut Service GmbH
Name and Surname	Mag. Ursula Zechner
Location, day month year	Vienna,

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	On behalf of
Organization	AUTOBAHNEN- UND SCHNELLSTRASSEN-FINANZIERUNGS-AKTIENGESELLSCHAFT (ASFINAG)
Job Title	Head of Department Customer Management ASFINAG Maut Service GmbH
Name and Surname	Mag. Werner Fritz
Location, day month year	Vienna,

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On behalf of

Organization NIRA Dynamics AB

Job Title Business Unit Manager, Road Perception

Name and Surname Andreas Andersson

Location, day month year Linköping, SE, 02.11.2020

Signature field (optional)

On behalf of

Organization

Job Title

Name and Surname

Location, day month year

Signature field

On behalf of

Organization

Highways England

Job Title

Chief Information Officer

Name and Surname

Victoria Higgin

Location, day month year

10/11/2020

INCREASING ROAD SAFETY BY SHARING ROAD SAFETY RELATED DATA IN PUBLIC AND PRIVATE COOPERATION

Annex 1 belonging to ´Multi Party Agreement Deployment of the SRTI Ecosystem: Data for Road Safety d.d. November 1 2020´

SRTI Ecosystem Technical Documentation

Data Task Force

VERSION	DATE	AUTHOR/S	COMMENTS
1	05/10/20	M.ISMAIL K. DRYSDALE	FIRST ISSUE
1.01	06/10/2020	M. ISMAIL	ADDED CORRECT LINK TO FOOTNOTE IN APPENDIX 3

Contents

Tables

Figures

Acronyms

Table 1: Acronyms

Acronym	Definition
API	Application Programming Interface
CEN	Comité Européen de Normalisation (European Committee for Standardization)
DTF	Data Task Force
EU	European Union
HTTPS	Hypertext Transfer Protocol Secure
JSON	JavaScript Object Notation
PoC	Proof of Concept
OEM	Original Equipment Manufacturer
MDM	Mobility Data Marketplace
RRP	Recommended Reference Profile
SENSORIS	Sensor Interface Specification
SRTI	Safety Related Traffic Information
L2	Level 2 Data
L2'	Level 2 Prime Data
L3	Level 3 Data
XML	Extensible Mark-up Language

1.0   Introduction

The purpose of the Data Task Force (DTF) is to take the first steps towards data sharing for Safety-Related Traffic Information in Europe.

The Data Task Force is the first project in the European Union (EU) and the largest project in the world, focusing on improving road safety by means of the large-scale use of vehicle data and aiming to improve safety on European roads, on a reciprocal basis. The project is unique because of the profound public-private cooperation. A proof of concept (PoC) has started in several European countries, in which vehicle data can be shared for the purpose of Safety-Related Traffic Information (SRTI). Industry leaders have agreed to cooperate and are willing to share relevant data.

In October 2020, partners of the PoC are planning to sign a Multi-Party Agreement (MPA) to continue the activities initiated by the PoC. This document lays out the technical foundation for the SRTI ecosystem first laid out in the PoC and planned to continue via the MPA.

1.1   Project Aim

The aim of the PoC was to create an SRTI Ecosystem where Original Equipment Manufacturers (OEMs), service providers and public authorities can share their safety critical data. The SRTI Ecosystem can be thought of as an area where all safety information from all participating parties can be found (something like an internet for vehicle safety messages). The Proof of Concept (PoC) tested the sending and receiving of Safety Related Traffic Information (SRTI) between vehicles and road authorities. The collaboration effort between consortium members means that all data shared by each member can be utilised by others in the consortium. There are no obligations for parties to use the data that is available in the SRTI Ecosystem.

The DTF supports the implementation of existing EU laws on access to safety data. By prioritising access to safety data and enabling collaboration between vehicle manufacturers and countries, the DTF aims to enhance traffic safety for all road users.

2.0   Data Categories

The data categories in Table 2 have been identified by the Delegated Regulation (EU) 886/2013 to be cases that are deemed safety related.

Table 2: Data Categories identified by Delegated Regulation (EU) 886/2013

Data Category No:	Title	Description
1	Temporary slippery road	Activation events of the electronic driving dynamic stabilisation program of the vehicle ("lamp on"), absolute friction values as detected by the vehicle ("µ")
2	Animal, people, obstacles, debris on the road	Object recognition from rich sensors for outside situations OR emergency call / breakdown call from ego-vehicle, where ego-vehicles are vehicles equipped with sensor technology.
3	Unprotected accident area	Object recognition from rich sensors for outside situations OR emergency call / breakdown call from ego-vehicle
4	Short term road works	Sign recognitions of road work signs
5	Reduced visibility	Activation events of the vehicle light (fog lights), rain sensor data, wiper activation
6	Wrong way driver	Object recognition from rich sensors for outside situations OR ego-vehicle detection by sign-recognition
7	Unmanaged blockage of a road	Object recognition from rich sensors for outside situations
8	Exceptional weather conditions.	Activation events of the vehicle light (fog lights), rain sensor data, wiper activation, activation events of the electronic driving dynamic stabilisation program of the vehicle ("lamp on"), absolute friction values as detected by the vehicle ("µ").

2.1   SRTI Ecosystem Stages

Each Party shall fulfil at least one of the following main roles within the SRTI Ecosystem:

Figure 1: SRTI Ecosystem Stages

Stage 1: An OEM or public authority will be sharing raw data to all requesting parties.

Stage 2: An Aggregator will share the processed and cleansed data from Stage 1 that has been acquired through the SRTI Ecosystem to all requesting parties.

Stage 3: The Service Creator will ingest data from stage 1, 2, 3 and/or external data sources, it will then begin to aggregate to create a safety related event that can then be shared to all parties. It is important to note that once a service creator creates new set of data from previously aggregated data, this newly created data can be used by another Service Creator to further create additional safety related notifications. Therefore, once the service creator creates new data, they also must feed that data back into the system for other service creators to use.

Stage 4: The Service Provider will provide finalised data (output of the Service Creator) acquired through the SRTI Ecosystem directly to End Users, free of charge.

2.2   Data Types & Definitions

2.2.1   Level 2 Data / Data (L2)

Data (L2) is defined as the raw data made available to the SRTI Ecosystem that can be used for creating road safety related minimum universal traffic information. This data is collected via any private and/or public source, also referred to as 'road safety related traffic data (as defined in article 2-m of Regulation 886), also referred to as "Level 2 Data";

2.2.2   Level 2' Data / Data (L2')

Data (L2') is an enriched version of Data (L2) made available to the SRTI Ecosystem and created by cross referencing the Data (L2) across multiple L2 data sources and/or through data harmonization and cleansing of the Data (L2), also referred to as "Level 2 Prime Data; Level 3 Data / Data (L3)

Any extracted, aggregated and processed road safety related traffic information made available to the SRTI Ecosystem, offered by public and/or private road operators and/or service providers to End Users through any delivery channels, also referred to as "L3 Information"" or "Road Safety Related Minimum Universal Traffic Information" or "SRTI" (as defined in article 2-n of Regulation 886;L3 data is generated by merging available data, including the fusion with L2/L2' data, to an event within the (a)-(h) categorization of the Regulation 886 and compliant with the Regulation 886. L3 data can extend L2' substantially with information not contained in L2'.

2.3 Roles within the SRTI Ecosystem

At each stage of the data flow architecture, there are associated roles that are to be executed by specific parties.

These roles are as follows:

2.3.1 Data Source

- A Party that generates Data (L2), Data (L2') and/or Data (L3)
- The Data Source is responsible for contributing original, new Content into the ecosystem
- A typical L2 Data Source would be a vehicle OEM contributing L2 Data to the ecosystem

2.3.2 Data Access Interface Provider (L2)

- Provides access to L2 data
- For vehicle L2 data usually executed by an OEM or a delegated entity
- For public authority L2 data usually executed by road operator

2.3.3 Aggregator (L2 to L2')

- A Party that uses Data (L2) to create Data (L2') e.g. by harmonizing and cleansing L2 data from L2 data sources.

2.3.4 Data Access Interface Provider (L2 Prime)

- Provides access to L2 prime data (Refer to *Appendix 1 - L2' Data*)

2.3.5 Creator (L3)

- A Party that creates Data (L3) from varying sources including Data (L2) and/or Data (L2') and/or Data (L3) acquired through the SRTI Ecosystem and/or external data sources.

2.3.6 Data Access Interface Provider (L3)

- Provides Access to L3 data

2.3.7 Service Provider

- A Party that renders and distributes Data (L3) acquired through the SRTI Ecosystem directly to an end user (i.e. driver in vehicles).

For further technical details regarding the data flow architecture, please refer to *Appendix 1 – Stages for Data Flow*.
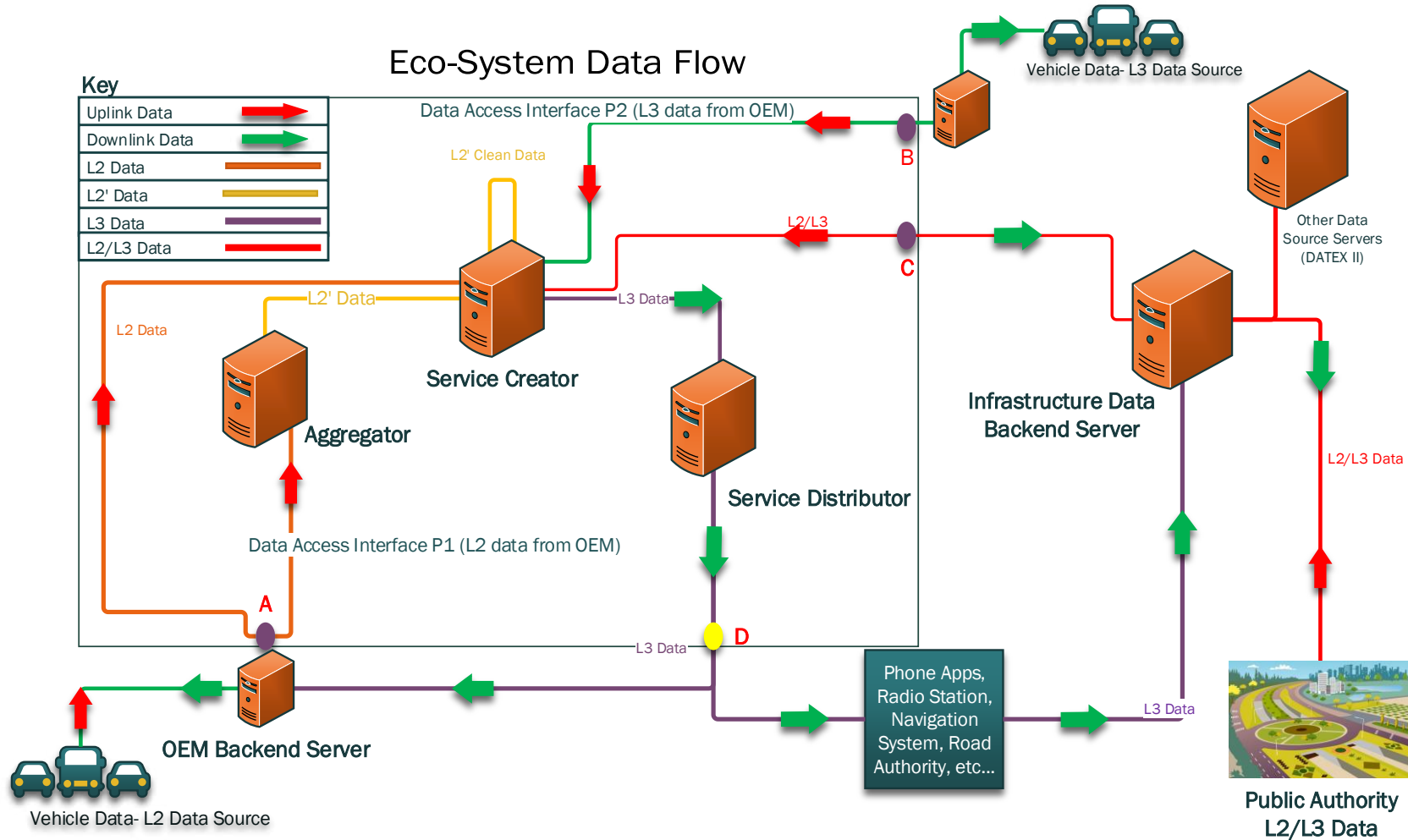
3.0   SRTI Ecosystem Architecture

Figure 2: SRTI Ecosystem Overview Architecture

4.0   Members within the SRTI Ecosystem

4.1   OEM Member

An OEM (car manufacturer) main task within the SRTI Ecosystem is to share SRTI data to all requesting parties, these data types are either L2 or L3 data types. Thus, they are a Data Source (L2 or L3).

Examples of OEM members within the SRTI Ecosystem are:

- Ford
- BMW
- Daimler

4.2   State Member

A State member has the commitment within the SRTI Ecosystem to share public authority L2 and L3 data to all requesting parties and provide a NAP.

Example of States within the SRTI Ecosystem are:s

- Luxembourg
- Highways England
- Austria/ASFINAG

4.3   Examples of Existing Role Holders

The following is a list of examples of the existing role holders within the SRTI Ecosystem.

L2 Data Source

- Ford
- Audi

L2 Data Access Interface Providers:

- HERE on behalf of BMW
- Daimler
- HERE on behalf of Ford

L2/L2' Aggregator:

- HERE
- NDW
- Post Luxembourg

Service Creators:

- Tom Tom
- NDW
- Post Luxembourg

L3 Data Interface Providers:

- Volvo
- HERE on behalf of NIRA
- Public Authority (Highways England, MDM, Rijkwaterstaat)

Service Providers:

- HERE
- Volvo
- Asfinag Austria

5.0   Data

In the context of incoming sensor data to the SRTI Ecosystem, within the previously mentioned 8 use cases various sensor signals can potentially be used. However, it must be accounted for the fact, that the sensor signals in the vehicle/infrastructure can be aggregated and processed in the data supplier backend before entering the SRTI Ecosystem.

Vehicle and Infrastructure data sets are classified into the following categories:

- L2 Data
- L2' Data
- L3 Data - *For further technical details the L2/L3 mapping profile can be found in appendix 1*

5.1   Data Standards

5.1.1   DATEX II

DATEX II is a standard for modelling and encoding data regarding road traffic and travel information. It focuses on data that is relevant to traffic management and for planning and performing a journey, pre- and on-trip. This standard is formally covered by the multi-part CEN 16157 series. The current standard model that covers safety related information for drivers is CEN EN 16157-3:2018. The technical documentation for implementing the standard as well as further guidance can be obtained from the DATEX II website at datex2.eu.

The DATEX II approach supports multiple different implementation platforms, where XML – with transfer syntax being validated by an XML Schema Definition – is the reference platform and is explicitly covered by the CEN standard document. New developments include alternative encoding platforms like JSON Schema and ASN.1 Encoding Rules, but these are not yet part of the standard.

The application of DATEX II is based on generating individual data profiles from the standardised models for publications. These profiles can be chosen to be compliant to Recommended Reference Profiles (RRP) that cover compliance with Delegated Regulations from the European Commission. The Data Task Force Technical Group has produced such a profile for SRTI information created from vehicle L2/L2' data, based on the RRP for Delegated Regulation (EU) 886/2013 regarding safety related traffic information. The profile uses a mechanism in DATEX II called "Level B extensions" that can extend data models in a backward compatible way to add some small features that were seen as useful by group members but not available in this form in the model from CEN EN 16157-3.

5.1.2   SENSORIS

The Sensor Interface Specification (SENSORIS) defines an interface for requesting and sending vehicle sensor data from vehicles to clouds and across clouds. The specification and its standardisation focus on the content and encoding of the interface.

SENSORIS differentiates between the following three actor roles:

- Service Cloud
- Vehicle Cloud
- Vehicle Fleet

A vehicle is part of a vehicle fleet. The vehicles of a vehicle fleet communicate with a vehicle cloud. A vehicle cloud can also communicate with a service cloud. A cloud instance can have both the role of a vehicle cloud and a service cloud. However, if a cloud instance has only the role of a service cloud, then it cannot communicate with a vehicle fleet. An example setup could be that vehicles of an OEM vehicle fleet communicate with their OEM vehicle cloud. The OEM vehicle cloud in turn communicates also to the service cloud of a map maker.

The interface of SENSORIS defines content and encoding of the messages that are communicated between the actor roles. Data messages contain vehicle sensor data. Data messages communicated from one vehicle of a vehicle fleet to its vehicle cloud contain sensor data from the one vehicle. Data messages communicated from a vehicle cloud to a service cloud contain data from individual vehicles or aggregated data from several vehicles of a vehicle fleet. Job request messages contain jobs defining which vehicle sensor data is requested under which conditions and when the data shall be communicated to the requesting cloud. Job status messages contain information about termination of jobs. Job status messages communicated from a vehicle of a vehicle fleet to its vehicle cloud or from a vehicle cloud to a service cloud contain the reason of the termination of the job in the vehicle or vehicle cloud. Job status messages communicated from a service cloud to a vehicle cloud or from a vehicle cloud to a vehicle of a vehicle fleet request the termination of the job. Detailed description of SENSORIS and further technical information can be found in *Appendix 2 - SENSORIS Data Format*

NB: At time of writing this document SENSORIS version 1.2 is the encouraged standard to be used.

5.2   Data Harmonisation

5.2.1   Level 2

For L2/L2' data, it has been decided that the basic elements possible to structure such data would be agreed by all signatories. In addition, a simple set of additional attributes to describe these elements (e.g. location) were also agreed.

No specific standard of format has been prescribed, however it has been identified that the requirements for SRTI Ecosystem data are similar to that of SENSORIS standards, therefore Data Task Force has worked closely with SESNORIS to influence their latest release to include the requirements for data flow within the SRTI Ecosystem. SENSORIS is used by all OEM L2 providers and is strongly recommended for new OEM L2 data sources. was recommended.

There is no common specification of the actual access technology used, but all data feeds are requested to use open standards only for this purpose, and to accompany their data feed with clear guidance and documentation that is sufficiently detailed to allow system developers to implement a client against this data feed.

Further details can be found in Appendix .

5.2.2   Level 3

For Level 3 data it has been agreed to follow the recommendation of Delegated Regulation 886/2013 to provide the data encoded in DATEX II according to the CEN 161517 series of standards. The Technical group identified that the DATEX II organisation had published a Recommended Reference Profile (RRP) on the datex2.eu website. This mechanism allows for the creation of data profiles that have a proven compatibility with the requirements of the Delegated Regulations. Since such RRPs are not complete data profiles, the group agreed to develop a dedicated DATEX II profile – compliant with the RRP – that would be suited for L3 data feeds created out of vehicle based L2/L2' data.

This profile has been published for direct references on the DATEX II website at:
https://datex2.eu/profiles/srti/fromvehicledata/v1.

Further details can be found in Appendix 3 3 – DATEX II Data Format.

5.3   Metadata Repository - Mobility Data Marketplace (MDM)

For partners to know which data is available where and in what format, metadata for the data access interfaces needs to be made available to all partners. Since not all data access interfaces are public, a protected, SRTI Ecosystem partner internal metadata repository is required.

For now, all metadata is to be made available at the MDM (Mobility Data Marketplace) repository at https://service.mdm-portal.de . This is the German NAP and currently acts as an intermediate solution.

The following is the step-by-step instruction for creating so-called "data publications" (metadata for one data access interface) within the MDM.

5.3.1   User certificates

In order to be able to enter and edit metadata in the MDM, a user certificate is required. The MDM operates with authentication via X.509 certificates (as opposed to username, password).

Follow the following steps to set this up:

1. Send an email to Timo Hoffmann at hoffmannt@bast.de,CC to mdm@bast.de with your affiliation/organization name, email address and mobile phone number (the mobile phone number is used to send the password for the certificate).
2. You will receive (usually the next working day at the latest) an email with a verification link. Click on the link to activate your account.

3. You will receive (usually the next working day at the latest) a X.509 certificate to your email address and the password to the mobile number you provided via text message.
4. Install the certificate to your operating system and/or browser.
5. In case you need any help with the certificate, send an email to orga@mdm-portal.de for further help.

5.3.2 Create contact person

For each data publication, there needs to be a contact person. In order to be able to select yourself (or your organisation's) contact person for the data access interface to the Data Task Force, it is required that you create a contact person, if you have not done so already.

1. Go to https://service.mdm-portal.de,
2. Switch to English language
3. "Log-in" (only works with installed certificate)
4. Go to "My organization"
5. "Add new contact" and add your contact details (deselect system notifications)
6. Save

5.3.3 Create data publication

For every data access interface that your organization is making available to the DTF ecosystem, you must do the following:

1. Go to https://service.mdm-portal.de
2. Switch to English language
3. "Log-in" (only works with installed certificate)
4. Go to "Publications", "Create publication"
5. "Yes" if your publication is in DATEX II format and you want to use MDM brokering. In all other cases choose "No".In Step 2 in all relevant fields as detailed as possible
    - Choose the right contact person (you)
    - Make it non searchable to keep the info amongst our group (for now)
    - Leave "Valid from" and "Valid to" empty
    - Data category "Unexpected road events and conditions" (category detail empty)
    - Transport modes "Car" and "Truck" (leave at this even though data might apply for more)
    - Conditions of use "License and free of charge"
6. In Step 3 fill in all relevant fields as detailed as possible
    - Geographical coverage: "NUTS 0: Deutschland" (this is a known limitation of the system)
    - Road network coverage choose all "Motorways", "Federal and state roads" and "Urban roads"
    - Reference file could be further documentation of the data
7. In Step 4 fill in all relevant fields for access information as detailed as possible
    - Data format e.g. "Protocol buffers", "other", "SENSORIS"
8. In Step 5 (Confirmation) choose "no" to not submit your self-declaration to the German national body and verify your submitted information.
9. Save publication

6.0   Development Work Required for Sharing & Receiving Data

The following are examples of the development work and methodologies that are required for sharing and receiving data. The examples are indicative and therefore members are under no obligations to adopt any of the approaches that have been listed below.

6.1   L2 Data Provider

L2 Data is collected via vehicles or infrastructure is provided to the ecosystem. Vehicle data comes usually from the OEMs and infrastructure data from the member states. When the data is aggregated from different sources it is called L2' prime data. One example of L2 Data is broken down vehicle provided by Daimler or road weather sensor data provided by member states.

6.2   Data Aggregator

As a Data Aggregator, NDW role is to collect and aggregate the L2-feeds of different data providers including BMW, Daimler and Ford. NDW have successfully aggregated both BMW and Daimler data into a single feed, however Ford have yet to migrate from SDII-format to Sensoris.

Once Ford has migrated to Sensoris, NDW can begin to ingest their data and combine it into a single feed. The combined feed is available in JSON format, as this is an easier format for data scientists to process.

6.3   Creator

As a Service Creator, Post Luxembourg role is to create L3 Data from varying sources including L2 Data, L2' Data and/or L3 Data. This data is acquired through the SRTI Ecosystem and/or external data sources.

The following demonstrates the step process required to implement for the receiving, computing and sharing of Data:

1. Set up a technical architecture to get real time L2, L2' and L3 data to be combined with cold data;
    - Message queue mechanism e.g. Kafka and MQTT.
    - Specific Data Storage for high velocity data retrieval (key-value system like HBase)
    - API implementation and exposition for data sharing
2. Subscribe to the dedicated provider to get OEM/non-OEM L2, L2' and L3 data, implement the interfaces and data parsers.
3. Implement a L3 creation process;
    - Filter, cleanse and aggregate input data
    - Data quality rules
4. Implement an API to share generated L3 data in real time in DATEX II.
5. Expose the API through your internal API Manager and/or through the German MDM.

6.4   L3 Data Provider

6.4.1   OEM

As an OEM and L3 Data Provider, Volvo holds the responsibility of providing access to L3 Data. The list below demonstrates the requirements of a Data Provider from the perspective of an OEM. The Integration to NDW (see 6.2) interchange node work items as follows:

1. Obtaining security credentials for all environments (test + production)
2. Implementation of transformation from internal data representation format to the SRTI DATEX profile
3. Implementation of integration adaptor to interchange node
4. Deployment and verification in test environment
5. Deployment to production environment

Table 3 summarises the different difficulty levels for each of the above steps.

Table 3 Difficulty levels of steps required for integration to NDW interchange node

Difficulty	Step
Low	1, 4, 5
Medium	3
High	2

6.4.2 Road Authority

6.4.2.1 Implementation requirements

ASFINAG provides data interface for the streaming of all its traffic data based on the DATEX II traffic data model. The setup of a system with registration and key-based data access did require a central data distribution server as a pre-requisite as well as the implementation of a registration portal and a data streaming frontend. The frontend is a two-tier system comprising of an xml-creator to translate database data into xml format and a REST-interface module to pack the xml data into the transmission packet for the subscriber interface.

The complete list of implemented items indicates a considerable overall effort:

- Pre-requisite: Central Data Distribution Server
- Gateway to the Central Data Distribution Server
- Connector Manager module to create DATEX II packets according to profiling
- Frontend to handle subscriber polling and push transactions
- Web portal for registration and acquisition of Resource Keys for data access

However, a central Data Distribution Server, which converts data from all the legacy interfaces in the field into a normalized database structure, would in many cases already exist independent of L3 services. Likewise, a web portal is usually already available, so the registration and provision of Resource Keys only have to be added on.

6.4.2.2 Implementation aspects

Modular approach

As a principle, monolithic components should be avoided. Providing an L3 data stream from various sources for various output formats in multiple versions is a rather complex endeavour, so it is advisable to stick to a highly modularized architecture. We did not build a single data transformer from database to interface, but instead ended up with a Serializer to transform data from the central database into a specific data model i.e. DATEX II & SENSORIS, or DENM Converter to convert the data into a specific format, i.e. XML, PROTOBUF, or ASN.1an Uploader, to transmit the data to the interface

Asynchronous approach

In addition to providing the correct format to the interface, there is also the matter of data volume to be considered. Data passes through various gateways before arriving at the interface, which are all prone to data clogging at some point or other. Designing an asynchronous hand-over at these critical points – no "waiting" for anything at the receiving end – ensures that the clogging of one gateway does not lead to a domino effect which will eventually kill the system. Instead the fault can then be pin pointed by a monitoring system and quickly resolved.

Elementarization and versioning

As mentioned above, a key factor in being able to maintain the servicing of a number of subscribers with contrasting use cases, is to elementarize the data content, so that the subscriber picks needed elements and aggregates on his end. This also enables a high system availability, as the failure of one element or channel does not affect the others. The same goes for a strict versioning of the elements. There may be subscribers who need additional data fields in a new version. This has to be implemented while leaving the other versions untouched, as they may have had to pass a rigid test regime by other subscribers.

<u>Tool Specification</u>

All software was built in C# and Java environments.

The subscriber interface is realized as a REST-interface in HTTPS for polling of DATEX II, as well as PUSH variant for specific subscribers requiring this.

For authentication we use unique Resource Keys which are provided to customers via the official ASFINAG website asfinag.at. A resource key is unique for a resource and a customer. If another customer requests the same resource, a new Resource Key is generated.

The following is an example API call to request SRTI data:

https://content.asfinag.at/services/resource/<customer resource key>

6.5   Technical Support

Current members of the consortium should commit to providing advice and technical support to any new members joining the consortium. Should any new members require support or have any questions, they should contact the appropriate consortium member.

Appendix 1

Detailed Data Definitions

L2 Data

In the context of vehicle sensor data, various sensor signals can potentially be used to create one of the 8 categories of the SRTI. However, it must be accounted for the fact that the sensor signals in the vehicle can (and must be) aggregated and processed in the vehicle and/or in the OEM backend before being delivered to the outside world.

Example: A signal that is broadcasted once every 100ms on a vehicle bus might be aggregated to provide a mean value (or maximum value, or minimum value etc.) for a defined period of time before being sent by the vehicle. All data falling in that category are so-called "Level 1" data and are not further specified in the context of the EU Data Task Force.

The following shall list some examples of Level 1 data in the categories. Note, this data is not necessarily available within certain OEMs vehicles or might not be possible at all (especially in the case of object recognition capabilities based on visual sensors such as cameras, radars, LIDARs, etc) in the current state of the art:

The following data categories have been identified by the Delegated Regulation (EU) 886/2013 to be cases that are deemed safety related:

1. **Temporary slippery road**: Activation events of the electronic driving dynamic stabilization program of the vehicle ("lamp on"), absolute friction values as detected by the vehicle ("μ"), etc.
2. **Animal, people, obstacles, debris on the road**: object recognition from rich sensors for outside situations OR emergency call / breakdown call from vehicles
3. **Unprotected accident area**: object recognition from rich sensors for outside situations OR emergency call / breakdown call from ego-vehicle
4. **Short-term road works**: recognitions of road work signs
5. **Reduced visibility**: activation events of the vehicle light (fog lights), rain sensor data, wiper activation, etc.
6. **Wrong-way driver**: object recognition from rich sensors for outside situations OR ego-vehicle detection by sign-recognition
7. **Unmanaged blockage of road**: object recognition from rich sensors for outside situations
8. **Exceptional weather conditions**: activation events of the vehicle light (fog lights), rain sensor data, wiper activation, activation events of the electronic driving dynamic stabilization program of the vehicle ("lamp on"), absolute friction values as detected by the vehicle ("μ"), etc.

The main characteristics of L2 data are as follows:

- The data can originate from varying sources (rich sensors, classical sensors, driver behaviors, etc.)
- L2 data is pre-processed
- It can be discrete events or analogue values

It is suggested, that each value two data object is categorized along the following categorization scheme, which should allow the data users to qualify the data concerning the confidence level that the data point should be treated with along the processing chain.

The following are examples of a datatype set regarding the L2 signal:

- In-Vehicle User Interface Element triggered by customer - Example: wiper, manual breakdown call)

- In-Vehicle User Interface Element triggered by vehicle regularly - Example: ABS Lamp, Stability Program Lamp)
- In-Vehicle User Interface Element triggered by vehicle rarely - Example: automatic e-call, automatic breakdown-call
- Simple Sensor Reading, minimally processed - Example: temperature, friction value representing a known physical value
- Locally simple combined sensor data - Example: sending ABS only if brake force <x
- Locally complex fused sensor data - Example: rain density by locally fusing wiper frequency and rain sensor data with speed and windshield angle
- Complex object detection - Example: object detection by camera

It is important to note that the provision of L2 data is the responsibility of the OEM.

L2' Data

Level 2' Data is an enriched version of Level 2 (L2) Data created by cross referencing the Data (L2) across multiple L2 data sources and/or through data harmonization and cleansing of the Data (L2), also referred to as "Level 2 Prime Data".

With the characteristics of L2 data outlined in the preceding section, the Level 2' data is characterized by processing L2 data from various sources to make the further processing more efficient.

Tasks performed in providing Level 2' data from Level 2 data can be a one or more of the following:

- Creating L2 data from various sources accessible in a consistent manner
- Harmonizing L2 data (e.g. normalizing sensor readings from absolute values in percentage values)
- Cleansing of L2 data for obvious errors (e.g. invalid values or locations)

The source of the original L2 data shall remain referenceable across the L2 to L2' processing to allow for the accountability of source specific characteristics. For the sake of clarity: all L2 data is by definition anonymous but may still be located by OEM. The mentioned reference ability shall only provide for the handling of source specific characteristics in the processing chain towards L2' and L3 (see below) and does not necessarily provide an OEM identification.

L3 Data Provider

<u>How data is made available</u>

ASFINAG provides a data interface for the streaming of all of its traffic data based on the DATEX II traffic data model. The data is secured by means of Resource Keys, which hold subscriber id, data stream and version thereof in an encrypted alphanumeric string, and which have to be included in every data poll request to the interface. In case the data is pushed to the subscriber, data is secured by means of certificates.

The Austrian National Access Point www.mobilitydata.gv.at directs potential subscribers to the ASFINAG web site www.asfinag.at. After registering and being cleared by ASFINAG staff, access is granted, and the subscriber can acquire Resource Keys for the desired DATEX II services.

<u>Organization of the data</u>

Data is organized into elementary parts in order to make it possible to service a multitude of subscribers from a variety of engineering interests. It is the data recipient who aggregates the required end product from these elements. DATEX II's profiling feature made this possible, where parts of the overall structure can be isolated. The data repository is advertised on www.datex2.eu, complete with all necessary documentation.

<u>European harmonization</u>

European initiatives, like the European Data Task Force, are gradually standardizing the elementary parts of DATEX II. The DTF has standardized the SRTI profile, which holds all unplanned, safety relevant events. This will be followed by the Traffic Regulations profile which will hold all road regulatory.

L2 Data Field Classification

L2 Data consists of multiple attributes that are categorised as the following:

- Mandatory attributes for all messages (M) – Fields that are required for the proper function of the use case temporal and geo localization, message identification, … (e.g. longitude, latitude and timestamp)
- Message Triggered content (T)
- Event type optional information (O) - Actual sensor readings that alone cannot derive SRTI content but may be used to identify false positives or negatives of an information (e.g. outside air temperature, actual acceleration

Table 4 below describes L2 data and how it can be used to create L3 events.

Table 4: DTF SRTI L3-L2 Mapping

Possible relevance to SRTI Data Types (M – Mandatory, T – Triggered, O – Optional)

Content	sortingID	L2 Signals	Example of a DataType set regarding the L2 Signal	Use Case A: Temporary slippery road	Use Case B: Animal/people/… on the road	Use Case C Unprotected accident area	Use Case D: short term roadworks	Use Case E: Reduced visibility	Use Case F: Wrong way driver	Use Case G: Unmanaged blockage of a road	Use Case H: Exceptional weather conditions
Mandatory	1	Unique Identifier		M	M	M	M	M	M	M	M
Mandatory	2	Position WGS84	long, lat in WGS84 coordinate system	M	M	M	M	M	M	M	M
Mandatory	3	Timestamp	time of event observation	M	M	M	M	M	M	M	M
Mandatory	4	Heading or Trace	0..360 - or list of positions	M	M	M	M	M	M	M	M
Mandatory	5	Confidence Level	A-G as per Glossary	M	M	M	M	M	M	M	M
Trigger	10	Event: Slippery Road	Boolean, Subcategory, SourceClassification	T							
Trigger	10	Event: Obstacle	Boolean, Subcategory, SourceClassification		T						
Trigger	10	Event: Accident	Boolean, Subcategory, SourceClassification			T					
Trigger	10	Event: Road Work	Boolean, Subcategory, SourceClassification				T				
Trigger	10	Event: Reduced Visibility	Boolean, Subcategory, SourceClassification					T			
Trigger	10	Event: Wrong Way Driver	Boolean, Subcategory, SourceClassification						T		
Trigger	10	Event: Road Block	Boolean, Subcategory, SourceClassification							T	
Trigger	10	Event: "Exceptional Weather Condition"	Boolean, Subcategory, SourceClassification								T
Trigger	20	System ESP	Boolean, SourceClassification	T							
Trigger	20	System Traction Control	Boolean, SourceClassification	T							
Trigger	20	Sensor meta: Visibility Distance	Value, Accuracy, SourceClassification					T			
Trigger	20	Road Surface: Friction Value	Value, Accuracy, SourceClassification	T							
Trigger	20	Traffic Sign: Road Work Signs	Compex Type, SourceClassification				T				
Trigger	20	Crash	Boolean, SourceClassification			T					
Trigger	20	Crash: battery cut-off	Boolean, SourceClassification			T					
Trigger	20	Crash: airbag deployment	Boolean, SourceClassification			T					
Trigger	20	System Automated Braking	Boolean, SourceClassification		T	T					
Trigger	20	Detected Object Data	Complex Type, SourceClassification		T					T	
Trigger	20	Connectivity: Ecall	Boolean, SourceClassification		T	T					
TriggerOptional	30	System ABS	Boolean, SourceClassification	T						O	

TriggerOptional	30	Windshield wiper	Value, SourceClassification	O				O			T
TriggerOptional	30	Detected Lane Geometry	Complex Type, SourceClassification		O			T			
TriggerOptional	30	Light Status: Rear Fog Light	Boolean, SourceClassification					T			O
TriggerOptional	30	Traffic Sign: Road Block Signs	Compex Type, SourceClassification					T		O	
TriggerOptional	30	ego-broken down vehicle	Boolean, SourceClassification			O				T	
Optional	40	Speed	Value, Accuracy, SourceClassification	O			O	O	O	O	O
Optional	40	System Emergency Braking	Boolean, SourceClassification		O	O			O	O	
Optional	40	Environment: Outside Air Temp	Value, Accuracy, SourceClassification	O				O			O
Optional	40	Sensor: Brake Pedal Pressure	Value, Accuracy, SourceClassification	O							
Optional	40	Dynamics: G-Forces	Value, Accuracy, SourceClassification	O							
Optional	40	Chassis: Suspension	Value, Accuracy, SourceClassification	O	O						
Optional	40	Environment: Humidity	Value, Accuracy, SourceClassification	O				O			O
Optional	40	Environment: Luminocity	Value, Accuracy, Type, SourceClassification					O			
Optional	40	Air Quality Information	Value, Accuracy, SourceClassification					O			O
Optional	40	Cross Wind Detection	Value, Accuracy, SourceClassification								O
Optional	40	Light status: Front Fog	Boolean, SourceClassification					O			O
Optional	40	Dynamics: Dangerours slow down	Boolean, SourceClassification		O	O				O	

Examples of the implementation of this interface will be showcased in a technical implementation guideline (Addendum to this document).
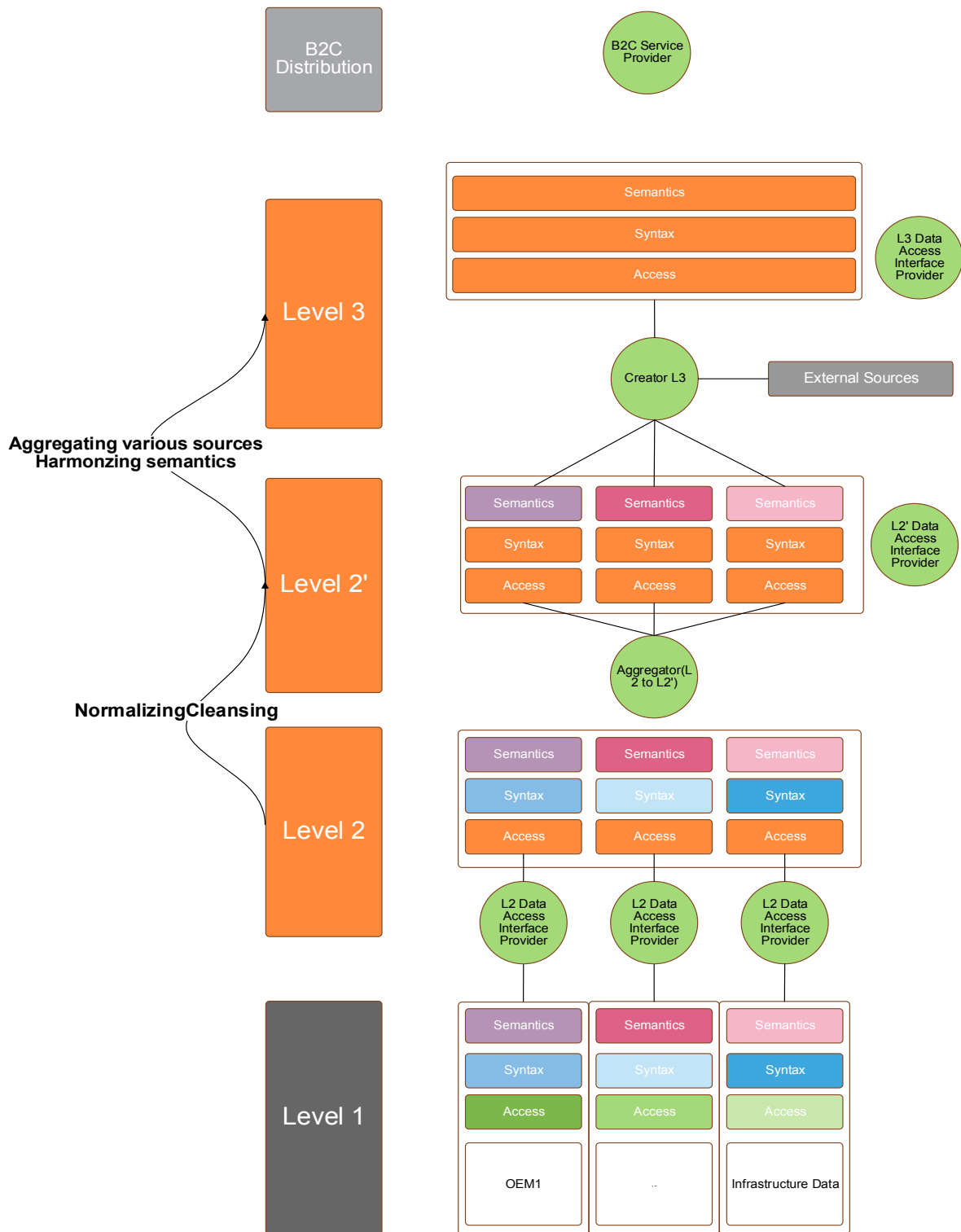
Stages for Data Flow

Figure 3 Stages for Data Flow

Appendix 2

SENSORIS Data Format

SENSORIS is not limited to just one instance of each actor role as shown in Figure 4, but is designed for cross collaboration in a setup with multiple actor roles as shown in Figure 5. A vehicle cloud can communicate with an arbitrary number of vehicle fleets. A service cloud can communicate with other service and vehicle clouds. For all communication channels the interface contains job request, job status, and data message types.
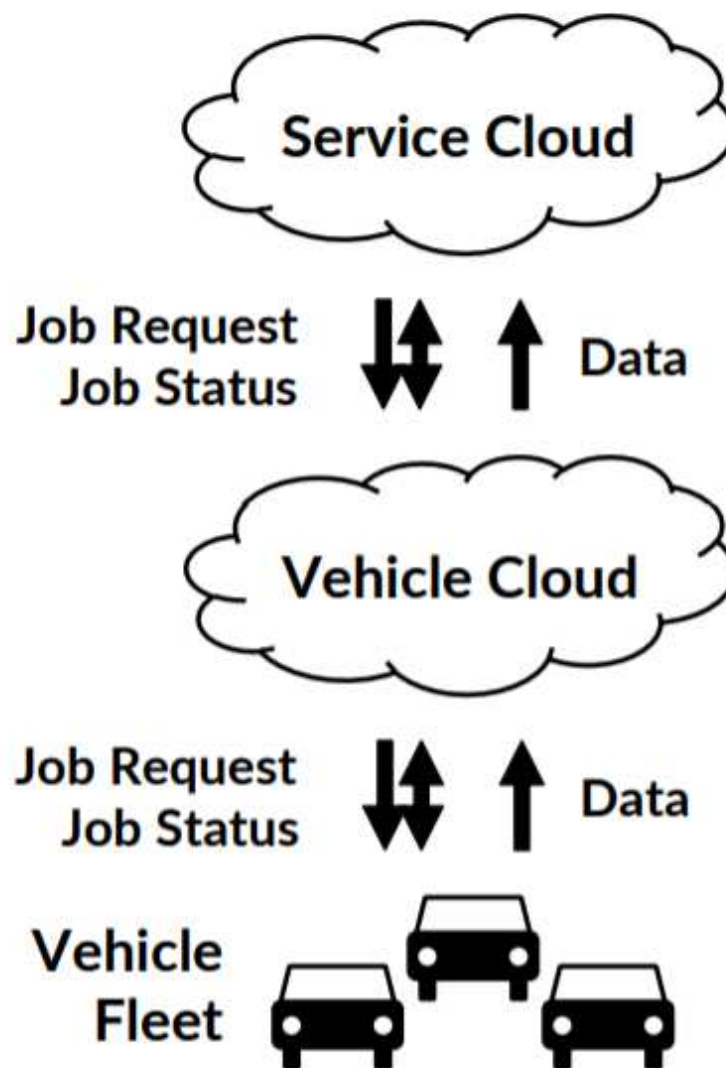
Figure 4 Actor roles and interfaces
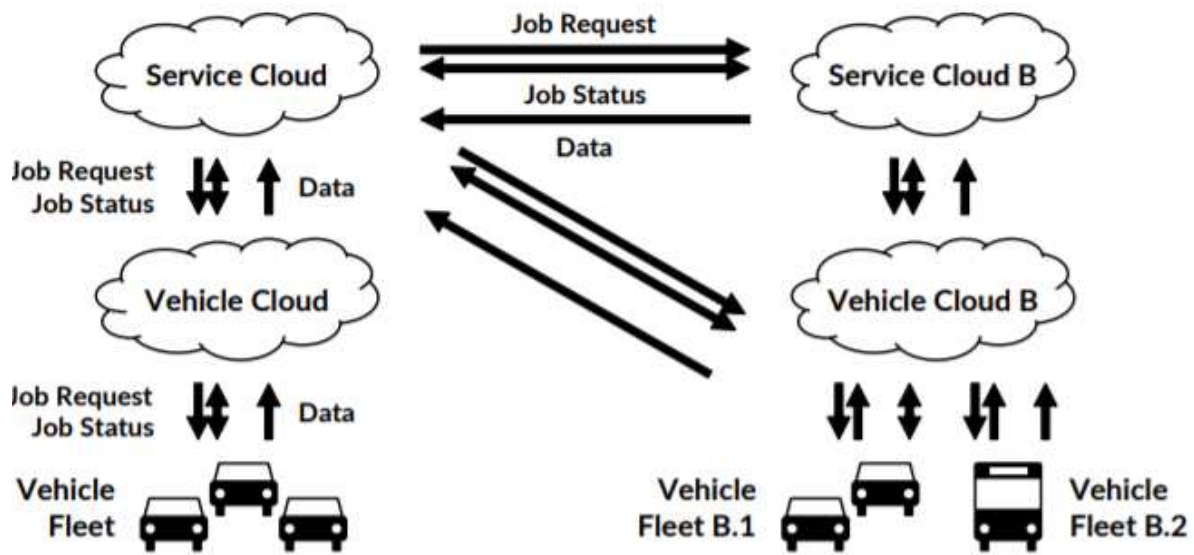
Figure 5 Multiple actor roles and interface

Interface Architecture

The interface architecture is purely limited to content and encoding of the SENSORIS interface. This limitation serves two purposes. The first purpose is to allow for a large variety of implementations. The SENSORIS interface shall be e.g. irrespective of the communication channel used, may it be already available technology to retrofit vehicle fleets being already in the field, state-of-the-art technology to roll out on vehicle fleets in production, or next generation technology for research. The second purpose of the limitation is to reduce time to standardization, as requirements for implementation sometimes differ significantly.

Message Encoding

SENSORIS job request, job status, and data messages are communicated between the three actor roles vehicle fleet, vehicle cloud, and service cloud. The SENSORIS messages have to be encoded for over-the-air and over-the-wire communication channels, i.e. they have to be serialized by the sender prior to communication and then have to be deserialized by the receiver.

Appendix 3

DATEX II Data format

Rationale

The signatories of the Proof-of-Concept MoU have agreed to use DATEX II to encode SRTI Level 3 data. They further agreed to use a common DATEX II profile, based on the SRTI *Recommended Reference Profile* which ensures compliance with the Commission Delegated Regulation (EU) 886/2013. This RRP is based on the common mapping table from DR886 to ITS standards, jointly developed by the DATEX II Program Support Action, TISA and the Amsterdam Group.

DATEX II model used

The profile is based on the DATEX II Situation package, which was downloaded from the http://www.datex2.eu website as a DATEX II pre-assembled package[1], containing the packages Common, LocationReferencing and Situation. The package contains also an empty Extension package, which has been filled by two DATEX II Level B extensions to extend the classes Linear and Point. The extensions provide one attribute respectively that takes up the corresponding location references – i.e. either a point or a linear – in OpenLR binary format. This format was preferred to the structured OpenLR encoding capabilities that exist in the LocationReferencing package.

Selection agreements

Based on this model, a selection was performed to define the common L3 profile. The selection was based on the SRTI RRP and no RRP-governed elements were de-selected.
The profile was created on the following principles, which had been agreed amongst the signatories:

1. *Additional values that allow adding further detailed information to the classes used in the SRTI mapping table:* It was agreed to keep these out of the PoC profile initially, unless we get concrete requirements for certain attributes to be included from PoC partners that want to provide the respective information details.
2. *Data elements to specify time validity aspects beyond overalStartTime and overallEndTime:* It was agreed that no further timing details are required/available for SRTI information.
3. *Optional classes to further detail the SiutationRecord base class of all SRTI events:* It was agreed that these classes are not suitable/relevant for SRTI information, if the L3 information is created out of L2 vehicle data. In case that partners fuse non-vehicle L2 or L3 data feeds into the L3 generation process, they should state concrete requirements if they need any of these data elements.
4. 4. *Location referencing:* The following agreements were made to tailor the location referencing options in the profile:
   a. Only point and linear locations are used (i.e. no area locations)
   b. Options based on EN ISO 19148 and TPEG location referencing are not selected
   c. ALERT-C location referencing is supported as an option for points and linears – in both cases only ALERT-C Method 4 (including offset distance from pre-defined location points) is used for SRTI; ALERT-C linears by AlertCLinearByCode is not selected
   d. OpenLR location referencing is supported as an option for points and linears, but not the structured model available in DATEX II, but the binary encoding provided by OpenLR – this encoding is introduced as a string via a Level B extension
   e. Co-ordinate based location references for points and linears (PointByCoordinates, GmlLineString) are used and made mandatory, to achieve interoperability with all clients. Note that the GmlLinearRing specialisation for GmlLineString is excluded, since it is used for area locations

Application

The profile is provided in a package with the following documents:
- SRTI L3 Profile Briefing Note 00-02-00.pdf: this document
- DATEX II PIM v3.0 with OpenLR binary 00-01-00.eap: the DATEX II pre-packaged Situation UML model including the OpenLR binary extensions

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[1] https://docs.datex2.eu/

- DATEX II PIM v3.0 with OpenLR binary 00-01-00.xml: the XMI export from the UML model above needed for the profile generation
- L3Profile 00-03-00.sel: the selection file that represents the data profile in the schema generation process (note that the version number may increase if additional requirements are added to the profile selection)
- safety_related_mapping_datex_denm_00-06-03.xlsx: the current working draft of the DR886 mapping table which is the basis for the current RRP as well as this profile

A folder named DATEXII_v3.0_L3_Profile with the following content: DATEXII_3_Common.xsd
DATEXII_3_D2Payload.xsd
DATEXII_3_Extension.xsd
DATEXII_3_LocationReferencing.xsd
DATEXII_3_Situation.xsd
-- all these are the schema files created for the different namespaces by the DATEX II schema generation tool[2] based on the profile data above
instance1 00-01-00.xml
-- an example file with a valid message instance for testing purposes

The following options of using the package are possible:

Implementation of the whole profile
If you want to implement the profile "as-is", you simply use the provided XML schemas (*.xsd files in the subfolder) for creating the serialisation functions of your interface, e.g. for data binding.

Creating a sub-schema
If your system does not handle all the data elements in this profile, you can create a tailored sub-schema for your system. This will reduce the implementation costs for clients that only want to connect to your data feed. Note that the DATEX II methodology and toolkit ensure that all valid SRTI instances against such a sub-schema are by definition also valid against the full profile schema, i.e. this step does not create interoperability problems.
In order to create a sub-schema, follow the following steps:
1. Put the package in a folder on your hard disk
2. Open the DATEX II schema creation wizard at https://webtool.datex2.eu/wizard
3. In Step 1 – Source: Go to the "Your own model" tab; then click on the Browse… button and select your XMI file ("DATEX II PIM v3.0 with OpenLR binary 00-01-00.xml") from your local folder; click on "Next"
4. In Step 2 – Selection file: Go to the "Your own selection" tab; then click on the Browse… button and select your .sel file ("L3Profile 00-02-00.sel") from your local folder; click on "Next"
5. In Step 3 – RRP Selection: Select the "SRTI RRP 2019 SRTI RRP" option
6. In Step 4 – Selection: Now go through the selection tree and de-select the elements that your system does not support; Note that the tool will warn you if you de-select elements governed by the DR, but that is OK if your system doesn't hold the content; Do not change the multiplicity of pointByCoordinates and gmlLineString, since we have agreed to make these mandatory IMPORTANT: do not add elements, a sub-schema can only remove (optional) elements in order to stay interoperable
7. In Step 5 – Options: select the "Save selection to file selection.sel" to make sure you have your modified selection available for future iterations; use this file in Step 2 instead of the selection file provided initially with the package
8. In Step 6 – Finish: save the ZIP with the schema files you have created and the corresponding selection file (see Step 5) on your hard disk and proceed with them towards interface implementation as described in the previous section.

Extending the schema, extending the model
If the model or the selection in the schema are not sufficient for your data feed, do not extend the model/selection yourself. Contact the Tech Group to discuss modifications, which would then be made available for all users of the package.

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[2] https://webtool.datex2.eu/wizard

Appendix 4

SRTI Ecosystem – Entrant information and self-declaration form

New entrants need to hand in a document containing information related to their (planned) role in the SRTI Ecosystem and available (or planned) data access interfaces. The SRTI ecosystem works best if the following technical requirements are met:

1. The data and the data access interface are thoroughly documented
2. The data access interface uses open standards exclusively
3. Metadata for the data access point is made available in the SRTI ecosystem's metadata repository (see chapter 5.3)

.

The following information needs to be provided by all new entrants:

- Organizational profile
- Declaration of what technical role(s) the applicant wishes to fulfill in the SRTI ecosystem together with a short description of planned activities in this context
  Some metadata of provided data or data access interfaces

The MPA mandates the use of a form to provide information and a self-declaration regarding the new entrants' role(s). The next two pages are a template to be used for this.

SRTI Ecosystem - Entrant information and self-declaration form

Form Version 05.10.2020

Organisational Profile

Party (organisation name)	*Name of legal entity*
Authorised signatory representing the Partner	*Name, position, e-mail address, postal address, phone number (optional)*
Contact person (project management, General Assembly representative)	*Name, position, e-mail address, postal address, phone number (optional)*
Contact person (technical working group representative)	*Name, position, e-mail address, postal address, phone number (optional)*
Motivation	*Rationale behind joining the SRTI Ecosystem*
Declaration of what technical role(s) the entrant wishes to fulfil	☐ Data Source of — ☐ L2 vehicle-generated data / ☐ L2 non-vehicle data / ☐ L3 data - vehicle-based / ☐ L3 data - non-vehicle-based ☐ L2 Data Access Interface Provider * ☐ Aggregator (L2 to L2') ☐ L2' Data Access Interface Provider * ☐ Creator (L3) ☐ L3 Data Access Interface Provider * ☐ Service Provider ☐ National Access Point * Note: A 'Data Access Interface Provider' is no Party to the Multi-Party Agreement and thus has no voting rights in the General Assembly.
Data interest	*What type(s) of data are you interested in receiving from the SRTI Ecosystem and for what reason?*
Timeline	*What is the rough timeline for data provision and system development related to SRTI data exchange?*

Data Provided

Name of dataset	*e.g. XYZ fleet L2 data*
Description of dataset	*e.g. This dataset contains vehicle/infrastructure generated L2 data using the following data fields / the following types: …*
Who collected or created the data?	☐ Our organization ☐ Another organization: *Organisation collecting/generating the data Company name, postal address, website, contact person*
Who is managing the data access interface for the data?	☐ Our organization ☐ Another organization: *Organisation collecting/generating the data Company name, postal address, website, contact person*
Data Level	*L2 data / L2' data / L3 data* *Further clarification if needed*
Description of measures taken to ensure that the data provided is not person identifiable	*e.g. no VIN included, no traces longer than x waypoints / y meters, non-retraceable Event-ID,……*
Start date of publication	*From what time was/will the data be available at the interface*
Area covered by publication	*The whole of Europe, World-wide, individual country, …*
Transportation mode(s)	*What type(s) of vehicles are the source of the data? Passenger vehicle, motorcycle, truck, …*
Data format - Encoding	*e.g. Binary*
Data format - Syntax	*e.g. Protocol buffers*
Data format - Data Model	*e.g. Sensoris*
Data format description	*e.g. The available data uses the Sensoris v1.2 profile for OEM L2 data / DATEX II L3 data. More information on this format can be found at http://...*
Access interface	*e.g. The data feed is accessed via a REST API at the endpoint https://... To be able to access the interface, authorization is needed. Contact XYZ for access.*
API documentation	*e.g. The API documentation can be found at https://...*
Additional information	*e.g. Latency expectation*

(add additional tables if more than one dataset / data access interface is provided)

If interested in applying to join the SRTI ecosystem, please extract the last 2 pages of the document for submission or use the separately provided entrants word document.

SRTI Ecosystem - Entrant information and self-declaration form
Form Version 05.10.2020

Organisational Profile

Party (organisation name)	*Name of legal entity*
Authorised signatory representing the Partner	*Name, position, e-mail address, postal address, phone number (optional)*
Contact person (project management, General Assembly representative)	*Name, position, e-mail address, postal address, phone number (optional)*
Contact person (technical working group representative)	*Name, position, e-mail address, postal address, phone number (optional)*
Motivation	*Rationale behind joining the SRTI Ecosystem*

Declaration of what technical role(s) the entrant wishes to fulfil	☐ Data Source of
	    ☐ L2 vehicle-generated data
	    ☐ L2 non-vehicle data
	    ☐ L3 data - vehicle-based
	    ☐ L3 data - non-vehicle-based
	
	☐ L2 Data Access Interface Provider *
	
	☐ Aggregator (L2 to L2')
	
	☐ L2' Data Access Interface Provider *
	
	☐ Creator (L3)
	
	☐ L3 Data Access Interface Provider *
	
	☐ Service Provider
	
	☐ National Access Point
	
	* Note: A 'Data Access Interface Provider' is no Party to the Multi-Party Agreement and thus has no voting rights in the General Assembly.

Data interest	*What type(s) of data are you interested in receiving from the SRTI Ecosystem and for what reason?*
Timeline	*What is the rough timeline for data provision and system development related to SRTI data exchange?*

Data Provided

Name of dataset	*e.g. XYZ fleet L2 data*
Description of dataset	*e.g. This dataset contains vehicle/infrastructure generated L2 data using the following data fields / the following types: …*
Who collected or created the data?	☐ Our organization ☐ Another organization: *Organisation collecting/generating the data* *Company name, postal address, website, contact person*
Who is managing the data access interface for the data?	☐ Our organization ☐ Another organization: *Organisation collecting/generating the data* *Company name, postal address, website, contact person*
Data Level	*L2 data / L2' data / L3 data* *Further clarification if needed*
Description of measures taken to ensure that the data provided is not person identifiable	*e.g. no VIN included, no traces longer than x waypoints / y meters, non-retraceable Event-ID,……*
Start date of publication	*From what time was/will the data be available at the interface*
Area covered by publication	*The whole of Europe, World-wide, individual country, …*
Transportation mode(s)	*What type(s) of vehicles are the source of the data? Passenger vehicle, motorcycle, truck, …*
Data format - Encoding	*e.g. Binary*
Data format - Syntax	*e.g. Protocol buffers*
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