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Challenge 6:
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Grant Agreement Number 248338

Logistics for Life Coordination Action

Logistics for Life

Logistics Industry Coalition **for**
Long-term, **I**CT-based **F**reight Transport **E**fficiency.

Deliverable D4.7

Sustainability Solutions Collection

Workpackage WP4
Forum and Supportive Actions

Leading Partner: Insiel

Security Restriction: Public

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Version 0.2

Versioning

Version	Description	Author	Date	Comments
0.1	First circulating version of updated Deliverable after the revision of March 2011.	Paola Lupieri (Insiel)	01/12/2011	The document has been modified on the basis of the suggestions and requirements made by the reviewers. The actions undertaken are listed in Annex I.
0.2	Second circulating version	Paola Lupieri (Insiel)	09/01/2012	Integration of new material from best practices results.

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1 Executive summary

Logistics for Life aims at bringing together different stakeholders dealing with innovative ICT solutions to ensure the long-term sustainability of the European logistics sector. The efficiency of logistic operations is of primary importance for the competitiveness of small and medium sized enterprises, the backbone of the European economy. Moreover, the logistics sector, particularly the freight transport, strongly contributes to the CO_2 and NO_X emissions. Consequently, a higher efficiency in the freight transport would support the industrial competitiveness and produce a positive impact on the environment. Given the relevance of transportation in the global economy and its pervasiveness in the Society, it is clear that beside the strictly environmental aspects, also the social and economic ones, thus sustainability as a whole, are strongly interested and impacted by transport logistics. Since the community has become aware of this relation, a number of initiatives have been promoted in the field of efficient and green logistics, both by local Organisms and by the European Commission, as evidenced by the Green Paper "Towards a new culture for urban mobility" (2007) dedicated to a sustainable transport across cities, and by the "Greening Transport Package" of initiatives (2008), regarding the cost and the polluting impact of road and rail freight transport. Several slots of work programmes have been dedicated to support, promote and fund research projects within the logistics area. Similar initiatives can be found also outside of the EU-funded programmes, both in companies (such as DHL and Dachser) and at the local or national level in European and EFTA countries (such as the Finnish TransECO program).

The plethora of research programmes and activities dedicated to improving the efficiency and greenness of freight transport processes has started releasing a multitude of results and technological solutions. The lack of a common glossary, the poor coordination and the large number of these solutions contribute to create a certain difficulty in identifying, given a concrete logistic problem, the best matching solution.

To counteract this effect, the Logistics for Life project is dedicated to rationalizing, coordinating and promoting the most promising ICT research activities and results for logistics. The main tool developed within the project for connecting organizations and stakeholders interested in ICT solutions for logistics is the Intelligent Cargo Forum. In particular, **WP 4 – Forum and Supportive Actions** aims at supporting the Forum community, promoting its membership and coordinating its activities, in order to contribute to the strategic roadmapping of the ICT solutions effective implementation.

The **Deliverable D4.7 - Sustainability Solutions Collection** collects material related to solutions impacting on environmental, economic and social sustainability of freight transport and suitable for divulgation and distribution at conferences, expositions and other relevant events of the Logistics for Life community. This Deliverable presents the criteria of selection and organization of the material in the various Collection channels, provides a uniform format for detailing the solutions matching the project objectives and contains links to document and presentations related to each identified solution.

1.1 Terms and conventions used in the document

The following acronyms and abbreviations are used in the present document:

Table 1 Acronyms and abbreviations used in the document

TERM	DEFINITION
AEO	Authorized Economic Operator
B2A	Business to Administration
B2B	Business to Business
CSD	Container Security Device

ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
FEA	Fuel Efficiency Advisor
GHG	Green House Gas
HGV	Heavy Goods Vehicles
IC	Intelligent Cargo
IC Forum	Intelligent Cargo Forum, available at: www.intelligentcargo.eu
IS	Information System
ITS	Intelligent Transport System
IWT	Inland Waterway Transport
L4L	Logistics for Life
LSP	Logistic Service Provider
OBU	On Board Unit
OGE	On Goods Equipment
SDI	Sustainable Development Indicators
SICIS	Shared Intermodal Container Information System
SotA	State of the Art
SSC	Sustainability Solutions Collection
TEU	Twenty-foot Equivalent Unit (often TEU or teu), cargo capacity of a standard intermodal container
V2I	Vehicle-to-Infrastructure
V2V	Vehicle-to-Vehicle
VAS	Value Added Services
WCM	World Container Model
WP	Work Package

2 Introduction

2.1 Objectives of Workpackage 4

Workpackage 4 has the following objectives:

• to support and extend the Intelligent Cargo Forum as a community of relevant organizations and stakeholders interested in ICT solutions for sustainable logistics;

• to ensure that the Forum reaches a proper dimension and representativeness, by constantly monitoring and promoting its membership;

• to plan, organize and monitor the Forum activities as an integral part of L4L, contributing to the project coordination and road-mapping objectives;

• to provide and administer the Collaboration Platform supporting cooperative work and information exchange among the project partners and the Forum members;

• to implement and maintain the Sustainability Solutions Collection, making it available to the other Workpackages for dissemination and knowledge acquisition purposes.

2.2 Results documented in the Deliverable 4.7

Within WP4, Task 4.4 aims at selecting and making available to the L4L community a demonstrable set of ICT solutions for sustainability in logistics.

The Deliverable D4.7 (Sustainability Solutions Collection) concludes the activity of the Task and collects the selected material regarding sustainable ICT solutions, to be used for dissemination at conferences, expositions and other relevant events for the L4L community. The Collection promotes a selection of solutions among the results released from EU, national and international research projects, and promoted as best practices in WP1. Suggestions and indications regarding the channels and content of the Collection, coming from the stakeholders and the project partners and collected through the L4L Forum and meetings are here integrated. Documentation, presentations, live demos, videos, brochures and other promotional material about the selected solutions are collected and linked on the Collaboration Platform.

Since many projects are still in their developing phases, the solutions described here and inserted in the Collection channels will be those currently available from the partner projects (i.e., the solutions coming from the best practices under observation are not treated here). For the same reason, the Collection will be updated in time, and a strategy for its maintenance will be described in this document.

Most importantly, the methodology followed for selecting the material, integrating it into the Collection and presenting it will be detailed in this document. In particular, a taxonomy will be introduced to explain how the selected ICT solutions contribute to an economically, environmentally, socially sustainable transport logistics, based on a set of sustainability indicators.

3 Methodological Approach

In order to efficiently transmit the impact that the solutions indicated in the best practices have in the field of economic, environmental and social sustainability, it is necessary to establish a strategy for the presentation of this content within the Sustainability Solutions Collection (SSC). This should include an accurate choice of the input material to be presented, the means and tools by which the SSC will take place and the criteria that should guide the layout of these tools. All these elements will be discussed in the sections of this chapter.

3.1 Input material

Among the first tasks of the L4L Workplan, there has been that to select research projects, of either European or national extension, as the best practices for logistics, i.e., the projects proposing the most relevant approaches and ICT solutions to improve the sustainability in the logistics sector. This task was specifically addressed within WP1 and concluded with the release of the Deliverable 1.2, collecting the L4L best practices and information regarding their innovative content. Therefore, the material and ideas constituting the SSC come as input from WP1 and in particular from the results listed in D1.2 ("Best practice cases") and are hosted in the Knowledge Base (D2.2). The IC Forum provides a channel to disseminate the results hosted in the Knowledge Base, as it is represents a channel of discussion related to the L4L Roadmap and its thematic forum.

The best practices are solutions with great potential of increasing the sustainability in the logistics sector. Here we take a further step forward and analyze, on the basis of the concrete objectives and attainments, the benefits coming from the application of these practices in the real world. The information related to the sustainability of every solution will be here collected and elaborated into a "demonstration kit". This material will be exploited in dissemination activities and will be a valid tool for analyzing the directions taken so far in the logistics research and development, and the roadmap for the future activities.

Since D1.2 is subject to future updates and additions, analogously the SSC will be enriched with new solutions and demonstration material, as soon as these are available.

3.2 Arrangement of the input material in the Sustainability Solutions Collection

Two criteria are adopted to present the selected best practices in the channels of the SSC, reflecting two different aspects that might be of interest for a final user that approaches the SSC.

The first is an "analytical", rational organization of the solutions following a taxonomy meant to explain and rationalize the impact of the solutions on sustainability, as explained in section 3.2.1. Here the solutions are classified on the basis of a set of indicators evaluating the impact of solutions on the environmental, economic and social sustainability. This criterion reflects the objectives of L4L, since it highlights how and to which extent every solution improves the sustainability of freight transport logistics.

The second criterion is the "synthetic", in-field organization of the selected practices according to a common scenario, detailed in section 3.2.2. This channel reflects the interest of a final user approaching the SSC to understand which functionalities the solutions provide within the Supply Chain. Here a plausible set of logistic problems is represented, and all the solutions that can help their resolutions are from time to time listed. This arrangement is key to immediately highlight overlaps and gaps formed by solutions and their concrete applications in a plausible scenario, by replying to the question: do any of the practice solutions actually remedy this accident? In case the answer is "None of them!" the problem highlighted by the scenario provides a hint for the possible directions of future research activities, to be integrated in the L4L Roadmap of D1.4.

3.2.1 The L4L objectives viewpoint

The first criterion for the organization of the best practice solutions to be included in the SSC follows the logic of the L4L objectives: room is given to the solutions that do or aim at improving the

economic, environmental and social sustainability of transport logistics processes. The basis for this criterion lays in a set of indicators that are required to be applicable both for evaluation and comparison of solutions, i.e.:

- **evaluate solutions' impact** on the social, economic, environmental sustainability
- possibly **quantify** (and compare) the impact from different solutions

3.2.1.1 Sustainability Indicators

A set of sustainability indicators have been derived from the SotA on reporting in sustainability and with the following criteria:

1. Targeting solutions, estimating their potential impact on sustainability
2. Be aligned with the challenges of the Roadmap (D1.4)
3. Be focused on transport logistics

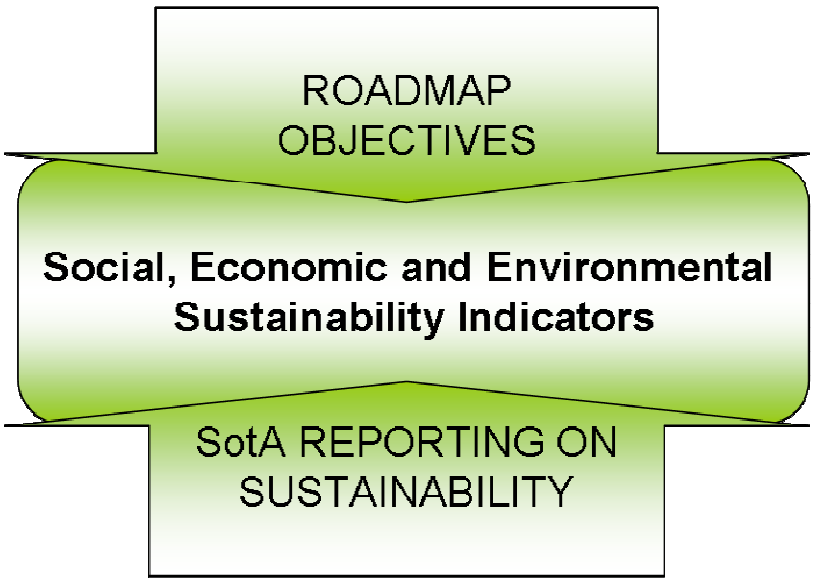

Figure 1 Sketch of the approach used to derive the sustainability indicators

As a first step, an extensive investigation of the existing indicator frameworks was undertaken. Both large scale initiatives and partners' focused research were taken into account:

- **EU and non-government initiatives**
  - Global Reporting Initiative (2006)
  - EC Sustainable Development Indicators (SDI) and Eurostat 2009 monitoring report of the EU sustainable development strategy
  - Eurostat Energy, transport and environment indicators pocketbook (2010)
- **partners' research results**
  - SKEMA Consolidation Study on Quality Criteria and Performance Indicators (2009)

These initiatives have different targets: some of them are designed to evaluate single enterprises working in the area of transport logistics, while others (in particular the EC SDI) are development-oriented and aim at analysing the trend of large communities (whole industrial and tertiary sectors of a country) in terms of impact on sustainability. As already mentioned, indicators are required in our case to evaluate the impact of project solutions, which implies that only the indicators that could be abstracted and define a concept that was neither company-focused nor community-focused are considered. For example: all sets of indicators contain the concept of GHG emissions; this concept is abstract and it is neither strictly connected to an enterprise (how much GHG is emitted yearly by that company?) nor to a community (how much GHG is emitted by the EU-25 because of the transport sector?), therefore it can be applied to our case as "how does the emission of GHG change with the adoption of the solution?". For the same reason, for example, an indicator evaluating the percentage of

females in the management level of a logistics enterprise or the number of trucks per citizen circulating in a territory, even though related to sustainability (respectively social and environmental) are not taken into account here.
Starting from this, we selected and adapted the available concepts and indicators among those in the state of the art reporting initiatives and we kept only those that fit the objectives and main stream of research provided by the Roadmap on ICT for Sustainable Freight Transport and Logistics.

Given that our target is measuring the effect of solutions on sustainability, it can be immediately seen that some indicators, despite being strictly related to sustainability in the transport logistic context, are more difficult to quantify and measure with respect to others, for example because they depend on several factors (e.g. the economic income) and evaluating them requires a long period of time (e.g. reduction of accidents). For this reason, the indicators are here proposed in two different groups: those that can be possibly measured within the activity of a research project and those that are very difficult to measure or not measurable at all (adhesion to policies) but that describe an expected, aimed at effect correlated with the adoption of a determined solution. The first group includes a number of indicators expressed whenever possible as measuring (estimating) a variation in a certain property while performing a transport logistics processes between the "TO BE" situation (solution in use) and the "AS IS" situation (no solution in use). When explicitly asking to express the answer in terms of variation due to the use of the solution, the following percentage of variation should be provided:

$$\text{Variation\_in\_X} = 100 \cdot \frac{(\text{TO\_BE\_X} - \text{AS\_IS\_X})}{\text{AS\_IS\_X}}\%$$

X being the quantity whose variation is to be evaluated, AS_IS_X being the quantity in absence of the solution delivered by a project and TO_BE_X the quantity when the solution is used. The expected answer from this kind of indicators is of course a numeric value quantifying the effect expressed by the indicator. Other indicators of this group will be expressed in terms of checklist detailing specific aspects of the effect the indicator is expressing (e.g., the "automation of processes" indicator in the list of economic sustainability indicators). This group of indicators will be referred to as "directly measurable".

The second group expresses the effects that are more difficult to measure for the reasons explained above. Answers to indicators of this group are expected to be Yes/No questions (e.g.: does the solution counteract the spill of hazardous material?). This second group will be referred to as "non-directly measurable".

The following paragraphs collect the obtained indicators, divided in the two groups: directly measurable and non-directly measurable. This separation will be kept also in the on-line channel of the SSC.

3.2.1.1.1 Environmental sustainability indicators

Directly measurable indicators

1. Reduction of energy consumption

Estimate the variation of energy consume in performing a service due to the use of the solution.

2. Reduction of GHG, ozone-depleting and POPs emissions

Estimate the variation in the emission/release of GHG, ozone-depleting and Stockholm POPs convention substances (CO2, CH4, NO, PFCs, HFCs ...) for a certain service due to the use of the solution. Specify separately the variation of emissions in urban areas.

For a full list of substances, consider the following links:

- GHG and ozone-depleting substances: http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter2.pdf and table at page 212 (IPCC and Montreal convention)
- POPs: http://chm.pops.int/Convention/ThePOPs/tabid/673/language/en-GB/Default.aspx#dnn_ctr2624_dnnTITLE_lblTitle (Stockholm convention)

Consider the following tools to calculate GHG emissions if needed:
http://www.ghgprotocol.org/calculation-tools

Non-directly measurable indicators

1. Promotion of green corridors and of modal shifts

Does the solution promote the use or development of green corridors? If yes, by which means? (more answers possible):

a. Supporting the use of railways
b. Supporting the use of (inland) waterborne transport
c. Supporting modal shifts

2. Reduction of spills of hazardous material

Does the solution counteract spills of chemicals, oils, fuels and hazardous material?

For a comprehensive list of hazardous material, consider the following link:

http://www.basel.int/text/17Jun2010-conv-e.pdf (Basel Convention, Annex VIII)

3. Support to the return and recycling of empties and to the efficient load factor

Can the solution be used for/support the return and recycling of empties of transport processes (e.g. empty containers, boxes, reusable pallets …) or to improve the cargo load factor? How?

4. Adhesion to local policies and initiatives related to the environmental sustainability

Does the solution apply to any policies, programmes or initiatives to:

a. promote green corridors?
b. use renewable energy sources and to increase energy efficiency?
c. manage the traffic congestion (e.g., promoting off-peak distribution, new inner city transport modes, and delivery by modes of alternative transportation)?
d. control urban air emissions in relation to road transport (e.g., use of alternative fuels, frequency of vehicle maintenance, driving styles, etc.)?
e. improve the environment friendliness of road transport, e.g. supporting the adoption of hybrid or electric vehicles, modal shifts, route planning?

For any matching option, please detail name and country of validity of the initiative.

3.2.1.1.2 Economic sustainability indicators

Directly measurable indicators

1. Reduction of cost, time, human, and material resources

Estimate the variation in resources required to deliver a certain service in terms of:

- material (breakdown per type of material, water included)
- cost (specifying all the data available: gross and net sales, payments made to providers, taxes/duties, ...)
- human work
- fuel
- time

2. Automation of processes

Indicate whether the use of the solution changes the degree of process automation in the following areas:

a. Payment system,
b. Alert system,
c. ETA calculation, update and communication system,
d. Fault detection system,
e. Weather information system,
f. Traffic information system,
g. Monitor of cargo status system,
h. Clearance processes,
i. Other (specify)

3. Improved information flow among stakeholders

If the solution is connected to the flow of information related to a transport service, estimate how good this flow is by indicating:

a. How frequently the information related to the ETA/status of freight is computed and updated during the transport process itself
b. Whether the algorithm of ETA prediction uses real-time traffic and weather information
c. Whether the freight conditions are monitored during the transport and this information is made available to all interested stakeholders (i.e., who started the transport, who makes the transport and who receives the freight)
d. Whether the solutions allows to automatically send information and alerts related to ETA and status of the transported freight predicted to all the interested stakeholders
e. Whether processes such as payments, freight identification, identification of custom clearance security controls needs, and similar, as well as the results of all these processes can be made automatic via the solution.

Non-directly measurable indicators

1. Improvement of economic income

Estimate whether and if possible how much the sales/earnings of a company/customer will improve by using the solution, taking into account all the sources of cost for which data are available: gross and net sales, payments made to providers, taxes/duties, ...

2. Improved anti-theft protection

Can the solution help fighting theft? If yes, how?

3. Adhesion to local policies and initiatives related to the economic sustainability

Does the solution apply to any subsidies, funding and financial facilities for companies and customers in order to favour its adoption? If yes, detail which facilities and where they apply, including funding for building infrastructures required by the solution.

3.2.1.1.3 Social sustainability indicators

Directly measurable indicators

1. Reduction of noise

Estimate the variation of noise in delivering a service due to the use of the solution.

Non-directly measurable indicators

1. Reduction of accidents

Can the solution reduce the number of injuries at work, road accidents and fatalities? If yes, indicate how this is foreseen.

2. Development of infrastructural elements

Does the solution require specific infrastructural elements that can be shared or used also by local communities? If yes, detail the elements and the geographic areas involved.

3. Adhesion to policy/initiatives related to the social sustainability

Does the solution apply to any policies, programmes or initiatives to:

a. Preserve the health and safety of whom uses it?
b. Manage the impact on communities in areas affected by activities, including monitoring systems?
c. Promote the management and abatement of noise in urban areas?
d. Determine working hours and rest hours, rest facilities, and leave for those driving and operating fleets?

For any matching option, please detail name and country of validity of the initiative.

3.2.2 The common scenario viewpoint

This criterion presents the best practice solutions through a map of problems solved thanks to their application. Here the solutions are accessed through the functions they supply, reflecting the connection of the SSC with the L4L framework (D2.2). A hypothetical scenario is created, by supposing that a specific logistic task or set of tasks is to be accomplished and by introducing a number of plausible contingencies that provoke delays and problems to their fulfilment. Every time a new task is to be accomplished or an instance diverts the expected flow of events, a best practice solution is proposed along with the effects of its application to the considered situation.

The common scenario called “Teddy bears on the road…”, introduced at the ECITL 2010 in Bremen, has been selected for this criterion. The story describes an imaginary transport process, involving a freight of teddy bears to be delivered from China to Belgium, and a number of hazards, deviations and problems hindering its safe arrival at destination. Indeed, during the journey the freight has to change transport mode, starting from a truck, and passing through ships and rails. The problems met during the journey are: bad weather conditions causing delays and re-planning of the route, loading/unloading mismatches and loss of cargo items. The following are the steps that describe the scenario:

0. Cargo ordered
1. Cargo loaded into container in the factory
2. Container sent from the factory to the port for shipping to destination
3. Weather troubles offshore: unscheduled stop in another port.
4. Cargo unloaded by mistake
5. Cargo loaded and shipped to destination
6. Cargo not unloaded by mistake in scheduled port: shipped to wrong destination
7. Cargo transferred with rail to final destination

In this channel of access to the SSC, the solutions are directly linked to specific steps of the transport process and to the hazards normally met and faced during its accomplishment. The solutions are selected on the basis of their applicability to this scenario, in order to cover the whole transport process with the best available possibilities. Sometimes more solutions can help solving the same problem, even though through different channels.

This way to access the portfolio of solutions is particularly suitable for graphical representation in printed documents and slides supported presentations. Moreover, it provides a generic landscape of logistic problems and by matching them with the best practices initiatives it is possible to immediately identify the regions that are covered by multiple solutions (overlap of best practices) and those that completely lack any resolving plan. The latter clearly mark the direction that, in a roadmapping vision of the logistics-oriented research, future projects should follow and the problems they should address.

3.3 Channels of the Sustainability Solutions Collection

The SSC will be exploited in workshops, exhibitions and events to provide a specific section dedicated to practices with sustainable and energy efficient solutions. In this section details are given about how the Collection will be presented to the public, through the following channels: dissemination material, booths, common sessions and the web site.

3.3.1 Dissemination material

The sustainable solutions and the projects delivering them will be listed in printed formats such as brochures and with slides-assisted presentations. This material will be available in all the events hosting the L4L project, as well as in the form of pdf documents on the web site of the project. This channel will first of all convey the image of an organic set of practices dedicated to energy efficient logistics.

The point of view of the L4L objectives will be mostly adopted here. Brochures and other small documents will shortly provide contact information with links and directions for the interested reader for further information (websites, contact emails, etc).

For presentations, both viewpoints will be adopted. The common scenario will be exploited, as it is particularly suitable for oral speeches, since it allows communicating the content of the Collection in the form of a story.

3.3.2 Booth

Booths hosting the L4L project will be hot spots for the distribution of dissemination material and will essentially hold two roles: first of all, they will demonstrate the existence of a coordination effort collecting the best practices for logistics, and in particular the sustainable solutions as a well defined part of them; moreover they will advertise the solutions themselves.

The representative members of the consortium at the L4L booth will be ready to give information about the solutions. It is highly desirable to have the booth of the L4L project hosting, or at least close to, the booths of some of the projects mentioned in the Collection, to convey a strong image of integration of efforts and activities.

3.3.3 Common sessions, quizzes and games

Due to the integrative and benchmarking nature of the L4L project, common sessions and games will be presented at events and conferences, where a sub-set of the collected solutions will be shown following the framework of the common scenario or through the evaluation of the sustainability impact provided by indicators. Games, quizzes and interactive sessions will be established with the aim to promote and disseminate the content of the SSC in an entertaining and interactive way.

The consortium has already provided a demonstration of the feasibility and of the success of such initiatives at the ECITL 2011 in Thessaloniki, Greece. There, the conference participants were invited

to take a quiz related to the objectives and results of the projects coordinating the conference and on the most important issues in sustainable transport. The quiz is currently available on the L4L website.

3.3.4 Web site

The IC Forum, available at http://www.intelligentcargo.eu/, will host a section dedicated to the SSC. Here, the objectives and the philosophy of the Collection will be described and information about the sustainable solutions will be collected. A number of subsections will collect the different contributions to the Collection. This channel will provide structured access to material and information collected in the Knowledge Base, through the viewpoints of the Collection.

The material distributed and projected in conferences and at events will be collected in the project websites and made available in a "Download" subsection of the SSC. News and links related to events about sustainable logistics will be also posted in a "News" subsection.

The data sheet of the solutions will be accessible from a dedicated subsection of the SSC, along with links to relevant material (demos, deliverables, presentations) related to the application of that solution and proving its effectiveness as sustainable practice.

A subsection of the Collection will describe the sustainability indicators and provide the links to every solution data sheet. Another subsection will instead present the common scenario point of view, using an initial picture like Figure 2, with links on every step of the freight route opening pages with explanations on how every solution can help.

3.4 Strategy for the Sustainability Solutions Collection Maintenance

The online channel of access to the Collection will be maintained by updating the material and information present in the corresponding areas of the Knowledge Base (that provides the content and database of the online SSC), when new material is available. All the other channels will be timely updated for presentation at events hosting the L4L booth.

3.4.1 Collection of new material

New material will be collected by checking, with a monthly frequency, for updates from the various projects nominated as best practices in WP1. The websites of the various projects and of the events that hosted them will be visited to verify the presence of new, relevant, public documents. New dissemination material from congresses and conferences will be collected after the conclusion of the event. The coordinators of the projects delivering the best practices will be personally contacted to ensure a direct channel for obtaining both informative and technical documents about the development of the practice.

3.4.2 Collection update

As soon as new material is available, its content will be evaluated and if proven to be interesting for the Collection objectives, it will be considered for integration in the various channels. Since the number of best practices is quite large, a systematic procedure for handling these updates is required. Briefly, it will work as follows:

1. News about solutions availability, start and conclusion of projects related to the collected solutions, as well as notices of events and registration deadlines will be inserted in the news subsection of the IC Forum as soon as they come out, along with links to the original web sites, when present.
2. When new solutions are released, the website and the documents available for download will be updated as required, new data sheet are created/modified etc. A message highlighting the

presence of fresh material will be added in the initial page of the Collection section of the IC Forum.

3. Presentations, brochures and movies will be updated with the latest news available or substituted with brand new ones in the occasion of new conferences or events involving the L4L project. After the conclusion of the event, this material will be collected and added on the IC Forum for vision or download. A repository of the most recent presentations, or of those who are judged more significant for conveying the motivation and the results reached within the project, will be kept in time as available material at the web site. The others will be gradually archived.

4 Best practices

In this chapter a list of the best practices elected in D1.2 is presented and for those with sufficient maturity (those that are not under observation) a brief overview of the solutions delivered is provided. In section 5, the solutions will be made accessible through the two viewpoints described in section 3.2.1 and 3.2.2, namely the impact on sustainability and the usability in a realistic transport scenario.

(Swedish) Cassandra and Port Pilot Gothenburg

The Swedish, nation-funded projects Cassandra and Port Pilot Gothenburg aimed at the realization of an architectural outline and prototype for a transportation IS supporting effectiveness and security. The projects were carried out in sequence and used the same ICT architecture, therefore they are described together in D1.2 as one "best practice". The projects delivered a demonstration prototype that included an advanced route and risk planning system. The route planning chooses the route based on cargo characteristics and statistics on day/night population, accidents and crimes. The focus of the project is on security, benefits on the environment are indirect.

- **Route and risk planning system**: the solution is a system for advanced route planning that chooses the routes based on cargo characteristics and statistics on day/night population, accidents and crimes. It is a service based solution offering a platform for data exchange between the different stakeholders, like the service providers, haulier, the port authority, the terminal as well as 3PL.

COMPLEX

The project COMPLEX starts from the need to implement a new system for processing customs declaration in Estonia, as a response to the European Union requirements on customs declarations in all member countries starting at latest from the 1st of January 2007. Transition to paper-free (electronic) customs clearance was one of the new requirements.

- **Integrated customs information system:** the COMPLEX solution is a web-based system, with the possibility to be used from every computer with Internet access. The Estonian Tax and Customs Board can on a day-to-day basis update and maintain the system so that users themselves do not have to do it. Customs declarations can also be drawn up and submitted in XML-format. A client can enter the e-Tax Board/e-Customs for using COMPLEX, via the Estonian Tax and Customs Board's web-page or via an Internet bank.

CVIS

The CVIS project aimed at creating cooperative systems based on V2V and V2I communications. Application of these systems is meant to improve the safety of road users, both in cities and in interurban routes, and the efficiency of road transport systems in general. The COMM technology allows traffic management systems to talk to individual vehicles, and specifically acknowledges the vehicles classes, giving priorities to emergency vehicles and to public or freight transport vehicles. CVIS has been pioneer for a number of later projects (such as SMARTFREIGHT) developing devices that exploit its open application framework (the FOAM technology), for inclusion in the vehicle and roadside equipment.

- **Continuous communication**: the CVIS platform offers continuous communication for applications based on the ISO CALM standards. CALM stands for Continuous Air-interface for Land Mobiles and manages available communication interfaces and automatically connects applications to the best interface. The handover between interfaces is fully transparent to the applications - all based on CVIS implementations of the latest standards. The communication interface to choose is based on network performance parameters like signal strength, application requirements and user specified parameters like cost.
- **Parking Booking**: this solution enables a vehicle to book a parking place before arriving at the destination. It can also take traffic conditions into consideration by suggesting new time slots for booking another area if the vehicle has low possibilities to arrive in time.

DiscWise (under observation)

The DiscWISE project is setting up three main pilots where the main objective is to show integration of small size companies into supply chains by means of the interfaces defined in the Common Framework. DiscWISE aims to improve the competitiveness of the transport and logistics sector through the smart use of ICT. The project seeks to improve the supply chain management, and to get the involved stakeholders more connected, in particular small size enterprises.

E-FREIGHT (under observation)

e-Freight will facilitate the use of different transport modes by means of ICT, in particular the Common Framework which will be extended to include also B2A and A2A communications. The e-Freight project is setting up several pilots that will show different use of the Common Framework.

EURIDICE (under observation)

The EURIDICE project introduces the idea of intelligent cargo to improve logistics performance and an intelligent cargo infrastructure that uses state of the art technologies and aims at more secure and environment friendly transport chains that support modal shift and door-to-door inter-modal services. The project has pilot implementations throughout Europe. Objectives of the project are: supporting the interaction of individual cargo items with the surrounding environment and users on the field; improving logistic performances through application of the intelligent cargo concept and technologies in the working practices of operators and industrial users; developing collaborative business models to sustain, promote and develop an intelligent cargo infrastructure; realizing more secure and environment friendly transport chains through the adoption of intelligent cargo to support modal shift and door-to-door inter-modal services.

EuroFOT

The euroFOT project is meant to field-test on a European scale a number of intelligent in-vehicle technologies. These include a Fuel Efficiency Advisor (FEA) as part of the Dynafleet transport IS, that provides the driver with real time information about location and driving conduct. The system helps the fuel-efficient driving through on-board functions for the driver and back-office follow-up reports.

- **Fuel efficiency advisor (FEA):** FEA monitors the fuel consume of drivers and is integrated with Dynafleet, a transport information system from Volvo Trucks, providing in real time the information from FEA as well as the current location of vehicles, messages, driver times, service intervals and more. Fuel-efficient driving, or eco-driving, is supported through on-board functions for the driver as well as follow-up reports in the back-office system Dynafleet Online.

FREILOT

FREILOT aims to increase energy efficiency in road goods transport in urban areas through a holistic treatment of traffic management, fleet management, the delivery vehicle and the driver. Target groups for the best practices are LSPs and logistic users. FREILOT uses state-of-the-art cooperative systems technologies for developing solutions that target environmental aspects like traffic signal prioritization and eco-driving.

- **Isolated control priority**: the aim of the solution is to optimise the traffic control system to reduce heavy vehicle fuel consumption. Optimising the traffic control aims to minimise congestion and vehicle stops at signal-controlled intersections and roundabouts. This is done through a local interaction between vehicles and traffic lights. Traffic lights coordinate and prioritize vehicles based on their weight and emergency: e.g. HGV are "soft" prioritized over private cars due to their weight and emergency vehicles are "hard" prioritized (immediate passing).

INTEGRITY

The INTEGRITY project aims at significant improvements of the reliability and predictability of global door-to-door container transports by optimizing the cooperation between transport industry and Customs Authorities in the China-EU trade corridor. The consolidation of data will significantly improve the transparency of the transport chain. At the same time the container security will be

significantly improved, for example by providing access to reliable sources of consignment information. This project has delivered and tested an IS (SICIS) allowing endorsed companies and authorities to access planning and status information of selected shipments. The platform combines available technologies and new business processes with legal and administrative agreements.

- **Shared Intermodal Container Information System (SICIS):** the solution aims at improving the visibility, reliability, and security of international intermodal door-to-door supply chains. This is achieved by collecting all relevant information from several sources such as the factory or consolidation centre where the container is stuffed, the operating systems of participating container terminals, tracking the vessel by its AIS (Automatic Identification System) transponder, and, as an option, CSDs (Container Security Devices) attached to the container. SICIS consolidates this information and grants access for relevant stakeholders based on a sophisticated system of access rights and under strict control of the owner of the respective trade lane. The best level of monitoring is reached if the containers are equipped with CSDs, which acquire the container position using GPS and transmit this information to SICIS via cellphone radio. In addition, the CSDs detect the container security status and raise an alarm if a container is opened without permission.

NS FRITS

North Sea Freight Intelligent Transport Solutions - NS FRITS is set to improve accessibility for the road freight sector in the seven countries of the North Sea Region by improving safety as well as efficiency and reducing the risk of accidents and security threats for drivers of HGVs

- **Road freight sector accessibility**: a system for live in-cab communications in a series of languages for drivers, transport managers and freight handlers. Information, suggestions and data reach the drivers in text, graphical and map formats, using mobile, GPRS and satellite technology. The objective is to improve the safety and efficiency of the road freight transportations in the North Sea Region and support the security of HGV drivers.

RISING (under observation)

The project has the overall objective of identifying, integrating and further developing information services such as River Information Services (RIS) in order to efficiently support IWT and logistics operations.

SAFESPOT

The objective of SAFESPOT is to understand how intelligent vehicles and intelligent roads can cooperate to produce a breakthrough for road safety. SAFESPOT uses the infrastructure and the vehicles as sources and destinations of safety-related information and develops an open, flexible and modular architecture and communication platform. It develops key enabling technologies: ad-hoc dynamic network, accurate relative localisation, dynamic local traffic maps. SAFESPOT has realised a V2V and V2I solution by utilizing the concept of Cooperative Systems, in close cooperation with CVIS and COOPERS.

- **Road safety**: the solution encompasses an in-vehicle platform (set up in the sub-project SAFEPROBE) providing safety-related information about the vehicle and its environment. Information gathered by roadside sensors is integrated with information from the vehicles themselves, considered in this context as ‘mobile sensors’ to enhance prevention in road safety through the use of infrastructures (set up in the sub-project INFRASENS).

Smart-CM

The project has integrated into a single window platform a number of technologies allowing logistics partners to identify, localize and have complete visibility on the security status of containers, independently on the container security device applied in the trade lane. Efficiency in logistics is here improved by focusing on the security issue of the transport chain management.

- **Smart-CM platform**: the SMART CM platform is an Interoperable Single Window platform solution, enabling all logistics actors and customs authorities to monitor the container security

status independently of the Container Security Device (CSD) technology applied in a trade lane. No bias is applied towards specific CSD technology providers, customs or businesses. Value added services (VAS) modules in SMART-CM solution build on the information and mapping layer to develop additional functionality of interest to the industrial partners, acquire and combine information from different data sources.

SMARTFREIGHT

The project focused on freight transport in urban areas and exploited the infrastructural elements developed within the CVIS project. On board support and control for freight vehicles is obtained via on-board equipment and wireless communication infrastructure, integrating traffic management systems with freight distribution systems. Specific objective realized during the project was testing the solutions in European cities. These solutions help reducing energy consumptions and emissions in the often polluted and crowded urban context.

- **Goods monitoring:** this solution is based on the application of On-Goods Equipment (OGE) attached to the cargo. The OGE includes temperature and shock sensors along with communication equipment so that both the driver and freight manager know the state of the cargo. Information about the cargo can also be used for traffic management purposes. Information is sent from the OGE to an On-Board Unit (OBU) based on the CVIS OBU hardware and software.
- **Traffic management of individual vehicles:** the generic access control developed in SMARTFREIGHT can be used to monitor and control vehicles and their cargo as they enter predefined controlled areas, or pass predefined locations. The traffic management can through the access policy specify that only vehicles with a special type of cargo (e.g. dangerous goods) should report at given locations or times. In addition, it can be coupled with dedicated roadside equipment (RSE), which interacts with the vehicles' OBUs about vehicle characteristics (e.g. loaded cargo), and consequently functions as a distributed traffic management. Combining these mechanisms, the traffic management is able to monitor and control vehicles and cargo throughout specified areas like a city area.

TransEco

This is a Finnish national research project, foreseeing a program on road transport energy savings and renewable energy that aims at developing and distributing technology for improved energy efficiency and reduced emissions in the road transport. The programme provides tools for adapting the Finnish road transport system in a cost-effective way to national and EU-level climate and energy targets: 10% of share for renewable energy in the road transport sector by 2020. The focus is on energy savings in transport, implementation of carbon neutral energy and increasing self-sufficiency in transport energy supply. Advanced bio fuels, technology for hybrid and electric vehicles and ICT solutions for road transport are among the themes covered.

- **Intelligent Heavy Vehicle:** the solution aims at improving vehicle efficiency and "green" navigation through ICT. The solution is based on an ITS tackling vehicle internal systems and information infrastructure. The vehicle internal systems contain areas like sensors, vehicle internal information traffic, drivers' information, guidance and evaluation diagnostics, optimization of maintenance, safety and driving processes based on different criteria, navigation, etc. The approach focuses on adaptive methods for load detection and slippery road detection, tested and applied in real cases for understanding and intelligent monitoring of both the environment and the features of the vehicles. Models on the relationships between vehicle features, driving habits and driving conditions are developed and evaluated in real driving tests. The systems are developed for transportation and could be used for transportation in any industrial sector and company size.

5 Structure and content of the Sustainability Solutions Collection

In the next sections, the solutions delivered by the best practice projects listed in section 4 will be presented via the two channels described in section 3.2: the L4L objectives viewpoint and the common scenario viewpoint. Only the solutions derived from best practices that are not under observation will be included in this description, because of the higher availability of their data.

The first approach collects solutions on the basis of their effect on sustainability, as described by the indicators listed in section 3.2.1.1. Indicators are when possible and based on publicly available information associated to a score quantifying the relevance of the impact. In the online version of the SSC, links connect this description to sheets, described in section 5.4, summarizing the solutions, their functions and supply chain associated processes, etc. As soon as new data and indicators answers are available, new values are inserted in this view.

The second approach, the Common Scenario, maps the best practices solutions into the landscape of a logistic route. By looking at how many solutions can assist every step of the route, and how or how efficiently they do that, it is possible to perform a gap analysis of the current research results applied to the scenario and sketch a roadmap for the future research and development activities dedicated to the transport. Also for this approach, in the online version of this SSC the solutions appearing here are linked to their description sheets.

5.1 The viewpoint of the L4L objectives

In this section, the solutions delivered by the best practices will be listed and differentiated according to the taxonomy of the L4L objectives, as explained in section 3.2.1. Numeric values expressing the impact of very solution are reported when publicly available. In the absence of such data, the impact is indicated as "not proven" and will keep this label until no information is found demonstrating its concreteness.

5.1.1 Impact on the environmental sustainability

The solutions listed here have a valuable impact on environmental sustainability. For every indicator, a brief description of how this is attained will be provided.

Directly measurable indicators

5.1.1.1 Reduction of energy consumption

- **Route and risk planning system** (delivered by Swedish Cassandra and Port Pilot Gothenburg): the solution is a system for advanced route planning based on cargo characteristics and statistics on day/night population, accidents and crimes. By improving the routing, truck drivers reduce the stops and improve the driving style (less accelerations and braking). Thus, the fuel/energy consumes and the emissions are reduced. *Not proven.*
- **Integrated customs IS** (delivered by COMPLEX): with COMPLEX it is not required to drive to customs office to present the documents, since these are transmitted electronically. This reduces driving distances and cuts down on congestion at borders, with a reduction of fuel consumption and emissions. *Not proven.*
- **Parking Booking** (delivered by CVIS): the opportunity to book a parking place (including loading and unloading areas) and to change the booking based on the traffic conditions avoids unnecessary driving and waiting, thus reducing the consumption of fuel. *Not proven.*
- **FEA** (delivered by euroFOT): FEA provides feedback to the driver in relation to his on road-driving style and thus promotes a fuel-efficient driving style. *Not proven*
- **Isolated control priority** (delivered by FREILOT): the solution aims at optimising the traffic control system and prioritizes HGV and emergency vehicles over private cars, thus avoiding their

stops and reducing their fuel consumption. Up to 20% reduction of fuel consumption in urban areas is attainable for heavy vehicles.

- **Road freight sector accessibility** (delivered by NS FRITS): the live in cab communication system provides suggestions to drivers encouraging better driving and avoiding extensive engine idling times, thus reducing the fuel/energy consumption. *Not proven.*
- **Road Safety** (delivered by SAFESPOT): technologies and mechanisms for increased road safety improve the traffic flow, thus reducing the fuel consumption of vehicles and their emissions. *Not proven.*
- **Smart-CM platform** (delivered by SMART CM): the main environmental benefit that can be obtained by adopting the SMART-CM platform is the reduction of 'wasted kilometres', i.e. kilometres travelled due to mistakes in communication (e.g. vessels-port-truck), which represent about 1% of total tonne kilometres travelled annually. This has effect on the energy/fuel consumption and emissions. Assuming:
    - 1000 TEU-kilometres saved;
    - Loading factor of 60% and total load of 11.2 tons per TEU;
    - 80% and 20% of distance travelled respectively on uncongested highway and congested conditions;
    - diesel (gasoline) combustion according to Euro V (Euro IV) norms

  This amounts to a reduction of 198 kg diesel and 129 kg gasoline.
- **Intelligent heavy vehicle** (delivered by TransEco): the solution provides optimized planning and control, allowing a reduction of fuel consumption, time and costs. *Not proven.*

5.1.1.2 Reduction of GHG, ozone-depleting and POPs emissions

- **Route and risk planning system** (delivered by Swedish Cassandra and Port Pilot Gothenburg): the solution is a system for advanced route planning based on cargo characteristics and statistics on day/night population, accidents and crimes. By improving the routing, truck drivers reduce the stops and improve the driving style (less accelerations and braking). Thus, the fuel/energy consumption and the emissions are reduced. *Not proven.*
- **Integrated customs information system** (delivered by COMPLEX): with COMPLEX it is not required to drive to customs office to present the documents, since these are transmitted electronically. This reduces driving distances and cuts down on congestion at borders, with a reduction of fuel consumption and emissions. *Not proven.*
- **FEA** (delivered by euroFOT): FEA provides feedback to the driver in relation to his on road-driving style and thus promotes a fuel-efficient driving style, which cuts down on the emissions. *Not proven.*
- **Isolated control priority** (delivered by FREILOT): the solution aims at optimising the traffic control system and prioritizes HGV and emergency vehicles over private cars, thus avoiding their stops and reducing their fuel consumption. In this way, emissions are reduced and congestions of heavy vehicles at crossroads are slimmed down. *Not proven.*
- **Road freight sector accessibility** (delivered by NS FRITS): the live in cab communication system provides suggestions to drivers encouraging better driving and avoiding extensive engine idling times, thus reducing the fuel/energy consumption. *Not proven.*
- **Road Safety** (delivered by SAFESPOT): technologies and mechanisms for increased road safety allow reducing accidents and improving the traffic flow, thus reducing the fuel consumption of vehicles and their emissions. *Not proven.*
- **Smart-CM platform** (delivered by SMART CM): the main environmental benefit that can be obtained by adopting the SMART-CM platform is the reduction of 'wasted kilometres', i.e. kilometres travelled due to mistakes in communication (e.g. vessels-port-truck), which represent about 1% of total tonne kilometres travelled annually. This has effect on the energy/fuel consumption and emissions. Assuming:
    - 1000 TEU-kilometres saved;

- Loading factor of 60% and total load of 11.2 tons per TEU;
- 80% and 20% of distance travelled respectively on uncongested highway and congested conditions;
- diesel (gasoline) combustion according to Euro V (Euro IV) norms

This amounts to a reduction of about: 20 (0) g SO_2, 806 (2860) g NO_x, 970 (20643) g CO, 415 (1795) g nm-VOC, 70 (205) g PM, 668 (374045) g CO_2, 19 (52) g CH_4 and 10 (6) g S for a diesel (gasoline) engine.

- **Traffic management of individual vehicles** (delivered by the best practice project SMARTFREIGHT): the solution allows an optimal management of traffic in urban areas by distributing the flow of freight vehicles through less congested routes. In this way, the time required for transportation is reduced, along with the fuel and emissions coming from long waiting in blocked queues. *Not proven.*
- **Intelligent heavy vehicle** (delivered by TransEco): the solution provides optimized planning and control, allowing a reduction of fuel consumption and consequently emissions. *Not proven.*

Non-directly measurable indicators

5.1.1.3 Promotion of green corridors and of modal shifts

- **Route and risk planning system** (delivered by Swedish Cassandra and Port Pilot Gothenburg): the solution provides a platform dedicated to road transport but integrated with infrastructures and terminals for information sharing. Port authorities are among the involved stakeholders.
- **SICIS** (delivered by INTEGRITY): SICIS was designed such that is can be used on any intermodal trade lane worldwide and by any size of supply chain organiser or logistics provider. The solution foresees the secure access to information related to containers and collected by different actors and devices: factories, the AIS of vessels, the CSDs. Data providers and users include: port and customs authorities, inland and terminal operators, cargo owners, 3PLs and shipping companies.
- **Smart-CM platform** (delivered by SMART CM): the platform is designed to be used in multimodal, cross-borders scenario, as a B2B and B2A application. Logistics actors can interface to the platform to safely and securely retrieve updated information related to containers: content, shippers, security status, position and ETA.

5.1.1.4 Reduction of spills of hazardous material

- **Road Safety** (delivered by SAFESPOT): the solution applies increased safety margins between vehicles, thus reducing the probability of accidents. This is much more important for vehicles transporting dangerous goods, in which case it reduces the probability of loss of transported material due to car bumping/accidents.

5.1.1.5 Adhesion to local policies and initiatives related to the environmental sustainability

a. promote green corridors
   - no solution

b. use renewable energy sources and to increase energy efficiency
   - **Intelligent heavy vehicle** (delivered by TransEco): the solution responds to the Finnish TransEco programme for increasing energy efficiency of on road transportation and reducing emissions and focuses on HGV. The work of TransEco is guided by a management group including a large participation from the Finnish government.

c. manage the traffic congestion (e.g., promoting off-peak distribution, new inner city transport modes, percentage of delivery by modes of alternative transportation)
   - no solution

d. control urban air emissions in relation to road transport (e.g., use of alternative fuels, frequency of vehicle maintenance, driving styles, etc.)

- no solution

e. improve the environment friendliness of road transport, e.g. supporting the adoption of hybrid or electric vehicles, modal shifts, route planning

- **Integrated customs IS** (delivered by COMPLEX): the solution responds to the EU requirements on customs declarations asking to apply paper-free (electronic) customs clearance ('Electronic Customs Decision' N° 70/2008/EC http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:023:0021:0026:EN:PDF).

5.1.2 Impact on Economic Sustainability

The solutions listed here have a valuable impact on economic sustainability. For every indicator, a brief description of how this is attained will be provided.

Directly measurable indicators

5.1.2.1 Reduction of cost, time, human, and material resources

- **Route and risk planning system** (delivered by Swedish Cassandra and Port Pilot Gothenburg): improved time efficiency due to faster access to facilities and reduced administration. Average gate time reduced from 10:11 (mm:ss) to 00:47, representing a reduction of transport time of 25% in the studied setup. Analysis and further tests indicate that the large-scale potential of the best practice is a 5,4% reduction of driver's working time based on driver days. By deleting the administration phase, the associated waiting time (approx. 1,8% (ibid)) can be eliminated.
- **Integrated customs IS** (delivered by COMPLEX): both the customs and traders can work much more efficiently and reduce the time and costs of the clearance operations: machine-to-machine and web based interfaces for lodging and amending of customs documents in electronic form allow saving on paper (cost and material); the automatic validation of data and instant feedback to traders about warnings, errors and possible loading restrictions to certain goods allows saving on time and human work. Fuel consumption is also reduced by cutting down driving distances. *Not proven.*
- **Parking Booking** (delivered by CVIS): this solution allows saving on time and human work to find an available parking spot or loading/unloading area. The booking can be changed based on the driver's probability to get there within the ETA and if a non authorised vehicle occupies the booked slot, the system alerts the local authority. By granting a loading/unloading area, shippers can save money from fees and penalties paid because of parking in non-authorized areas. Drivers performing test fields in the urban area of London reported saving in time of up to 45 minutes in delivering operations thanks to the use of this application. Moreover, the solution allows saving on costs due to parking fines that transport companies must pay because drivers are forced to park in non authorized areas to fulfil the delivery operations. These costs are highly variable as they depend on the company size, business and geographic area of activity. Drivers performing test fields in the urban area of London reported saving in costs from parking fines of £4.5k/month for a fleet of four vehicles.
- **FEA** (delivered by euroFOT): less fuel consumption leads to a reduction of the costs, as well as less use of natural resources. *Not proven.*
- **Isolated control priority** (delivered by FREILOT): up to 20% reduction of fuel consumption in urban areas is attainable for HGVs. Besides, HGVs and emergency vehicles are prioritized at signal-controlled intersections and roundabouts, which reduces their waiting time. *Not proven.*
- **SICIS** (delivered by INTEGRITY): reduction of human work and time is attained through an improved visibility of the supply chain. In particular, in a situation such as that of SME logistics providers, where up to 20% of the containers arrive in the destination port on another vessel than the scheduled and advised one, SICIS makes available reliable information about the vessel the container was loaded onto and about the actual ETA of the vessel, making the planning and the operations of the transport process efficient. *Not proven.*

- **Smart CM platform** (delivered by SMART CM): the use of the SMART CM system can bring to a transit time gain of containers at ports of at least one day and possibly reduce the dwell time variability, through an enhanced visibility of supply chain processes and improved customs clearance operations. This allows a reduction in costs, which is argued from theoretical models and can be quantified in terms of Value of Time (w), as the monetary value that cargo owner assumes for one day of transit time for goods with monetary value of one unit. w has $ / $ * day dimension and thus independent from the currency chosen. In other words, w shows what portion of value of goods in transit is attached to one day of transit. The calibrated WCM (World Container Model) uses the value of 0.0035. For instance, if a container holds cargo with a value of 100000 €, then w = 350 €/day.
- **Traffic management of individual vehicles** (delivered by SMARTFREIGHT): the solution allows an optimal management of traffic in urban areas by distributing the flow of freight vehicles through less congested routes. In this way, the time required for transportation is reduced, along with the fuel and emissions coming from long waiting in blocked queues. *Not proven.*
- **Intelligent heavy vehicle** (delivered by TransEco): the real-time interaction between vehicle internal events, environment and infrastructure increases the responsiveness to all kind of events and unforeseen impacts, which allows saving time. *Not proven.*

5.1.2.2 Automation of processes

- **Integrated customs IS** (delivered by COMPLEX): the solution makes the following processes automatic: automatic validation of arrival notifications and instant feedback to traders about warnings and errors; handling the arrival of the road transport without requiring the electronic arrival notification assigning the controls based on the results of risk analysis of the arrival and pre-arrival information; managing the status of consignments based on the results of controls quickly and efficiently; automatic validation of arrival notifications and instant feedback to traders about warnings and errors.
- **Continuous Communication** (delivered by CVIS): this solution provides V2I communication to on-road transporters, who can automatically be informed about relevant data related to traffic conditions and update the ETA accordingly.
- **Parking Booking** (delivered by CVIS): this solution allows automatically booking a parking area suitable for loading/unloading operations of on road transport. Moreover, by updating the ETA based on traffic conditions, it suggests alternative solutions in case the booking time were not suitable anymore.
- **SICIS** (delivered by INTEGRITY): the solution provides the automatic calculation and update of vessels' ETA, monitors the container status and triggers alerts in case of non-authorized opening.
- **Route and risk planning system** (delivered by the best practice project Swedish Cassandra and Port Pilot Gothenburg): the solution allows the following processes to be made automatic: monitoring of cargo status based on RFID, generation of proof of delivery/of collection.
- **Smart-CM platform** (delivered by SMART CM): the platform enables all logistics actors and customs authorities to monitor the container security status independently of the CSD technology applied in a trade lane. The VAS Suite provides an advanced mechanism to acquire and combine information from different data sources: based on the information regarding the current position of a container and its planned position, the ETA updates can be provided also using statistical data. The updates on ETA and ETD constitute the basis for alerting on deviations of time, location (defined by cases where a container is reported in areas/zones that a user –stakeholder- has defined as "restricted") or handling deviations (when a container was not handled correctly: e.g. it was unloaded in a wrong transhipment port, or has been staying within a terminal for a long period resulting in high demurrage costs).

5.1.2.3 Improved information flow among stakeholders

- **Route and risk planning system** (delivered by Swedish Cassandra and Port Pilot Gothenburg): the solution offers an information sharing platform and provides real time data and tracking and tracing of the cargo.
- **Integrated customs IS** (delivered by COMPLEX): the integration of data provided by different parties through the solution improves the quality and speed of the information flow related to the transported freight and its required security clearance controls: this helps customs officers to make decisions quickly and efficiently, through automatic and optionally manual risk-analysis of information and the assignment of controls by the customs authorities.
- **Continuous Communication** (delivered by CVIS): this solution provides V2I communication to on-road transporters, who can automatically be informed about relevant data related to traffic conditions and update the ETA accordingly.
- **FEA** (delivered by euroFOT): FEA is integrated with Dynafleet, an IS that provides in real time the current location of vehicles, their fuel consumption, messages, driver times, service intervals and much more.
- **SICIS** (delivered by INTEGRITY): SICIS provides all stakeholders through the web with real time information about the container status, vessel and position. Since the data come a large groups of actors and devices, the solution supplies customs authorities with reliable information about the containers consignor and consignee. SICIS allows authorised companies and authorities to access planning and status information of selected consignments. Furthermore, SICIS is prepared to interface with any data source (CSD provider, terminal system, port community system).
- **Road freight sector accessibility** (delivered by NS FRITS): the solution provides multi-language live in-cab communications to HGV drivers about conditions in a region or country they are about to enter. Terminal, container and port operators are involved as sources of information.
- **Road Safety** (delivered by SAFESPOT): real time information about the traffic and probability of accidents is provided to the driver through V2V and V2I communication.
- **Smart CM platform** (delivered by SMART CM): the use of a common communication platform enables better flow of information among logistics actors and customs authorities. The information can be retrieved through the Internet. In particular, security mechanisms are put in practice to treat the 'neutral information' provided by the CSD and required by the customs to monitor the security status of the container, to control the collection and distribution of information in a secured way.
- **Goods monitoring** (delivered by SMARTFREIGHT): real-time information about the goods (temperature, shocks) is available to the driver and freight manager and can be used for traffic management purposes. Information comes from sensors attached to on-goods equipment.
- **Traffic management of individual vehicles** (delivered by SMARTFREIGHT): through V2I communication, drivers are alerted when they are about to enter a restricted or controlled traffic area, and signalled whether, on the basis of the cargo they transport, they can access it.

Non-directly measurable indicators

5.1.2.4 Improvement of economic income

- **Route and risk planning system** (delivered by Swedish Cassandra and Port Pilot Gothenburg): the pilot undertaken in the project has shown significant reductions in the transportation time, which translates into an improvement of the quality of the service and thus of the competitiveness for the transport company on the market.
- **Integrated customs IS** (delivered by COMPLEX): the clearance procedures become more efficient, thus improving the quality of the service offered by freight forwarders and 3PLs.
- **Goods monitoring** (delivered by SMARTFREIGHT): by monitoring the temperature and the shocks of the cargo, the transporter provides an added value service to the customer, which translates into the possibility of higher economic income.

5.1.2.5 Improved anti-theft protection

- **Route and risk planning system** (delivered by Swedish Cassandra and Port Pilot Gothenburg): the time the trailers are idling is reduced to a minimum, virtually eliminating the risk of theft. Swedish custom declared their intentions of fully supporting an eventual future large-scale roll-out of the project, due to the improved decision and control abilities the solution enabled. Terminals are provided with RFID readers to allow automatic recognition of the trailers entering, so that only approved (verified) ones are allowed. This helps reducing smuggling.
- **SICIS** (delivered by INTEGRITY): SICIS monitors the container status and triggers alerts if the container seal is broken.
- **Road freight sector accessibility** (delivered by NS FRITS): the solution provides information about crime hotspots, secure parking locations and local policing practices, thus reducing the risk of security threats.
- **Smart CM platform** (delivered by SMART CM): the platform includes services for alerting on deviations of time, location (defined by cases where a container is reported in areas/zones that a stakeholder has defined as "restricted") or handling deviations (when a container was not handled correctly: e.g. it was unloaded in a wrong transhipment port, or has been staying within a terminal for a long period resulting in high demurrage costs). This can be used to track a container in case of theft.

5.1.2.6 Adhesion to local policies and initiatives related to the economic sustainability

- no solution

5.1.3 Impact on Social Sustainability

The solutions listed here have a valuable impact on social sustainability. For every indicator, a brief description of how this is attained will be provided.

Directly measurable indicators

5.1.3.1 Reduction of noise

- **Integrated customs IS** (delivered by COMPLEX): congestions on urban areas and thus noise will be reduced if border crossing operations are effective. *Not proven.*
- **Isolated control priority** (delivered by FREILOT): by reducing congestion at intersections and roundabouts, the solution helps reducing the noise due to the circulation of heavy vehicles and emergency vehicles in urban areas. *Not proven.*
- **Road freight sector accessibility** (delivered by NS FRITS): by providing updated information related to traffic conditions, the solution helps avoiding waiting queues and traffic congestion, thus reducing noise. *Not proven.*
- **Smart-CM platform** (delivered by SMART CM): the use of the Smart-CM platform can help reducing the noise through a reduction of the 'wasted kilometres', i.e. kilometres travelled due to mistakes in communication (e.g. vessels-port-truck), which represent about 1% of total tonne kilometres travelled annually. By assuming:
    - 1000 TEU-kilometres saved;
    - Loading factor of 60% and total load of 11.2 tons per TEU;
    - 80% and 20% of distance travelled respectively on uncongested highway and congested conditions;

  the reduction of noise, expressed in monetary terms, is estimated to be around 162 €.
- **Traffic management of individual vehicles** (delivered by SMARTFREIGHT): the solution allows an optimal management of traffic, reducing the congestion and thus the noise in urban areas and distribution the flow of freight vehicles across less congested routes. *Not proven.*

Non-directly measurable indicators

5.1.3.2 Reduction of accidents

- **Road freight sector accessibility** (delivered by NS FRITS): by highlighting poor weather conditions and signalling road accidents, traffic disruptions and local driving conditions, the solution allows bettering planning the route and reducing the probability of accidents. This is also important to prevent and reduce security threads for lone drivers.
- **Smart-CM platform** (delivered by SMART CM): the use of the Smart-CM platform can help reducing the on road accidents through a reduction of the 'wasted kilometres', i.e. kilometres travelled due to mistakes in communication (e.g. vessels-port-truck), which represent about 1% of total tonne kilometres travelled annually. By assuming:
    - 1000 TEU-kilometres saved;
    - Loading factor of 60% and total load of 11.2 tons per TEU;
    - 80% and 20% of distance travelled respectively on uncongested highway and congested conditions;

  the reduction of accidents, expressed in monetary terms, is estimated to be around 39 €.
- **Traffic Management of individual vehicles** (delivered by SMARTFREIGHT): monitoring and control of special kinds of cargo, i.e. dangerous goods, will improve road users' safety.
- **Road safety** (delivered by SAFESPOT): based on V2V communication, the solution allows an extension of the "safety margin", namely the time in which a potential accident is detected before it can occur, from the range of "milliseconds" up to "seconds". This extension, named "green area" reduces the risk of the accident to happen as more time is given to drivers to realize that there is a potential danger and to undertake the appropriate manoeuvres.

5.1.3.3 Development of infrastructural elements

- **Parking Booking** (delivered by CVIS): infrastructure is needed to the road equipment of the park area in order to recognize the vehicle for which the parked area is booked and allow the parking procedure.
- **Continuous communication** (delivered by CVIS): the solution incurs an ICT infrastructure deployed across the target area for the benefit of road users.
- **Isolated control priority** (delivered by FREILOT): the solution makes use of cooperative systems technology and requires that infrastructures at signal-controlled intersections and roundabouts are provided with antennas, RFID readers and devices communicating with others in vehicle.
- **Road safety** (delivered by SAFESPOT): the solution is based on V2V and V2I communication and requires antennas, RFID readers, and sensor networks to be applied at the infrastructural level to work.
- **Traffic management of individual vehicles** (delivered by SMARTFREIGHT): the solution requires specific devices in RSE communicating with OBU for V2I communication. The project was built over the V2I set up of the CVIS project.

5.1.3.4 Adhesion to policy/initiatives related to the social sustainability

Does the solution apply to any policies, programmes or initiatives to:

a. Preserve the health and safety of who uses it?

- **Route and risk planning system** (delivered by Swedish Cassandra and Port Pilot Gothenburg): the project is largely funded and developed by Swedish governmental entities, such as Vinnova and KBM. Every year several fatalities on truck parking lots can be avoided if drivers have their break in designated parking lots. The Cassandra solution reduces parking outside terminal areas and reduces the exposure of drivers to heavy traffic, potentially reducing fatalities.
- **Road freight sector accessibility** (delivered by NS FRITS): People United Against Crime association (http://www.people-united.org/) is among the project co-funders and developers. The association is a community safety and crime prevention charity that works throughout the Yorkshire and Humber region (UK).

b. Manage the impact on communities in areas affected by activities, including monitoring systems?

– no solution

c. Promote the management and abatement of noise in urban areas?

– no solution

d. Determine working hours and rest hours, rest facilities, and leave for those driving and operating fleets?

– no solution

5.2 The viewpoint of the Common Scenario

In Figure 2, the solutions delivered by the best practices are inserted in the Common Scenario, to highlight the steps they might support and help.

In the following paragraphs, every step will be considered and the support provided by the solutions indicated in the Figure will be detailed.

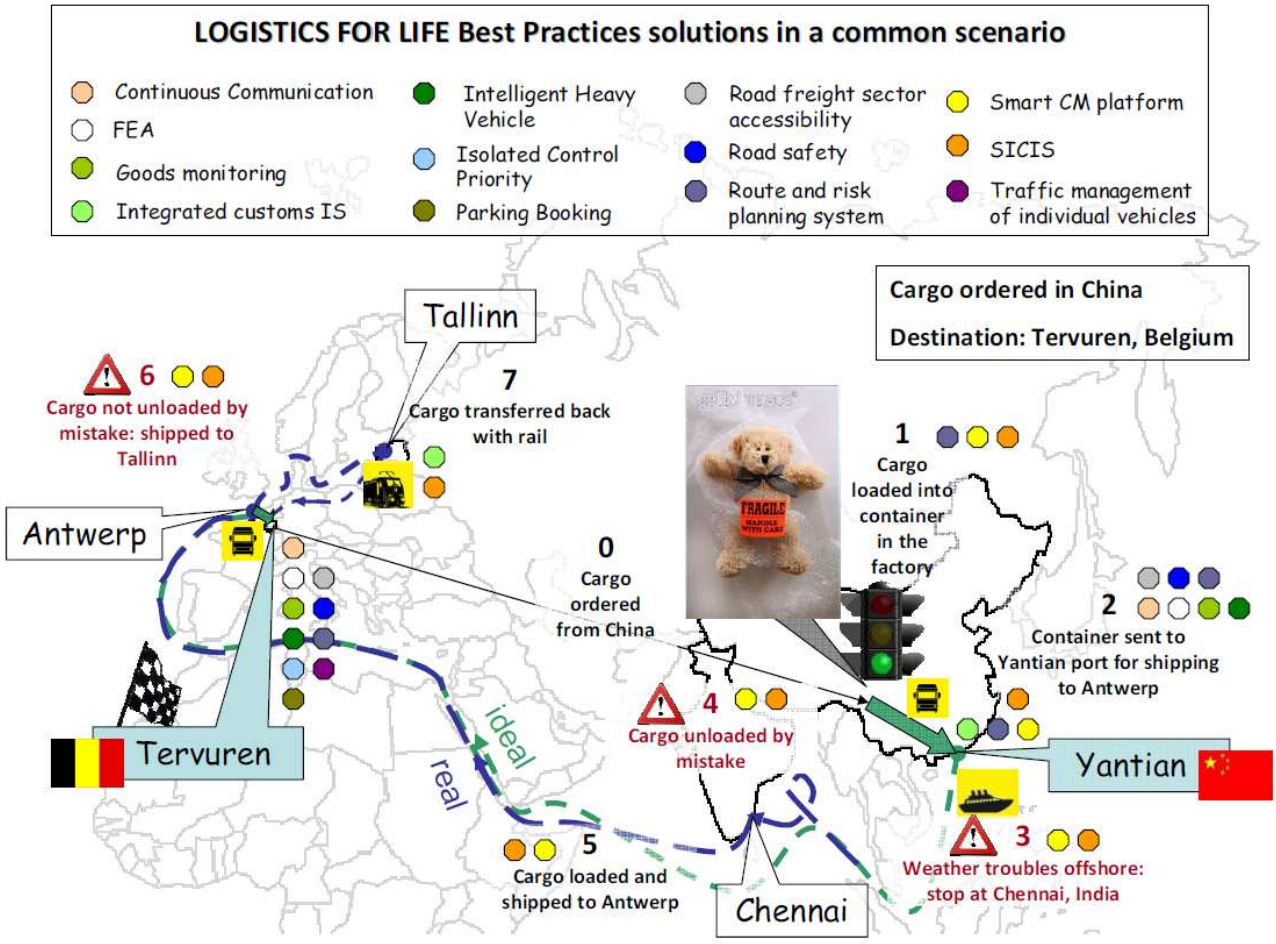

Figure 2 A summary slide of the common scenario approach

5.2.1 The Common Scenario route step by step

In this section, a brief description of every step of the common scenario depicted in Figure 2 will be presented. The channels and modalities of support provided by the mentioned best practices are detailed. This description will be enriched in the online version with connections to the functionalities

of the L4L framework (D2.2) that can be used in every step by every solution, as a result from the analysis undertaken in D1.2b.

Step 0 – Cargo ordered

A cargo of teddy bears is ordered for delivery from a city in the Chinese inland to Tervuren in Belgium.

Step 1 – Cargo loaded into container in the factory

The cargo is packed, arranged in a pallet and set ready for the journey.

The following practices can assist this step:

- Route and risk planning system: support in route planning, automatic recognition of cargo for early fault management and generation of proof of collection
- SICIS: the factory and the stakeholders stuffing the freight in the container are the first actor collecting and inserting information about the containerised freight in the SICIS system. This information will be afterwards available to all the authorised operators in the door-to-door transport chain.
- Smart-CM platform: the single window platform covers the containers flow in door-to-door chains starting from the point of stuffing (loading) and stripping (unloading), the container is then secured with seals and registered in the platform.

Step 2 – Container sent from the factory to the port for shipping to destination

A truck is charged with the freight container and sent to the Yantian port, where it will be unloaded from the truck and loaded into a ship sailing to Antwerp, Belgium.

The following practices can assist this step:

- Route and risk planning system: tracking and tracing services during the transport on the truck
- Continuous Communication: this solution provides support for efficient freight transport on the road via V2I communication. Drivers are thus informed and early alerted about traffic and weather conditions and can provide feedback.
- FEA: this solution helps drivers having a more fuel-saving driving style through on-board and back-office functionalities.
- Road freight sector accessibility: though the solution is implemented in the North Sea area, in principle it could be adopted also outside of the area, to support lone HGV drivers during their work. The solution provides the driver with information about traffic/weather conditions, and security hotspots in the region they are about to enter.
- Goods monitoring: the cargo conditions can be monitored during the transport. The driver and the transport manager can receive real time information about them.
- Road safety: through V2V and V2I communication the drivers are timely alerted in case of risk of accidents.
- Intelligent Heavy Vehicle: the solution promotes an eco-compatible transport.

Once at the port:

- Route and risk planning system: information system platform accessible to port authorities to retrieve information about the cargo; automatic generation of proof of delivery
- Integrated customs IS: the clearance procedures are fast, automatic and paper-free. The solution is currently implemented in Estonia.
- SICIS: the change of transport modality is supported by the IS that integrates information from and to a number of intermodal operators and actors. The container status, position and vessel can be monitored in real time through the web. Anti-theft protection is provided by the solution that triggers an alarm if the container seal is broken or opened by a non-authorized

person. Information about the container content, consignors and consignee is available and facilitates customs procedures.

- Smart-CM platform: when the container arrives at the port, the terminal operator already knows the required details to collect the container, load it into the right vessel within the expected time, through the solution. The single window platform supports the exchange of transport modality, integrating information from and to a number of logistics actors, with B2B and B2A functionalities. Port, terminals and customs authorities, AEOs, shippers, logistics and transport service providers can interface to the platform to securely retrieve updated information related to containers: content, shippers, security status, etc.

Step 3 – Weather troubles offshore: unscheduled stop in another port

During the journey, the ship meets bad weather conditions and for safety reason is compelled to stop at the port of Chennai, India.

The following practices can assist this step:

- Smart-CM platform: the platform provides deviation management services in case the container route is deviated from the planned one. The ETA and ETD can be recalculated and the container status can be monitored. The interested stakeholders can retrieve this information through the web.
- SICIS: CSDs attached to containers acquire their position using GPS and transmit this information to SICIS via cell phone radio, so that the container can be tracked and traced through the Internet.

Step 4 – Cargo unloaded by mistake

Instead of being left on the ship at the Chennai port, the cargo is unloaded and the ship sails again without it.

The following practices can assist this step:

- Smart-CM platform: the platform provides deviation management services in case the container is unloaded by mistake in a port, that was not included in the planned route. The ETA and ETD can be recalculated and the container status can be monitored. The interested stakeholders can retrieve this information through the web.
- SICIS: CSDs attached to containers acquire their position using GPS and transmit this information to SICIS via cell phone radio, so that the container can be tracked and traced through the Internet.

Step 5 – Cargo loaded and shipped to destination

The cargo is eventually loaded on another ship which sails to Antwerp, Belgium.

The following practices can assist this step:

- Smart-CM platform: the platform allows logistics actors to retrieve information about the status of the container, its position, ETA and ETD through the web.
- SICIS: CSDs attached to containers acquire their position using GPS and transmit this information to SICIS via cell phone radio, so that the container can be tracked and traced through the Internet.

Step 6 – Cargo not unloaded by mistake in scheduled port: shipped to wrong destination

Another mistake occurs, and the freight is not unloaded from the ship, which continues its journey to Tallinn, Estonia.

The following practices can assist this step:

- Smart-CM platform: the platform provides deviation management services in case the container is not unloaded by mistake. The ETA and ETD can be recalculated and the container status can be monitored. The interested stakeholders can retrieve this information through the web.

- SICIS: CSDs attached to containers acquire their position using GPS and transmit this information to SICIS via cell phone radio, so that the container can be tracked and traced through the Internet.

Step 7 – Cargo transferred with rail to final destination

In Tallinn the cargo is unloaded from the ship and loaded on a wagon, directed to Tervuren in Belgium. The following practices can assist this step:

- Integrated customs IS: the clearance procedures are fast, automatic and paper-free. The solution is currently implemented in Estonia.
- SICIS: the change of transport modality is supported by the IS that integrates information from and to a number of intermodal operators and actors. Information about the container content, consignors and consignee is available and facilitates customs procedures.

Once in Tervuren:

- Route and risk planning system: this solution allows planning the route and monitoring the cargo during transport for security issues.
- Continuous Communication: this solution provides support for efficient freight transport on the road via V2I communication. Drivers are thus informed and early alerted about traffic and weather conditions and can provide feedback.
- FEA: this solution helps drivers having a fuel-saving driving style through on-board and back-office functionalities.
- Isolated control priority: the solution prioritizes heavy vehicles at intersections in urban areas, thus promoting less fuel consumption in transportation and reduced congestions in cities.
- Road freight sector accessibility: though the solution is implemented in the North Sea area, in principle it could be adopted also outside of the area, to support lone HGV drivers during their work. The solution provides the driver with information about traffic/weather conditions, and security hotspots in the region they are about to enter.
- Parking Booking: by booking a suitable parking area close to the shop, the driver can be sure to find an area for unloading the freight and delivering it to the shop that ordered it.
- Goods monitoring: the cargo conditions can be monitored during the transport. The driver and the transport manager can receive real time information about them.
- Traffic management of individual vehicles: through V2I communication, the vehicle transporting the freight is routed through allowed (not restricted) traffic areas of the city and can avoid congested zones.
- Road safety: through V2V and V2I communication the drivers are timely alerted in case of risk of accidents.
- Intelligent Heavy Vehicle: the solution promotes an environment-friendly on road transport.

5.3 A Roadmap from the Common Scenario viewpoint

From the analysis of every step of the common scenario path and the solutions applying to that, a few considerations can be done:

- All solutions enter the scenario, even though some have geographic limitations in the current deployment, such as the NS FRITS delivered solution road freight sector accessibility (focused in the North Sea area) and the integrated customs IS from COMPLEX (currently active in Estonia only), since there are in principle no limits for their application outside of these areas.
- A few solutions focus on the management aspects of the logistic processes by monitoring in back office their accomplishment and providing real time visibility to the various steps of the chain (Smart-CM platform, SICIS by INTEGRITY). These solutions provide platforms for both business and authorities to access this information.

- Intermodality is supported by solutions dedicated to the management aspects of the logistics chain (SICIS by INTEGRITY and the Smart-CM platform). These offer the possibilities to change means of transport and smoothly transfer the required information and documents accompanying the freight, which are a major obstacle for fast deliveries.
- Most solutions focus on the road transport and some in particular on road transport in urban areas (FEA by euroFOT, continuous communication and parking booking by CVIS, isolated control priority by FREILOT, goods monitoring and traffic management of individual vehicles by SMARTFREIGHT, route and risk planning system by Cassandra, road freight sector accessibility by NS FRITS, road safety by SAFESPOT and intelligent heavy vehicle by TransEco). On the one side, this demonstrates the high exploitation of roads for freight transport, higher with respect to other means of transport; on the other side it denounces the need of higher efficiency and sustainability of road transport. None of the best practices solutions is specifically dedicated to freight transport across other waterways (apart from that delivered by the best practice RISING, currently under observation), rails or aircrafts. This is not surprising, given the little room for improvement in the energy efficiency of logistics processes performed with these means of transport, besides the strictly technical ones connected with the functioning of engines and fuel consumption.
- Mistaken loading/unloading processes can be discovered immediately by IC-like solutions, currently lacking in the set of solutions considered here. The best practice under observation EURIDICE has released an architectural framework for this purpose, however the maturity of the results is not yet sufficient to evaluate their impact on sustainability. If the cargo can alert the right actors of the logistic chain, the mistake can be repaired immediately.
- Besides the IC, the only solutions that can help repairing loading/unloading mistakes are systems offering satellite-based localization functionalities of the container and deviation management services, such as Smart-CM and SICIS. These however require the mistake to be first discovered, either by human or by automatic control.

It can be therefore concluded that:

- while many solutions focus on road transport, there are few projects delivering ICT solutions dedicated or even covering other transport modalities;
- situations that need to be tackled are in particular related to the fast discovery of mistaken loading/unloading processes and the quick repair of the mistake. ITS and in particular concepts such as the Intelligent Cargo can provide a solution to this problem;
- while there is the possibility to evaluate the sustainability impact of a certain transport process, or to choose a specific transport chain on the basis of its expected impact, this is by no means a rule. Future solutions for planning door-to-door transport chains should instead always consider this criterion, and analogously 3PL providers and vehicle accessories should always consider the control and benchmark of fuel/energy consumption and emissions, savings on human/temporal and economic resources along with safety and security issues as a standard service for customers.

5.4 Solutions description sheet

The solutions description sheet will provide a unified format for describing and visualizing every relevant ICT solution emerged from the best practices project researches. This format is consistent with the philosophy of the L4L objectives and with the structure of the Knowledge Base, whose database is made accessible on the IC Forum within the SSC. Solution description sheets will be filled for all the solutions in the SSC and will be made available through the IC Forum. As soon as new developments and information are available for the other projects, these will be updated through the Knowledge Base and appear in updated description sheets on the IC Forum.

The format is structured in order to summarize all the relevant information about each solution: its content, the project that delivers it, the technologies involved, the supply chain functionalities it fulfils (based on the L4L Framework of D2.2) and the main impact expected from its application. All entries of the sheet provide keys for characterizing and identifying the solution. The interested reader can

access more detailed information about the solution and its source project, by exploiting these keys, e.g. in browsing the L4L Knowledge Base or the Intelligent Cargo Forum.

The content of the sheet is as follows:

- Solution name and description
- Project name, contact reference to obtain more information on the solution (marketing purposes), date of delivery of the solution, market area (e.g. SMEs, port authorities, ...)
- Impact on environmental economic and social sustainability. This is described through the matching indicators and their results – where available -. Links to demonstration material explaining the impact will support the description. Material will include:
  - *Presentations*
  - *Videos/Demos*
  - *Publications* (project deliverables, white papers, brochures, press releases…)
- Technology used in the solutions: in this section the technological aspects of the solution and eventual requirements (e.g. operative system, specific devices, compliancy to specific standards) are listed.
- Relation to the supply chain: this section collects the areas of supply chain affected by the solution, the L4L framework functionalities it supports and the pilot activities where this was put in practice.

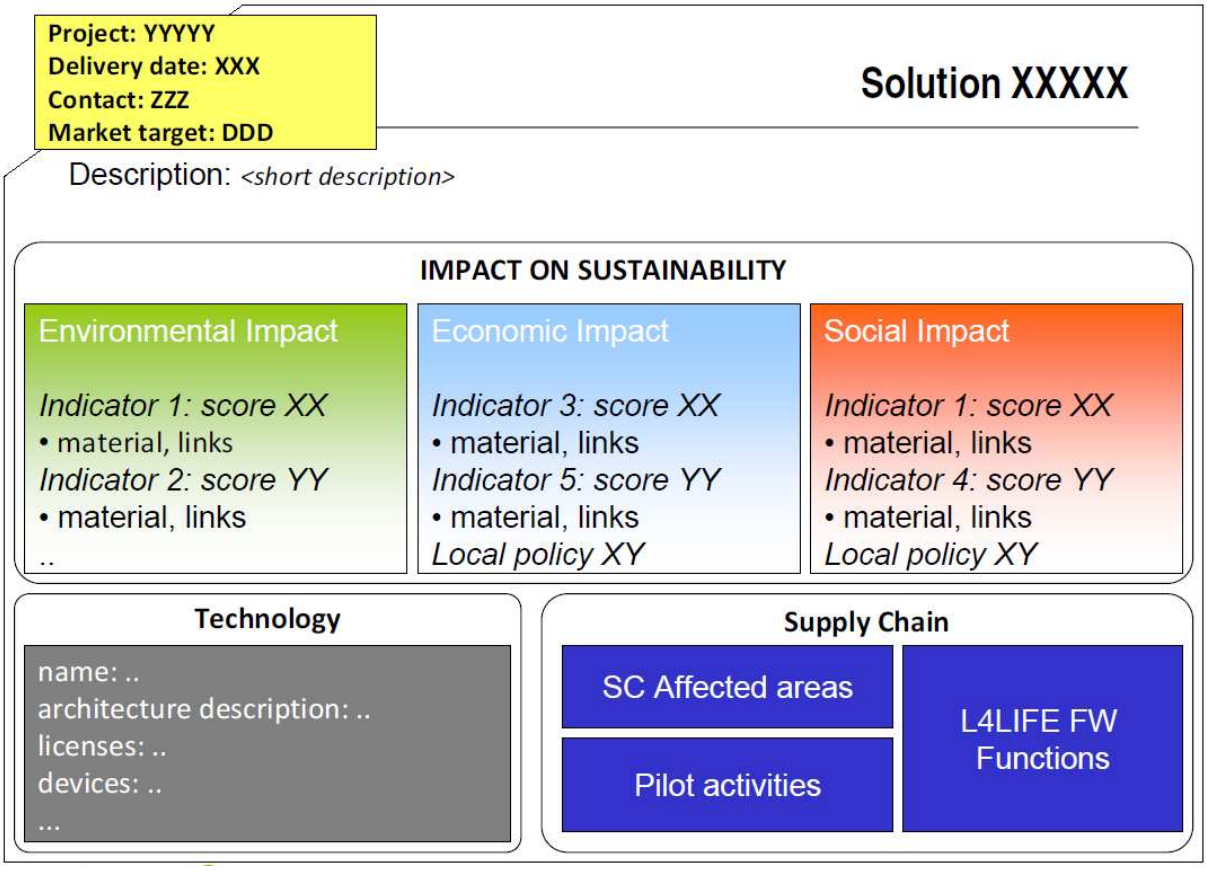

Figure 3 Scheme of the solution description sheet.

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7 Annex 1 – Answers to Reviewers' Recommendations

The following table collects the answers to the comments and recommendations from the first Review.

Table 2 Answers to the recommendations of the 1st Project review.

Reviewers' Comments	Action done
The term "Showcase" has been used here in rather an unorthodox context of "information source".	We have now changed the name of D4.7 into **Sustainability Solutions Collection**.
The showcased solutions are covering only the direct and indirect impacts on environment sustainability; societal and financial solutions are to be covered and included in the Deliverable, too.	We have now extended our approach covering **all three areas of sustainability**: **economic, environmental** and **social**. **Sustainability Indicators** have been introduced to evaluate the solutions impact the three sustainability dimensions.
Security restriction	The new version will be **publicly available** from the IC Forum and the L4L websites.
...not acceptable that this is based on complementary material to the stuff gathered for the database. This is simply unnecessary duplication of work and demonstrates lack of proper collaboration between the partners of the consortium.	The new version of D4.7 is **fed by the information collected in the Knowledge Base**. A **single DB** collecting all the gathered information has been set up and realized as collaboration **between WP1, WP2 and WP4** to properly take into account all the WPs requirements.