



"The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 723205"

Deliverable D6.9

Communication and dissemination plan (Final report)

Due date of deliverable: 30/04/2020

Actual submission date: 30/04/2020

Project details

Project acronym	SAFER-LC
Project full title	SAFER Level Crossing by integrating and optimizing road-rail infrastructure management and design
Grant Agreement no.	723205
Call ID and Topic	H2020-MG-2016-2017, Topic MG-3.4-2016
Project Timeframe	01/05/2017 – 30/04/2020
Duration	36 Months
Coordinator	UIC – Marie-Hélène Bonneau (bonneau@uic.org)

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Document details

Title	Communication and Dissemination plan (Final report)
Work package	WP6
Date of the document	30/04/2020
Version of the document	03
Responsible partner	UIC
Reviewing partner	all
Status of the document	Final
Dissemination level	Public

Document history:

Revision	Date	Description
01	14/04/2020	Update of D6.3 (Communication and dissemination plan)
02	27/04/2020	Final version with partner's updates
03	30/04/2020	Final version ready for submission

Consortium - List of partners

Partner No	Short name	Name	Country
1	UIC	International Union of Railways	France
2	VTT	VTT Technical Research Centre of Finland Ltd	Finland
3	NTNU	Norwegian University of Science and Technology	Norway
4	IFSTTAR	French institute of science and technology for transport, development and networks	France
5	FFE	Fundación Ferrocarriles Españoles	Spain
6	CERTH-HIT	Centre for Research and Technology Hellas - Hellenic Institute of Transport	Greece
7	TRAI NOSE	Trainose Transport – Passenger and Freight Transportation Services SA	Greece
8	INTADER	Intermodal Transportation and Logistics Research Association	Turkey
9	CEREMA	Centre for Studies and Expertise on Risks, Environment, Mobility, and Urban and Country planning	France
10	GLS	NeoGLS	France
11	RWTH	Rheinisch-Westfaelische Technische Hochschule Aachen University	Germany
12	UNIROMA3	University of Roma Tre	Italy
13	COMM	Commsignia Ltd	Hungary
14	IRU	International Road Transport Union - Projects ASBL	Belgium
15	SNCF	SNCF	France
16	DLR	German Aerospace Center	Germany
17	UTBM	University of Technology of Belfort-Montbéliard	France

Executive summary

SAFER-LC aims to improve safety and minimize risk by developing a fully-integrated cross-modal set of innovative solutions and tools for the proactive management and design of level-crossing infrastructure.

The project will deliver a bundle of recommended technical specifications (for standardisation), human processes and organizational and legal frameworks for implementation and will develop a toolbox accessible through a user-friendly interface which will integrate all the project results and solutions to help both rail and road managers to improve safety at level crossings

The widespread and effective dissemination of results is a key component of the project as well as one of the overall goals to be achieved.

The objectives of communication and dissemination activities, which contributed to the scientific and technical progress of the project as well as to broader implementation of the project results included

- generating interest for implementing project results by informing the target audience of the project and its objectives
- collecting inputs and feedbacks from stakeholders involved in level crossing safety and
- distributing appropriate information to each type of identified target audience so that each group can easily use and apply the information relevant for them.

The purpose of this document is to present the communication and dissemination actions in detail by listing the activities performed by the consortium partners during the development of the project.

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1. INTRODUCTION

1.1. Purpose of the document

SAFER-LC aimed to significantly enhance level crossing safety. Widespread and effective dissemination of results was a key component of the project and one of the overall goals.

The main objectives of the communication and dissemination activities can be summarised as follows:

- To develop means to maximise the dissemination potential of the project outputs;
- To identify the main target audiences and ensure the adequate promotion of the project, its activities and results to the each, and
- To develop, implement, test and evaluate the SAFER-LC toolbox containing all results.

The SAFER-LC communication and dissemination report included the following sections:

- Communication objectives
- Identification of target groups with potential interest in the project results
- Identification of the most suitable communication/dissemination channels for reaching the target audience
- Dissemination and communication tools

1.2. Definitions and acronyms

Short name	Name
CEDR	Conference of European Director of Road
CEN	European Committee for Standardization
ELCF	European Level Crossing Forum
ERA	European Railway Agency
ETSI	European Telecommunications Standards Institute
EU	European Union
GLXS	Global Level Crossing Symposium
ILCAD	International Level Crossing Awareness Day
IM	Infrastructure Manager
ISO	International Organization for Standardization
IRSC	International Railway Safety Council
LC	Level Crossing
ONISR	Observatoire National Interministériel de Sécurité routière (France)
TCDD	Turkish Railways
US DOT - FRA	United States Department of Transportation - Federal Railroad Administration
WCTR	World Conference on Transport Research
WP	Work Package

2. COMMUNICATION OBJECTIVES

This section identifies the project activities and outputs, as part of the various work packages (WPs), that are relevant to for dissemination.

2.1. Project Target groups

A fundamental aspect of an effective dissemination strategy is the definition of the target groups to whom the dissemination/communication activities must be tailored.

The SAFER-LC consortium identified the main stakeholders and classified them according to seven categories:

- Advisory Board
- Rail and road infrastructure managers and operators
- Manufacturers for level crossing safety systems
- Cooperative intelligent transportations systems (C-ITS) providers
- Scientific community
- Standardization bodies
- Policy makers
- Public

2.1.1. Advisory Board

The SAFER-LC Advisory Board brought together safety and security experts from the rail sector, rail industry, research centre and national authorities.

The main task of the Advisory Board was to advise the SAFER-LC project consortium, review and provide feedback regarding project progress, reflected mainly in the deliverables, in order to ensure their relevance and excellence.

The advisory board is composed of representatives from the following organisations:

- European Rail and road infrastructure managers:
 - ADIF (Spain),
 - INFRABEL (Belgium),
 - NETWORK RAIL (UK),
 - NOR Ban (Norway),
 - Trafikverket (Sweden)
 - CEDR (Conference of European Directors of roads)
 - UTP (Union des transports publics et ferroviaires)
- Authorities/policy makers
 - Spanish Railway Safety Authority (AESF)

- Spanish Ministerial Department for Roads (DGT)
 - RSI - Road Safety institution in Greece
 - DIGIFEMA (Directorate General for Railway and Maritime Investigation in Italy)
 - ONISR (The French Road Safety Observatory)
 - US DOT - FRA (The Federal Railroad Administration)
- Standardisation
 - ESF-GmbH (ISO, ETSI, CEN expert for standardisation)
 - Universities
 - Technical University of Madrid (UPM)
 - Level crossing experts
 - Global Level Crossing Services

2.1.2. Rail and road infrastructure managers and operators

As the aim of SAFER-LC was to provide innovative solutions that enhance safety at level crossings, rail and road infrastructure managers and rail operators were naturally the primary dissemination targets for project results. Therefore, it was crucial to dedicate specific dissemination and communication activities to members of these groups.

In the consortium:

- UIC, SNCF for France, TRAINOSE for Greece, Intader for Turkey

In the advisory board:

- ADIF (Spain),
- INFRABEL (Belgium),
- NETWORK RAIL (UK),
- NOR Ban (Norway),
- Trafikverket (Sweden)
- CEDR (Conference of European Directors of roads)
- UTP (Union des transports publics et ferroviaires)

Outside the consortium:

- **UIC network:** With 200 members globally representing rail infrastructure managers, rail operators and other public transport providers, the UIC network represents a technical platform within the rail sector. The network is very useful for disseminating the project results and collecting inputs for the development of requirements that should be satisfied by LCs. The rail system forum, the safety platform and the security platform are the main bodies that will be addressed.

- **IRU network:** IRU can draw on its network of 175 members. IRU is the voice of more than 3.5 million companies operating mobility and logistics services in over 100 countries gathering national associations of bus, coach, taxi and truck operators. IRU members will be asked to deliver inputs for the project pilots and to cooperate in the dissemination activities.
- **CEDR members:** The Road Directors' platform for cooperation and promotion of improvements to the road system and its infrastructure will provide support and advice on decisions concerning the safety procedures taken at national or international level.
- **Operation Livesaver:** is an international, non-profit education and awareness program dedicated to ending tragic collisions, fatalities and injuries at highway-rail grade crossings and on railroad rights of way. To accomplish its mission, Operation Livesaver promotes 3 Es: Engineering, Enforcement and Education.
- **FFE's network:** The board of trustees of the Spanish Railways Foundation is composed by main Spanish rail operators and administrator managers at national and regional level. Furthermore, FFE performs the technical secretariat of the Spanish Railways Technological Platform, that counts with 17 Spanish rail operators and infrastructure managers among its members.

2.1.3. Cooperative intelligent transportations systems (C-ITS) providers

In the consortium:

- Commsignia, Geoloc system

Outside the consortium:

- UNIFE members

2.1.4. Scientific community

In the consortium

- VTT, NTNU, IFSTTAR, FFE, CERTH-HIT, CEREMA, RWTH, UNIROMA3, DLR, UTBM

Outside the consortium:

- **FFE's network:** FFE performs duties of the technical Secretariat of the Spanish Railways Technological Platform, consisting of 451 members belonging to the Spanish rail R&D community, 38 of which are research groups of universities and 49 research and technology centres.
- **SIDT (Italian Academic Society of Transportation):** is a national and cultural institution with the aim of promoting and developing research in the field of transport as well as establishing contacts and exchanging information with other national and international societies as WCTR.

2.1.5. Standardisation bodies

ETSI TC ITS (European Telecommunications Standards Institute technical committee on ITS), C2C-CC (Car to Car Communication Consortium is a non-profit industry forum driven by the Automobile manufacturers); ISO TC204 WG16 (ISO Technical committee on ITS working group on communication) and CEN were the main targeted standardisation bodies.

2.1.6. Policy makers

- National authorities: They were addressed by members of the consortium at the national level
- ANSF (National Agency for Railway Safety): Defines the legislative framework for the operational and technical aspects of railways, manages the authorisation process for the utilization of railway subsystems and issues safety certificates enabling operations for railway companies and authorisations for infrastructure managers.
- European Commission: DGMOVE (Directorate General for Mobility and Transport), ERA (European Union Agency for Railways)
- International level: ITF (International transport Forum), UNECE (United Nations Economic Commission for Europe), SEETO (South-east Europe Transport Observatory)

2.1.7. Public: LC users

Rail Passengers, motorised road users, pedestrians, cyclists, persons with mobility restrictions, AIPSS (Italian Association of road Safety Professional) etc.

2.1.8. Related EU projects

Interfaces with related EU projects were identified and developed with the objective of creating synergies and avoiding duplicating work. Exchanges were initiated with the other projects of MG3.4 and common workshops were organised.

2.2. Project Target Group needs

Table 1 summarises the needs of each target group and the means of communication available to fulfil the needs

Table 1 – Project Target Group needs

Target group	Identified needs	Means of communication
Advisory Board	Share knowledge Give feedbacks/inputs	Promotional material SAFER-LC workspace Organisation of Workshops Participation of the experts in SAFER-LC WP's or progress meetings
Rail and road infrastructure managers and operators	Be informed on SAFER-LC progress Provide feedback/inputs Understand and use project outcomes to implement most adapted measures Evaluate the SAFER-LC Toolbox	Promotional material SAFER-LC workspace Presentations at UIC and IRU meetings and related events Organisation of events, workshops and training sessions Publication of leaflets with the project recommendations Training and workshop on the SAFER-LC Toolbox Addition of SAFER-LC website link to IM's own website, overview and sharing of the project results with some photos in their websites Monthly newsletters disseminated by the partners (e.g. UIC, IRU) with main project results, events organised etc.
Cooperative intelligent transportations systems (C-ITS) providers	Share and exchange knowledge Provide feedback/inputs	Promotional material Presentations at project meetings and related events Organisation of events, workshops and training sessions Publication of leaflets with the project recommendations
Standardisation bodies	Be informed on SAFER-LC progress and especially recommendations that could become standards	Promotional material Publication of leaflets with the project recommendations Establish contacts with the relevant groups
Policy makers	Use the project's outcomes: adapt the legal framework if needed	Promotional material Presentations at thematic events, workshops and exhibitions
Scientific community	Exchange of knowledge	Promotional material Presentations at scientific thematic events, workshops, conferences publication in scientific journals Social network
General public: LC users	Raise overall awareness on the project and its objectives	Promotional material Press releases Social networks Education: for example, open summer schools with presentation of SAFER-LC results to the Railway engineering students

2.3. Message and results to be disseminated

Table 2 below summarizes the relevant and significant outputs necessary for dissemination. The messages were extracted from each WP and were matched with relevant target groups for dissemination.

Table 2 – Key Message to be communicated to Project Target Groups

WP	Key Message to Communicate	Project Target Groups						
		Experts of the advisory Board	Safety managers from rail and road infrastructure managers and operators	Cooperative intelligent transportation systems (C-ITS) providers	Standardisation bodies	Policy maker	Scientific community	General public: LC users
WP1	Needs and requirements for improving LC safety	X	X	X	X	X	X	X
WP2	Low cost measures identified and evaluated	X	X	X	X	X	X	
WP3	Report on the solutions developed	X	X	X	X	X	X	
WP4	Early results from simulations available	X	X				X	
	Field implementation ready	X	X	X	X	X	X	X
	Results available	X	X	X	X	X	X	X
WP5	Proposal of standards	X	X	X	X	X	X	X
	Business models	X	X	X	X	X	X	X
	Recommendations	X	X	X	X	X	X	X

3. DISSEMINATION AND COMMUNICATION TOOLS

3.1. SAFER-LC Website

UIC created a dedicated website at www.safer-lc.eu at the very beginning of the project. The website gives the visitor a comprehensive overview of the project (Figure 1)

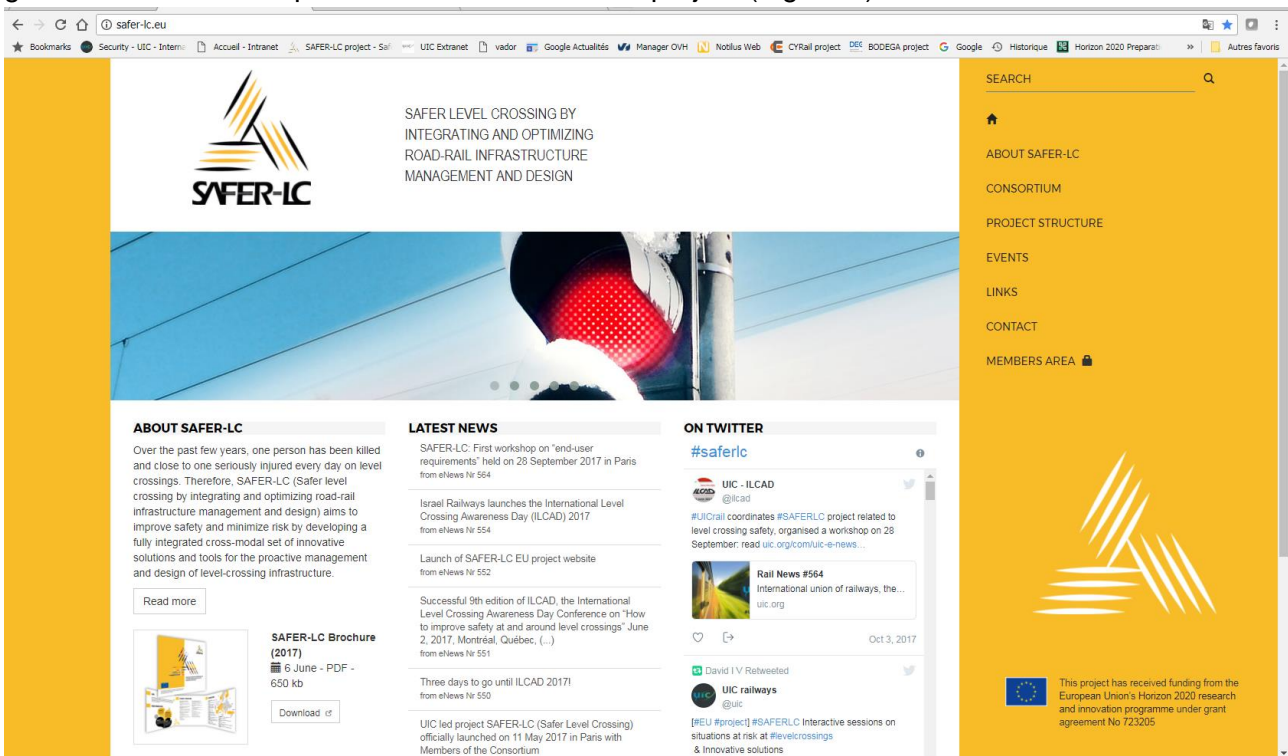


Figure 1– SAFER-LC Website – Home page

The SAFER-LC website was regularly updated and maintained to communicate project developments. All news is published on the web page as well as public outcomes, and tweets are regularly published with the hashtag #SAFERLC and through the twitter account @SAFERLC.

The consortium partners also referred to the SAFER-LC website within their company websites.

The website will remain online after the end of the project and will be maintained by UIC.

3.2. SAFER-LC Private Area

The main objective of the SAFER-LC private area, “SAFER-LC workspace” or “extranet”, was to facilitate communication and exchange knowledge among the consortium members, the members of the advisory board and the end-users.

The “SAFER-LC workspace” was created in the UIC collaborative Tool “OVIDENTIA”, which was an open source content management and collaboration platform based on a large community of users.

This SAFER-LC Workspace enabled users:

- to share and stock documents,
- to organise meetings
- to manage directories and contacts
- to discuss special issues online

The key functions of this exchange platform were the following:

- manage users’ rights and profiles
- manage meeting schedules and associated documents
- enable users with relevant rights to update information, upload and download files in real time
- manage the directories constituting a contacts database inside and outside the project
- provide e-mail notification of news and events
- search on the various fields

The SAFER-LC workspace is accessible at <https://extranet.uic.org/>. Screenshots of extranet pages are presented in Figure 2 and **Erreur ! Source du renvoi introuvable.**

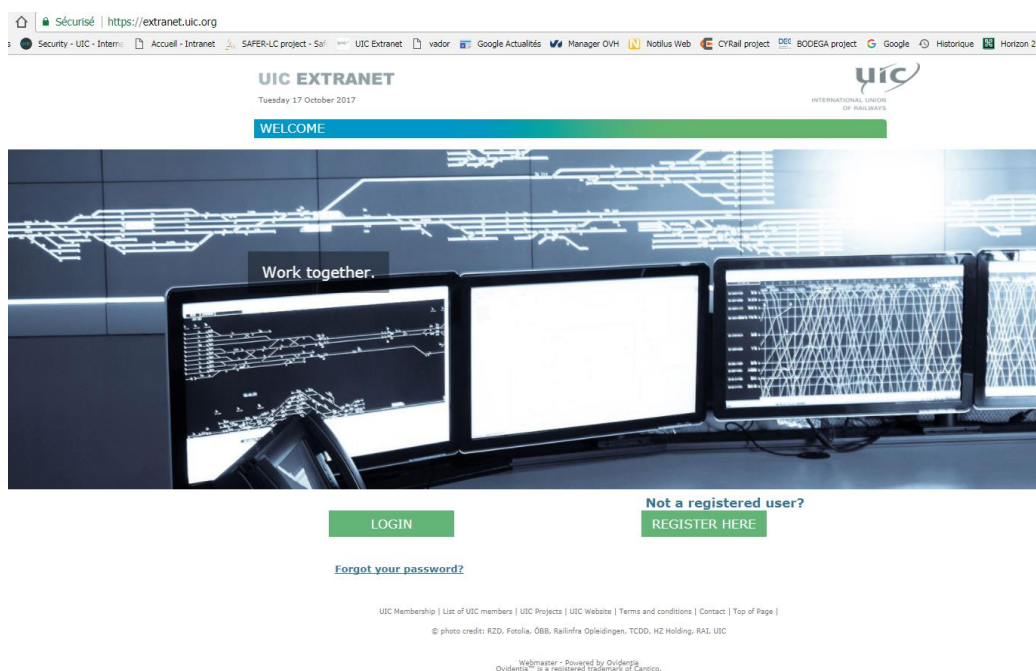


Figure 2 – SAFER-LC private area – welcome page

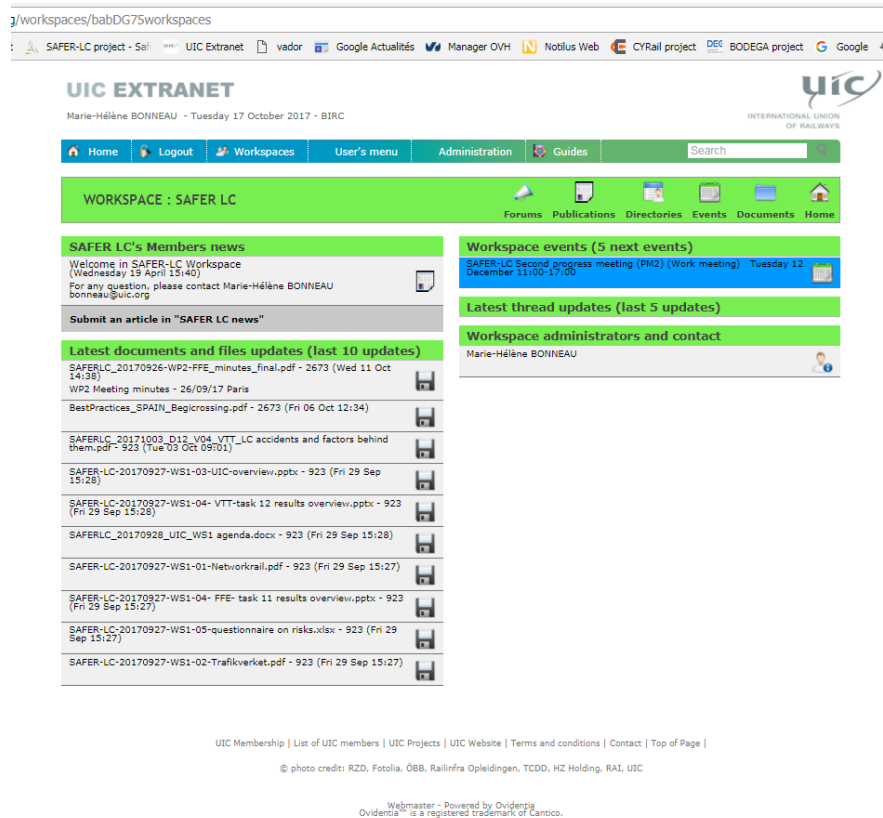


Figure 3 – SAFER-LC private area – Home page of the workspace

3.3. SAFER-LC Toolbox

The most relevant and practical information collected and produced during the project was gathered in the SAFER-LC toolbox for relevant actors of the LC safety community: road and rail infrastructure managers, train operators, engineers, designers, scientists, decision-makers, policy makers, standardisation bodies and rail and road managers.

The SAFER-LC toolbox is a free online tool with both practical and scientific aims. It is a guide for best practice designed to integrate all the recommendations, promising measures and specifications developed during the project in a user-friendly and accessible way. It is based on empirical evidence collected from the scientific literature, practical case studies and from the results and evaluation of simulations and field tests conducted during the project.

UIC developed a web-based interface for this toolbox with the objective to make the information easy to find, to consult and also to update. This toolbox will be continuously updated, even after the end of the project.

The toolbox was presented during the third workshop (WS3) in order to receive feedback from the advisory board as well as UIC and IRU members. An online training session was also organised during the final conference to present the tool and to train the experts to use it.

3.4. Press Releases and articles

The SAFER-LC project produced press releases whenever activities that were of interest to the general public were performed (under the condition that such dissemination activities could be beneficial for the project and no confidentiality and/or security-related issues were at stake).

Press releases and articles published during the project:

Press release and articles for the project kick-off

- UIC press release in English, French and German (around 1,000 addressees)
<http://safer-lc.eu/safer-lc-kick-off-meeting#Press-releases>
- VIA LIBRE daily magazine Bulletin received by email by more than 6,000 subscribers. The magazine's target audience includes experts from the Spanish railway sector, Latin America and many other countries. In Spanish at :
<https://www.vialibre.org/noticias.asp?not=21854&cs=infr>
- CEREMA's Website : <https://www.cerema.fr/fr/actualites/cerema-contribue-au-projet-europeen-safer-lc-innovation>

Press release and articles for the mid-term conference

- UIC press release in English, French and German (around 1,000 addressees) :
https://uic.org/com/IMG/pdf/cp20_safer-lc_mid-term_conference_en.pdf
- VIA LIBRE daily magazine. Bulletin received by email by more than 6,000 subscribers. The magazine's target audience include experts from the Spanish railway sector, Latin America and many other countries. In Spanish at
<https://www.vialibre.org/noticias.asp?not=25419&cs=acti>
- FFE's Website: <https://www.ffe.es/noticias/noticia.asp?id=1000>
- Spanish Railways Technological Platform (PTFE) weekly bulletin. Received by email by 868 persons, all involved in railway research and innovation from the Spanish railway actors. The news is also available at PTFE's website:
<http://www.ptferroviaria.es/boletin/boletin.asp>
- CEREMA's website : <https://www.cerema.fr/fr/actualites/securite-aux-passages-niveau-etape-franchie-10-octobre>

Press release and articles for the final conference

- UIC press release in English, French and German (around 1,000 addressees):
<https://safer-lc.eu/safer-lc-online-final-conference-22-april-2020-from-11-00-to-16-30#Press-Releases>
- International Railway journal (IRJ). (29 April 2020) : article available at:
<https://www.railjournal.com/infrastructure/uic-level-crossing-safety-project-releases-results>
- Press release at FFE's Corporate Website:
<https://www.ffe.es/noticias/noticia.asp?id=1227>
- VIA LIBRE daily magazine Bulletin received by email by more than 6,000 subscribers. The magazine's target audience includes experts from the Spanish railway sector, Latin America and many other countries. In Spanish at:
<https://www.vialibre.org/noticias.asp?not=29350&cs=infr>

- Spanish Railways Technological Platform (PTFE) weekly bulletin. Received by email by 868 persons, all involved in railway research and innovation from the Spanish railway actors. The news is also available at PTFE’s website:
<http://www.ptferroviaria.es/boletin/boletin.asp?item=224>

3.5. Electronic newsletters

Electronic newsletters were used as ideal medium to keep the railway community informed about the project.

3.5.1. UIC Electronic newsletter

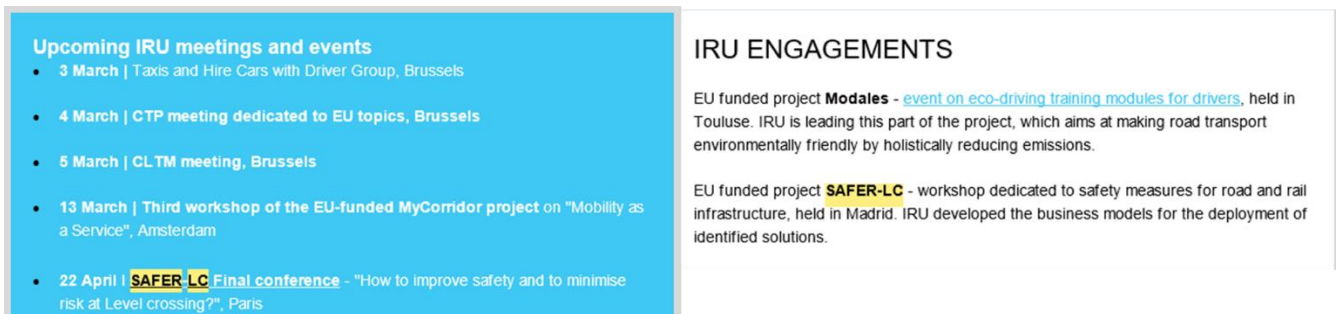
The UIC electronic newsletter (**UIC e-News**), focused on projects and activities, is sent weekly to its stakeholders (railway undertakings, international bodies; more than 5,000 addressees).

Twelve Articles published since the beginning of the project:

http://uic.org/com/uic-e-news/548/	16/05/2017
http://uic.org/com/uic-e-news/552/	13/06/2017
http://uic.org/com/uic-e-news/564/	03/10/2017
https://uic.org/com/uic-e-news/586/	27/02/2018
https://uic.org/com/uic-e-news/593/	10/04/2018
https://uic.org/com/uic-e-news/614/	18/09/2018
https://uic.org/com/uic-e-news/618/	16/10/2018
https://uic.org/com/uic-e-news/632/	05/02/2019
https://uic.org/com/uic-e-news/650/	11/06/2019
https://uic.org/com/uic-e-news/668/	05/11/2019
https://uic.org/com/uic-e-news/678/	11/02/2020
https://uic.org/com/uic-e-news/689/	28/04/2020

3.5.2. IRU Electronic newsletter

IRU uses its electronic newsletter to inform members on the SAFER-LC activities such as events, project results etc. An example of the two latest activities can be found below in Figure 4.



The screenshot shows two sections from the IRU newsletter. The first section, 'Upcoming IRU meetings and events', lists five events: 3 March (Taxis and Hire Cars with Driver Group, Brussels), 4 March (CTP meeting dedicated to EU topics, Brussels), 5 March (CLTM meeting, Brussels), 13 March (Third workshop of the EU-funded MyCorridor project on "Mobility as a Service", Amsterdam), and 22 April (SAFER-LC Final conference - "How to improve safety and to minimise risk at Level crossing?", Paris). The second section, 'IRU ENGAGEMENTS', describes two EU-funded projects: 'Modales' (event on eco-driving training modules for drivers, held in Toulouse) and 'SAFER-LC' (workshop dedicated to safety measures for road and rail infrastructure, held in Madrid).

Figure 4: Examples of SAFER-LC reference in the IRU’s monthly newsletter

3.6. UIC RailDoc Portal

The RailDoc portal is managed by the UIC Documentation Centre. It gives access to the UIC document database with over 26 000 references. SAFER-LC reports are available in this portal which is public with a broad audience of users from transport stakeholders.

The link to UIC RAILDOC portal is the following : <http://raildoc.uic.org/>

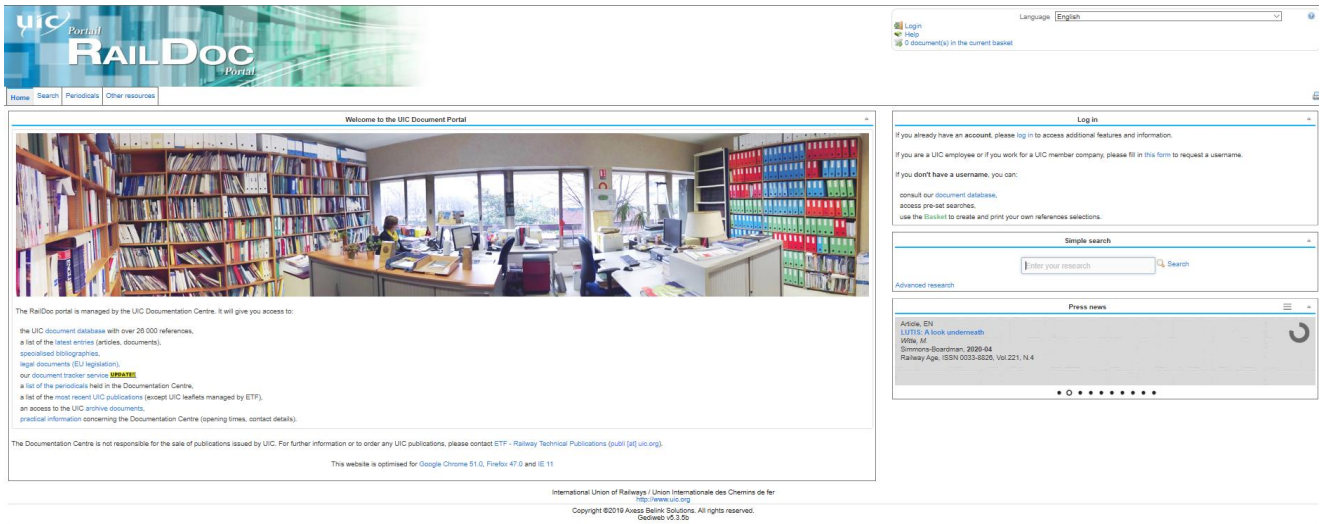


Figure 5: Homepage of RAILDOC portal



Figure 6 : SAFER-LC reports in the RAILDOC Portal

3.7. Social networks

Social networks are very efficient for reaching a large audience or specific communities. Two different networks were chosen: Twitter and ResearchGate.

3.7.1. Twitter

Twitter was one of the channels chosen for disseminating project information to a wide audience. The objective was to use the Twitter accounts of the project's partners to "tweet" pieces of news such as news articles, information about SAFER-LC workshops and events, relevant conferences, major findings to large audiences.

The partners were asked to use the specific hashtag created for the project: #SAFERLC so that all the tweets with #SAFERLC will be published in real time on the homepage of the SAFER-LC website.

One of the key advantages of using Twitter is that it enables the dissemination of short pieces of information which will contribute to driving back the traffic towards the project's website. Another benefit is the multimedia support offered by Twitter, which allows partners to post short videos, text and pictures.

More than 100 tweets with the hashtag #SAFERLC have been produced and are available on twitter at <https://twitter.com/hashtag/saferlc>

A dedicated SAFERLC account (@SAFERLC) was created in October 2018 since it was no longer possible to publish tweets related to the hashtag #SAFERLC in real time on the homepage of the SAFER-LC website. Since October 2018, the tweets displayed on the SAFER-LC website are those from the SAFERLC twitter account at <https://twitter.com/@saferlc>

3.7.2. ResearchGate

ResearchGate was the channel chosen for disseminating information to the scientific community. It is a very efficient social networking site where scientists and researchers share papers, ask and answer questions and find collaborators. At the date of this deliverable, the ResearchGate page of the project has 23 followers and 262 reads. Further information on SAFER-LC is available at <https://www.researchgate.net/project/SAFER-LC-Safer-Level-Crossing-by-integrating-and-optimizing-road-rail-infrastructure-management-and-design>

3.7.3. Sparkrail

www.sparkrail.org is an interactive web toll for the rail industry including a library where users have the opportunity to contribute their knowledge and find new information. This web tool helps the rail industry and its research community to find and share information and creates opportunities for networking and cooperation.

3.7.4. LinkedIn

A group page for SAFER-LC was created in LinkedIn to share some interesting project results and/or other interesting information on LC safety that can be understood by the general public, thus increasing the awareness of SAFER-LC results, LCs and the importance of the safety around LCs.

3.7.5. Brochures/ leaflets

The SAFER-LC brochure (A5 size) introduced the key objectives and the partners of the project (Figure 7). The brochure was released in May 2017 for the kick-off and was updated during the project. It was distributed by all the partners in the conferences, events and meetings that they attended

An electronic version of the brochure is available on the SAFER-LC website at http://safer-lc.eu/IMG/pdf/safer-lc-safer_level-crossing-brochure.pdf as well as a Spanish version at <http://safer-lc.eu/IMG/pdf/safer-lc-brochure-spanish.pdf>



Figure 7 – SAFER-LC Brochure

3.7.6. Final brochure: Lessons learnt

This final guidance was released in April 2020 at the end of the project. In line with the global efforts to improve safety at level crossings (LCs), this guidance document sums up important practical information and recommendations collected and produced during the SAFER-LC project.

There are two parts to the guidance: the first part of the document provides an overview on level crossing accidents and what we can learn from them. It also illustrates several tools that were developed in project SAFER-LC to assess the level of risk and the effectiveness of safety measures: the level crossing risk evaluation method, the Human Factors methodological framework, the safety evaluation framework of safety measures, and the financial evaluation framework of safety measures.

The second part of the document focuses on the actual evaluation of safety measures in project SAFER-LC and recommendations about their implementation. It gives an overview of the pilot test sites and provides examples of safety measures which were tested. These safety measures are presented with implementation tips, potential criticalities, examples, empirical evidence, etc. However, this document includes only a limited collection of the available measures for road and railway stakeholders.

The complete guidance on safety measures for level crossings is available at <https://safer-lc.eu/deliverables-publications-5>



Figure 8 : Final brochure

3.8. SAFER-LC Events

Two types of events were organised.

- Public conferences with large audiences and representatives from all stakeholders were organised at the midterm and at the end of the project. These were unique opportunities to stimulate interest in SAFER-LC and its results, reach wide and varied audiences as well as stimulate discussion and receive feedback.
- Workshops, which were an opportunity to share results, stimulate discussion and gather contributions and technical expertise from the various stakeholders (especially the advisory board).

Table 3 presents the list of conferences and workshops organised by the SAFER-LC consortium during the project:

Table 3 – Dissemination events of the project

Title	Related WP	Date	Location	Type of attendees	Number of attendees
Workshop 1 on end-user' requirements	WP1	28 September 2017	Paris	Advisory board + UIC and IRU members	40
Workshop 2 on Human factor at LC	WP2	27 March 2018	Paris	Advisory board + experts	38
Common workshop with other related projects	WP6	20 February 2018	Brussels	Partners of the related projects and EU representatives	10
Mid-term conference	All	10 October 2018	Madrid	All target groups	80
Workshop 3 on the toolbox evaluation	WP6	5 February, 2020	Madrid	Advisory board + UIC and IRU members	40
Online Final conference and workshop 4 on the toolbox training	All	22 April, 2020	Online	All target groups	180

3.8.1. Workshop 1 on end-user requirements



The First SAFER-LC workshop on “end-user requirements” was held on Thursday 28 September 2017 at the headquarters of UIC. Around 40 participants from 12 countries attended the workshop organised in two sessions: the morning session dedicated to presentations and then a brainstorming session in the afternoon. The participants included road and rail representatives (RUs, IMs, road administrations) from Belgium, Finland, France, Germany, Greece, Hungary, Italy, Norway, Spain, Sweden, Turkey and UK.

In his introductory speech, Marc Antoni, UIC Director of the Rail System department, welcomed the participants from the Advisory Board and consortium. He emphasised the fact that in the media, accidents at level crossings (LC) are presented as rail accidents, when over 90% are due to road drivers and the dangerous/risky behaviour of pedestrians. Level crossing accidents are the second greatest cause of fatalities on rail infrastructure after suicides and trespasses. As suicides and trespasses are already addressed by UIC within the European project RESTRAIL, it was logical for UIC to address level crossing accidents after the creation of the successful RESTRAIL toolbox. The SAFER-LC consortium gathered road and rail experts to gain a holistic view of level crossing safety, enabling the consideration of innovative human and technical solutions. According to differences between the signalling principles in each country, the workshop aimed to identify the needs and requirements for road and rail while considering the disparities in different European countries.

Following the above, Edward Rollings gave Network Rail’s perspective on LC safety in the UK. Level crossings in the UK are regularly evaluated and improved by managing and mitigating their risk. Network Rail is continuously developing and deploying risk reduction measures to enable and encourage safe use. Several measures on the technical side and human side were presented as well as new opportunities that the digitalisation of railways can bring. These included speed supervision, near continuous train location reporting to radio block centre, internet of things and smart access systems.

This was followed by the road perspective with a presentation given by Helena Rådbo from Trafikverket, the Swedish Transport Administration. Helena Rådbo explained the “Toward Zero in Sweden” safety strategy, which is applied at all levels in the country: political, industry and end users. A Database for all LCs has been implemented with information from both road and rail side and reporting of all incident/accidents at level crossings. This makes it possible to overview the system and define the strategy for implementing prevention measures at LCs.

These keynotes speeches on end-user perspectives were followed by the presentation of the first results of SAFER-LC project regarding the analysis of LC safety in Europe and beyond (by Sarah Whalley from FFE) and the identification of typical factors behind LC accidents (by Anne Silla from VTT).

The afternoon consisted of a brainstorming session dedicated to identifying risks and situations leading to dangerous behaviour at LCs as well as innovative solutions to address them.

The aim was to prioritise known LC risks, identify new risks and discuss possible innovative solutions using a questionnaire in small groups. Animators from each of the five tables presented short accounts of the findings on the most significant identified risks and possible innovative solutions.

In total, 25 questionnaires were filled in during the workshop. The participants were asked to identify LC-related high-risk situations from both road and rail perspectives. In addition, participants were asked to assess the criticality of each identified risk situation (high/medium/low perceived risk).

This workshop resulted in valuable contributions from the participants especially for WP1 and the deliverable D1.3 on “Needs and requirements for improving level crossing safety “.

All presentations are available at <https://safer-lc.eu/safer-lc-first-workshop>.

3.8.2. Workshop 2 on Human factor at LC



The second SAFER-LC workshop was held on 27 March 2018 at UIC HQ. In total, 38 road and rail systems experts from 12 countries (Belgium, Finland, France, Germany, Greece, Hungary, Italy, Norway, Poland, Spain, UK, and USA) participated in the workshop.

The workshop was organized around two sessions: the morning session focusing on “Human centred safety measures” led by DLR and the afternoon session on “Cost Benefit Analysis” led by IFSTTAR.

Jerzy Wisniewski, UIC Director of Fundamental values, opened the day and welcomed the participants. Then, Marie-Hélène Bonneau, coordinator of the project, gave an overview of the SAFER-LC project followed by Sarah Walley from FFE, who presented the first results of WP2 on “human factors at LC and design for self-explaining and forgiving infrastructure”. Over two hours were then dedicated to a brainstorming session organized by Annika Dressler and Jan Grippenkov from DLR on innovative human centred measures. Six groups were arranged to consider three types of level crossings (full barrier, half barrier and/or flashing light, and passive) with different scenarios: motorised users (car drivers, motorcyclists, truck drivers) and vulnerable users such pedestrians, cyclists and disabled persons. Each of the groups consisted of six to seven experts who produced and documented approximately 20 ideas for safety enhancement. Another group then evaluated the ideas on three criteria: effectiveness, cost-efficiency and innovativeness.

The afternoon session began with Reginald R. Souleyrette from the University of Kentucky in US. He explained ongoing work related to level crossing safety within the National University Rail (NURail) Centre, which is a consortium of seven partner colleges and universities. He presented studies on In-Vehicle Alerts (how best to warn drivers), Integration of driving simulators and naturalistic driving study data as well as projects on risk analysis and the evaluation of infrastructure solutions.

This presentation was followed by a brainstorming session on cost-benefit analysis (CBA) animated by Mohamed Ghazel and El-Miloudi El Koursi from IFSTTAR. Work package 5 was dedicated to



CBA, and El-Miloudi El Koursi presented final recommendations for CBA as well as lessons learnt from past projects (RESTRAIL, SELCAT).

Then, ten questions were presented, discussed and answered by the participants on various CBA components such as values of life, accident cost (property damage), values of delays, LC data, factors to determine risky LCs, cost of measures, effects of accidents which usually are not monetarized, social analysis and ethical issues.

The day was very productive with a wealth of level crossing safety enhancement ideas produced and evaluated. The results were analysed and included in the deliverables on human factor centred low cost measures (D5.3) and on CBA (D5.1).

All of the day's presentations are available at <https://safer-lc.eu/safer-lc-second-workshop>.

3.8.3. Mid-term conference



SAFER-LC held its mid-term conference on 10 October 2018 in Madrid, at the Spanish Railway Foundation HQ in the presence of around 80 participants from 18 countries in Europe. The audience was composed of experts from rail and road infrastructure managers and operators, safety authorities, policy makers and researchers and other stakeholders involved in enhancing the safety of level crossings.

This one-day conference was opened by Mr Cesar Lopez, General Manager of the Spanish Railway Foundation (FFE), who underlined the importance of integrating both road and rail visions for improving safety and security at level crossing. Jacques Colliard, Head of UIC Security Division, put emphasis on the interest of European funded projects to bring together experts from road and rail sectors with complementary skills.

The first two sessions were dedicated to SAFER-LC project achievements, ongoing work and the next steps within specific work packages.

Regarding Human Factors at level crossings, two main achievements were presented:

- The human assessment tool: this tool has been developed and will be applied to assess the solutions evaluated within the project from a human perspective on short- and long-term scales, for example from the point of view of behavioural improvement, acceptance, reliability, usability.
- A set of measures to enhance LC Safety were collected, tested and evaluated. For example: LCs as self-explaining as possible, improving visibility, using signs and symbols that road users are familiar with, conveying relevant message via onboard systems.

The second session was dedicated to technical solutions for smarter Level Crossings. Ongoing development focused on:

- Technologies to detect dangerous situations such as an advanced off-line video surveillance system based on machine learning for modelling and analysing LC users' behaviour in order to assess the risk at LCs

- Optimised real time Automatic Incident Detection (AID) dedicated to LCs (Detection of dangerous situation such as vehicle stopped at LC, vehicle zigzagging on the LC, Pedestrians crossing while barriers are closed, etc.)
- Newly developed and readily available smart wireless sensing technologies as well as photogrammetric device, for monitoring and remote maintenance of LC.
- A communication system to increase awareness of the relevant people (road users and rail infrastructure managers and operators) about the detected dangerous situations at LCs. V2X, ITS-G5 and LTE communication systems will be integrated and tested to share the information related to the dangerous situation detected.

These developments will be integrated, tested and evaluated from both technical and human factor perspectives in the next phase of the project. Three types of testing environments have been selected: simulation; controlled environment, real-world field tests. Nine pilot tests are now being implemented and the tests will be executed until April 2019.

The following sessions were dedicated to learning from related projects at national and international levels:

- ADIF, Spanish rail Infrastructure Manager, described the LC protection systems in Spain as well as an ongoing research project on a new real-time surveillance system based on an artificial vision.
- INSPIDE in Spain presented their onboard vehicle solution COMOBITY to better protect vulnerable users (Cyclist and pedestrians).
- CDV, research centre for transport in Czech Republic explained the risk factors at level crossings with flashing lights in the Czech Republic
- FPZ, the university of Zagreb which worked closely with Croatian Infrastructure manager (HZ) gave an overview on the level crossing safety campaign in Croatia
- PRORAIL, rail Infrastructure Manager in The Netherlands, described innovative measures recently deployed
- SAFE STRIP H2020 project on “Safe and green Sensor Technologies for self-explaining and forgiving Road Interactive aPplications” was presented by ERTICO. A Safer Rail Crossings Use Case will be developed and tested together with SAFER-LC.
- DIGIM UIC Global project on Digital Impacts on Business processes was also presented and especially the POC developed by ViaRAIL on how to estimate the closing time of LCs and advice the cars drivers about the best behaviour (waiting or alternative route).

Finally, the next steps of the SAFER-LC project were pointed out as it follows:

- Execution of the Pilot Tests
- Evaluation of the measures from technical and human factor perspectives
- Development of business models
- Design and development of the toolbox to gather solutions and recommendations to prevent accidents at LC.

The presentations are publicly available on the website at <http://safer-lc.eu/safer-lc-mid-term-conference-17>.

3.8.4. Third workshop held on 5 February 2020 at FFE premises in Madrid, Spain



Approximately 40 road and rail safety experts from 10 countries attended the third SAFER-LC workshop held on Wednesday 5 February 2020 in Madrid. The event was hosted by the Spanish Railway Foundation (FFE), partner of the SAFER-LC Consortium.

The workshop was organised around two sessions: the morning session focused on the SAFER-LC toolbox evaluation and the afternoon session on the key results already achieved by the project.

The SAFER-LC Toolbox, developed by UIC within the SAFER-LC project, is a tool to support decision-making for increasing level crossing safety. The update is still a work in progress. The

workshop objectives were to: obtain new expert input and ideas to improve the existing content of the tool, and to collect expert feedback about the user interface.

The session started with a short tutorial on how to use the toolbox. The participants then organised in six small groups to perform an evaluation exercise. Each group received a generic description (scenario composed of an image and a short text) of a problem (unsafe level crossing) and was asked to solve the problem with the help of the toolbox.

The six group user cases were followed by an evaluation and feedback collection that was used to improve the tool. During the exercise debriefing, the tool was universally appreciated and considered very promising.

During the afternoon session, the results achieved within each work package were presented. The presentations given during this session are available at https://safer-lc.eu/third-safer-lc-workshop-ws3-ffe-premises-05-february-2020-madrid-spain-from-9?var_mode=calcul

Thanks to the active participation and contributions from the attendees, the day was very productive with participants providing constructive feedback and recommendations for the improvement of the toolbox.

These inputs will be useful for the consortium to make the toolbox more user friendly and better suited to the needs of the end-users who must easily find the most appropriate safety measure to increase safety at LC.

All presentations are online at <https://safer-lc.eu/third-safer-lc-workshop-ws3-ffe-premises-05-february-2020-madrid-spain-from-9>

3.8.5. Final conference and Fourth workshop on “Toolbox training”

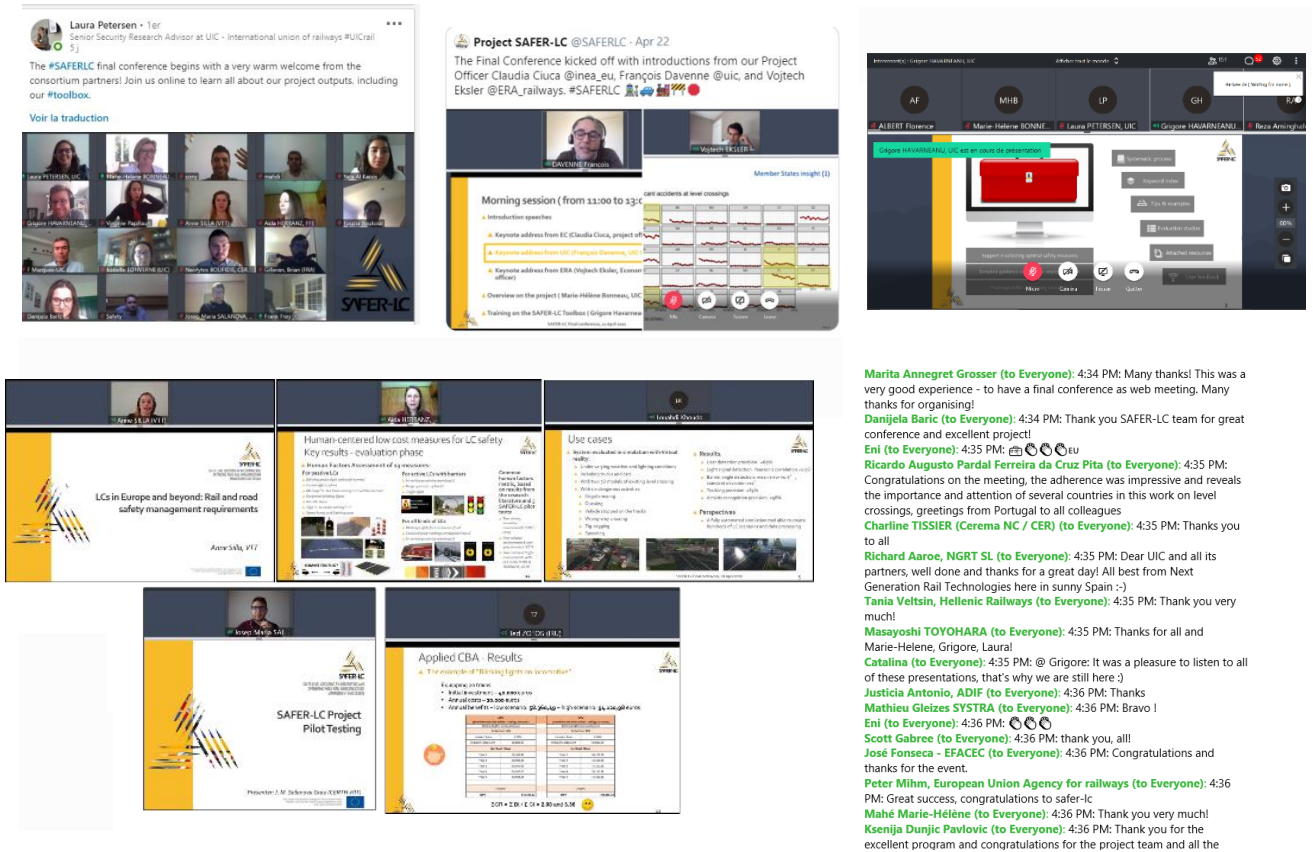


Figure 9: Screenshots from the online project final conference and extract of the Chat box

SAFER-LC hold its Final Conference online on 22 April 2020. As meeting face to face was not an option because of the COVID-19 crisis, we shifted the conference online (using the GotoMeeting platform). More than 180 participants from around 35 countries all over the world (USA, Canada, Australia, India, Japan, Egypt, Iran, Lebanon, Jordan, Turkey and European countries) attended this conference organized by UIC (International Union of Railways) to discuss the findings and main outputs of SAFER-LC.

The morning session:

The conference was opened by the EC project officer, Claudia Ciuca, who thanked the consortium to make this event possible despite this difficult period. She reminded that SAFER-LC was one of the three projects funded in 2016 within H2020 programme Mobility for growth in the topic transport infrastructure innovation to increase safety of transport in Europe. She thanked the consortium for all the work done in the past three years and wished everyone a fruitful day.

Then Mr François Davenne as Director General of UIC thanked all those who have been involved in this project. “The 17 members of the consortium brought a range of complementary skills and were able to work together during 36 months in a spirit of collaboration to share their respective competences in their work on this human, societal and technical issue”. He added “The results achieved are particularly interesting and effective for the stakeholders both in rail and road environment. The results take the shape of a toolbox, design to help decision makers to increase safety at level crossings through practical recommendations. Moreover, it will enable policymakers and stakeholders to select and implement the most appropriate strategies, measures and cost-effective approaches to make Level crossing safer for all road user types at LC”. He concluded that “Level crossing safety is a very relevant safety and UIC will continue to exploit the results of the project both in Europe and on a global scale, first through the SAFER-LC toolbox which will be hosted and updated by UIC after the project, and secondly as UIC is very committed to along with various institutional partners, and in particular within the framework of the annual “ILCAD International Level Crossing Awareness Day”.

The opening session was concluded by Vojtech Eksler (ERA – European Union Agency for Railways) who presented the latest data from level crossing accidents in Europe. He reported that each year, almost 300 people die in accidents at level crossings in the EU. He underlined that the distraction has become even more visible with the explosion of technologies used in daily life. It unveils and emphasizes the central role of a human at the intersection of road and rail.

After a quick overview on the project, a hands-on training of the toolbox developed within SAFER-LC was given by Grigore Havarneanu, Senior Research Advisor at UIC. He explained that from the very beginning, SAFER-LC has wanted to produce an outcome that would outlive the project. That is why the toolbox was designed as a web-based platform that will be updated by UIC past the project lifetime. He also emphasised that the toolbox can be used as a decision support tool which regroups in a user-friendly manner several assessment methodologies as well as a wide range of cost-effective safety measures, accompanied by study results.

He used a live online training session to illustrate some toolbox content and demonstrate how advanced search can be performed using different criteria relevant for level crossing safety. There are many ways to sort the various safety measures: type or users and level crossing, costs, effect mechanism, etc. and this can help end-users find the most appropriate measure for a specific context. During the tutorial, the participants had a closer look at the individual safety measures in the toolbox. Each measure is presented through a short description, the potential benefits and criticalities, recommendations, study results, main psychological functions involved, documents, related measures, a gallery of examples, and a comments section.

The live tutorial on how to use the toolbox lasted one hour, and participants had the opportunity to ask questions at the end. At the end of the training, Grigore Havarneanu reminded that although the SAFER-LC toolbox was officially launched, the work is not over and will never be. Along with the SAFER-LC consortium, UIC will be looking forward to new inputs and feedback from the toolbox end-users to continue updating it.

The afternoon session:

The afternoon session started with the presentations of the work achieved by the SAFER-LC partners focusing on level crossing safety in Europe and beyond, the human processes at level

crossing, the technical solutions developed and integrated for smarter level crossing, the pilot tests and evaluation, the Cost-Benefit Analysis and the final recommendations.

Beyond the SAFER-LC project, speakers from Japan East Railways and US Department of Transportation provided inspiring presentations on protection of level crossings outside of Europe.

To conclude, Marie-Hélène Bonneau, Head of UIC Security Division and SAFER-LC project coordinator, thanked the partners for the great cooperation during these 3 years, the external experts who contributed to the work through the various workshops and the attendees of the conference for their active participation, especially through the chat with hundreds of questions and comments. She underlined that the project is over, but the work will continue, especially the exploitation of the toolbox which will be continuously updated by UIC to provide the users with a comprehensive decision-making tool for safer level crossing.

The statistics of the meeting show that 190 participants joined the conference. An average of 140 participants were online simultaneously. Despite the fact that the meeting was online, the day was very interactive with around 300 questions/comments/messages in the chat box.

All the presentations are online at <https://safer-lc.eu/safer-lc-online-final-conference-22-april-2020-from-11-00-to-16-30>.

The conference was initially planned in Paris, UIC HQ with a Poster session. Below the series of posters prepared for this session :



Figure 10 : Posters prepared for the final conference

3.9. Relevant International Conferences and Events

Table 4 lists the international conferences and events where the SAFER-LC project partners have given presentations.

Table 4 – Past International Conferences and Events

Title	Date	Countries addressed	Type of Audience	Frequency	Dissemination actions	Partner involved	Location
PTFE – Safety of the rail system	9 May 2017	Spain	Rail safety expert	One-time	Presentation of SAFER-LC	FFE	Madrid, Spain
9th International Level Crossing Awareness Day (ILCAD).	2 June 2017	Worldwide	Rail and road safety experts	Annual	Presentation of SAFER-LC Distribution of brochures Networking	UIC	Montreal, Canada
IRU Road Safety Commission	4 Oct. 2017	Worldwide	Road Safety experts	Biannual	Presentation of SAFER-LC Distribution of brochures Networking	IRU	Geneva, Switzerland
27th IRSC - International Railway Safety Conference	22–27 Oct. 2017	Worldwide	rail safety sector	Annual	Information on SAFER-LC Distribution of brochures Networking	UIC	Hong Kong
UIC Safety platform	15 Nov. 2017	Europe	rail safety sector	Biannual	Presentation of SAFER-LC and discussion on end-user's requirements	UIC	Paris, France
ECLF meeting	15 Nov. 2017	Worldwide	Level Crossing experts		Presentation of SAFER-LC results Distribution of brochures	UIC	Paris, France
IRSA – International Railway Symposium	28–30 Nov. 2017	Worldwide	Rail Researcher and professional	Biennial	Information on SAFER-LC Distribution of brochures Networking	RWTH	Aachen, Germany
UNECE Working party on road traffic safety	2017, 2018	European (enlarged)	LC experts	annual	Presentation of SAFER-LC results Distribution of brochures Networking	UIC	Geneva, Switzerland

2018 TRB (Transportation Research Board) Annual Meeting	7–11 Jan. 2018	Worldwide	Transport experts	annual	Presentation of SAFER-LC results Distribution of brochures Networking	CERTH	Washingto n, D.C, U.S.
CES	9–12 Jan. 2018	Worldwide	Automotive	Annual	Information on SAFER-LC Distribution of brochures Networking	COMM	Las Vegas, NV, USA
Tokyo Auto Salon	13–15 Jan. 2018	Worldwide	Automotive	Annual	Information on SAFER-LC Distribution of brochures Networking	COMM	Tokyo, Japan
TRA 2018 - Transport research area	16–19 Apr. 2018	Europe	Researcher authority	Biennial	Presentation of SAFER-LC results Presentation of the project in the EU Stand Distribution of brochures	UIC	Vienna, Austria
3rd German Workshop on Rail Human Factors	17–18 Apr. 2018	Worldwide	Rail Human factors experts, Rail Industry	Biennial	Presentation of SAFER-LC results Distribution of brochures Networking	DLR	Braunsch weig, Germany
7th annual scientific seminar of Norwegian University of Science & Technology	7–8 May 2018	North Europe	Rail safety experts	Annual	Presentation of SAFER-LC results Distribution of brochures Networking	VTT	Trondheim, Norway
10th International Level Crossing Awareness Day (ILCAD).	7 June 2018	Worldwide	Rail and road safety experts	Annual	Presentation of SAFER-LC Distribution of brochures Networking	UIC	Zagreb, Croatia
TU Automotive Trade Show	08–10 June, 2018	Worldwide	Automotive	Annual	Information on SAFER-LC Distribution of brochures Networking	COMM	Detroit, MI, USA
2nd Car 2 Car CC meeting	21–22 June 2018	Europe	Automotive	Multiple	SAFER-LC Distribution of brochures Networking	COMM	Wolfsburg, Germany
ETSI Workshop on Future Rail Communications	4–5 July 2018	Europe	Automotive	One time	Participation in standardisation, networking	COMM	Sophia Antipolis, France

5GAA plenary meeting	11 July 2018	Worldwide	Automotive	Multiple	Participation in standardisation, networking	COMM	Paris, France
ECCV 2018 (European Conference on Computer vision)	01 Sept. 2018	Worldwide	Research	annual	Presentation of SAFER-LC research results	Cerema, UTBM, IFSTTAR at least	Germany
4th International Conference on Railway Technology: Railways 2018	3-7 Sept. 2018	Worldwide	Research	annual	Presentation of SAFER-LC research results	CERTH	Barcelona, Spain
INNOTRANS 2018	17-20 Sept. 2018	Worldwide	Rail Industry	Annual	Distribution of brochures Networking	COMSIGNI A	Germany
ITS World Congress	17-21 Sept. 2018	Worldwide	Transport	Annual	SAFER-LC Distribution of brochures Networking	COMM	Copenhagen, Denmark
13th CRITIS (International Conference on Critical Information Infrastructures Security)	23-26 Sept. 2018	Worldwide	Research	Annual	Distribution of brochures Networking	UIC	Lithuania
2nd Car 2 Car CC meeting	27 Sept. 2018	Europe	Automotive	Multiple	SAFER-LC Distribution of brochures Networking	COMM	Magdeburg Germany
2018 25th IEEE International Conference on Image Processing (ICIP)	9-10 Oct. 2018	Worldwide	research	Annual	Presentation of SAFER-LC research results, Poster	CEREMA	Greece
28th IRSC - International Railway Safety Conference	22-25 Oct. 2018	Worldwide	rail safety sector	Annual	Information on SAFER-LC Distribution of brochures Networking	UIC	Dublin, Ireland
RTR18 Conference - European Conference on Results from Road Transport research in H2020 projects	28 -29 Nov. 2018	Europe	Road Transport sector	Annual	Presentation of SAFER-LC research results Distribution of brochures Networking	UIC	Brussels, Belgium

ELCF (European Level Crossing Forum) Meeting	26 March 2019	Europe	Rail and road safety experts		Presentation of SAFER-LC research results Distribution of brochures Networking	UIC	Paris, France
FIRM 2019 – FEHRL Infrastructure Research meeting	28 March 2019	Europe	Research	Annual	Research	UIC	Brussels, Belgium
TAP Conference 2019	15–17 May 2019	Europe	Research	Annual	SAFER-LC Poster presented by CERTH	CERTH	Thessaloniki, Greece
10th International Level Crossing Awareness Day (ILCAD).	6 June 2019	Worldwide	Rail and road safety experts	Annual	Presentation of SAFER-LC Distribution of brochures Networking	UIC	Brainport, The Netherlands
ITS European Congress 2019	3–6 June 2019	Europe	Industry	Annual	VTT and CERTH Papers Cluster session	VTT, UIC, CEREMA, CERTH	Brainport, The Netherlands
22nd Euro Working Group on Transportation Meeting (EWGT)	18–20 Sept 2019	Europe	Research	Annual	Presentation of SAFER-LC results	CERTH	Barcelona, Spain
TIS Roma 2019 conference (2nd International Congress on Transport Infrastructure and Systems)	Sept. 2019	Worldwide	Research	Annual	Presentation of SAFER-LC results	UNIROMA 3	Roma, Italy
International Congress of Applied Psychology and Education Sciences.	17–20 Oct. 2019	Worldwide	Research	Annual	Presentation of SAFER-LC results	UIC	Romania
ICIP 2019	24–25 Oct. 2019	Worldwide	research	Annual	Presentation of SAFER-LC research results	Cerema, UTBM, IFSTTAR at least	Taiwan
ITS World Congress	21–25 Oct. 2019	Worldwide	Industry	Annual	Presentation of SAFER-LC results	VTT	Singapore

ICTR (International Congress on Transportation Research)	24–25 Oct. 2019	Worldwide	Research	Annual	2 papers presented Poster awarded	CERTH, DLR	Athens, Greece
10th Railway Innovation Congress	24–25 Oct. 2019	Europe	Research	annual	Presentation of SAFER-LC results	FFE	Merida, Spain
UIC Safety Platform plenary meeting	05 Nov. 2019	Worldwide	Rail Safety expert		Worldwide	UIC	Paris, France
ERTRAC Road Safety R&I Workshop	15 Nov 2019	Europe	Research	Annual	Presentation of SAFER-LC results	DLR	Brussels, Belgium
Seminar dedicated to the Level Crossing issues organised by the Transport Community Secretariat (TCS).	21 Nov. 2019	Western Balkans	rail and road safety experts		Presentation of SAFER-LC results	UNIROMA 3	Belgrade, Serbia
TRB 2020	12–16 Jan 2020	Worldwide	Research	Annual	Presentation of SAFER-LC results	CERTH	Washington, U.S.
ERA Safety conference	25–26 Feb. 2020	Africa	Rail Safety experts	Annual	Presentation of SAFER-LC toolbox	UIC	Algiers, Alger
ELCF (European Level Crossing Forum) Meeting	12 March 2020	Europe	Rail and road safety experts	Annual	Presentation of SAFER-LC Toolbox	UIC	online
TRA 2020 - Transport Research Arena	27–30 April, 2020	Europe	Researchers authorities	Biennial	- One presentation selected - One 1 invited session selected Cancelled due to the COVID-19	UIC, DLR	Helsinki, Finland

23rd International IEEE Conference on Intelligent Transportation Systems	20-23 Sept.	Worldwide	Industry	Annual	Paper Submitted	CERTH	Island of Rhodes, Greece
ICTTP 2020: International Conference on Traffic and Transport Psychology	25-27 August	Worldwide	transport safety experts; psychologists	Annual	Presentation accepted	VTT	Gothenburg, Sweden
2020 ITS World Congress	4-8 Oct.	Worldwide	Industry	Annual	Paper accepted	CEREMA	Los Angeles, California

3.10. Publications

The most valuable information worth disseminating through scientific papers were identified and respective papers through relevant conferences and journals will be written and published.

Relevant papers will target railway and traffic journals (e.g. International Railway Review, ETRR – European transport review research, EI- Der Eisenbahningenieur, S+D Signal und Draht, ZEV Rail etc.) as well as general traffic and safety research journals (e.g. Accident Analysis and Prevention, Transportation Research Part F, Journal for Transportation Safety and Security etc.) and journals related to intelligent transport (e.g. IEEE Transactions on Intelligent Transportation systems, IEEE Transactions on Vehicular technology etc.).

Scientific peer-reviewed open access articles published during the project:

- Havârneanu, G.M., Dreßler, A., Grippenkov, J., Silla, A., Prieto, E., & Bonneau, M.-H. (2018). SAFER-LC project: Safer Level Crossings by integrating and optimizing road-rail infrastructure management and design. Proceedings of 7th Transport Research Arena TRA 2018, April 16-19, 2018, Vienna, Austria. In press on Zenodo (<https://zenodo.org/>)
- Silla, A., Virtanen, A., Lehtonen, E., Mesimäki, J., Bialinska, K., Grippenkov, J., & Dressler, A. (2019). Auxiliary strobe lights improve train visibility. Paper presented at 26th Intelligent Transport Systems World Congress, ITS Singapore 2019, Singapore.
- Virtanen, A., Silla, A., Jokela, M., & Kauvo, K. (2019). Railroad level crossings and an autonomous vehicle. Paper presented at 13th ITS European Congress, Brainport Eindhoven, Netherlands.
- Dreßler, A., Silla, A., Kortsari, A., Havârneanu, G., Whalley, S., & Grippenkov, J. (2020). Human-centered measures to enhance safety at level crossings. Transport Research Arena 2020, Helsinki, Finland. (Conference cancelled due to COVID-19, book of abstract and articles published)
- Carrese, S., Petrelli, M., Renna, A. (2020). Safety at LCs in Italy: evidence from the Safer-LC Project. In Transportation Research Procedia vol. 45 pp.562-571,

Other publications published during the project:

- January 2018: EI – Der Eisenbahningenieur (Railway Engineer): "SAFER-LC: Innovative Lösungen für mehr Sicherheit am Bahnübergang" (SAFER-LC: Innovative solutions for enhanced safety at level crossings) – introduction of the project (DLR)
- November 2018: Intelligent Transport magazine - safety & security supplement: Common article with SAFER STRIP and SAFE TEN-T (UIC)
- September 2019: periodica polytechnica (<https://pp.bme.hu/>) - "Analysis of in-vehicle warning system for Rail-Road Level Crossings. Case study in the city of Thessaloniki, Greece." (CERTH)
- January/ February 2019: S+D Signal und Draht – "Performance indicators for innovative safety measures at Level Crossings" (DLR)
- April 2020: Global Railway Review – Article on Level crossings including information on SAFER-LC

Publications currently in preparation:

- Dreßler, A. & Gripenkoven, J. (in prep.) Look for train: How do low-cost safety measures affect driver behavior at passive road-rail grade crossings?

4. MONITORING AND EVALUATION

In order to measure the impact and thus conduct the most accurate assessment of the dissemination activities, a set of key performance indicators were defined. Table 5 addresses the key performance indicators, their relevance to the tools/channels used and the estimated target value.

Table 5 – Estimation of Dissemination Key Performance Indicators

Tools/Channels	Key Performance Indicators	Target value	Value
Project Website	Total visits to Project's website	5,000 per year	Around 2,000 visits per month
UIC weekly e-Newsletter	Number of Subscribers	5,500 per e-Newsletter	5,000
Press Release	Number of media contacts at UIC (all UIC press releases are issued in 3 languages: English, French, German)	3,500 media contacts per release	3 x 3500
Congress/conferences	Number of presentations	10 per year	50
Workshop and conferences	Number of events organised	2 per year	5
SAFER-LC Toolbox	Number of users that will test and evaluate the toolbox	100	200
Mailing	Number of targeted emails	200 per year	750
Brochures / leaflets	Number of brochures printed and distributed	500 per year	1,000
Publications	Number of publications	4 /year	7

SAFER-LC website statistics

- The number of page visitors and page views are shown below

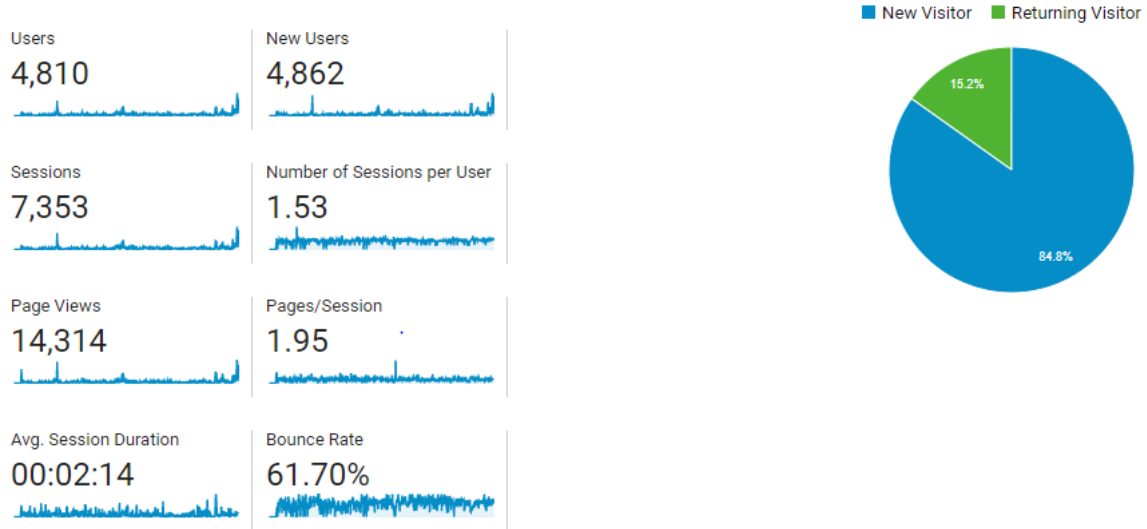


Figure 11 – Number of visitors, sessions, page views

- The top page views are shown in the figure below

Page	Page Views
	14,314 % of Total: 100.00% (14,314)
1. /	7,046 (49.22%)
2. /deliverables-publications-5	1,355 (9.47%)
3. /about-safer-lc	1,092 (7.63%)
4. /consortium	785 (5.48%)
5. /project-structure	693 (4.84%)
6. /events	651 (4.55%)
7. /links	408 (2.85%)
8. /contact	355 (2.48%)
9. /safer-lc-online-final-conference-22-april-2020-from-11-00-to-16-30	303 (2.12%)
10. /safer-lc-mid-term-conference-17?var_mode=calcul	221 (1.54%)

Figure 12 – Top page views

- The source of traffic shown in the figure below

Source/Medium ?	Acquisition		
	Users ? ↓	New Users ?	Sessions ?
	4,810 % of Total: 100.00% (4,810)	4,866 % of Total: 100.08% (4,862)	7,353 % of Total: 100.00% (7,353)
1. (direct) / (none)	2,739 (54.53%)	2,761 (56.74%)	3,669 (49.90%)
2. google / organic	1,112 (22.14%)	1,035 (21.27%)	2,192 (29.81%)
3. uic.org / referral	237 (4.72%)	194 (3.99%)	379 (5.15%)
4. automatedtraffic4free.pw / referral	213 (4.24%)	215 (4.42%)	231 (3.14%)
5. baidu.com / referral	171 (3.40%)	171 (3.51%)	171 (2.33%)
6. bing / organic	54 (1.08%)	53 (1.09%)	75 (1.02%)
7. ffe1.mailrelay-iv.es / referral	37 (0.74%)	33 (0.68%)	49 (0.67%)
8. 99-reasons-for-seo.com / referral	29 (0.58%)	29 (0.60%)	29 (0.39%)
9. ifs.rwth-aachen.de / referral	29 (0.58%)	28 (0.58%)	37 (0.50%)
10. t.co / referral	29 (0.58%)	20 (0.41%)	54 (0.73%)

Figure 13 - Source of Traffic

5. ORGANISATION OF THE DISSEMINATION

UIC is responsible of the dissemination and exploitation of the results work package.

The dissemination manager is responsible for:

- Producing dissemination material
- Organising the final conference
- Keeping track and reporting back to the project officer on the project dissemination activities;
- Ensuring proper use of public dissemination materials with respect to partners' IPRs
- Ensuring consistency of project image and published contents
- Making sure of optimum use of the project dissemination resources

Partners are expected to contribute by:

- Identifying and informing the consortium about dissemination opportunities (e.g. events, publications, etc.)
- Promoting the project results in their own organisation with press releases and web pages as well as presentation of the project in relevant national events.
- Submitting technical papers and presenting the project results at relevant external conferences according with the project quality plan
- Suggesting stakeholders to be invited to the related conferences helping to promote the project

Each dissemination action needs to be reported to the dissemination manager (UIC).

6. DISSEMINATION RULES

- **The disclaimer below should be added to every technical document:**

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- **For all publications mentioning the SAFER-LC project, the sentence below must be added:**

"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 723205"

- **The logo below should also be included**



- **Chapter 8.4 of the consortium agreement shall be respected:**

Chapter 8.4 on dissemination extracted from the consortium agreement is displayed below:

8.4.1. For the avoidance of doubt, nothing in this Section 8.4 has impact on the confidentiality obligations set out in Section 10.

8.4.2. Dissemination of own Results

During the Project and for a period of 1 year after the end of the Project, the dissemination of own Results by one or several Parties including but not restricted to publications and presentations shall be governed by the procedure of Article 29.1 of the Grant Agreement subject to the following provisions.

Prior notice of any planned publication shall be given to the other Parties at least 30 calendar days before the publication. Any objection to the planned publication shall be made in accordance with the Grant Agreement in writing to the Coordinator and to the Party or Parties proposing the dissemination within 14 calendar days after receipt of the notice. If no objection is made within the time limit stated above, the publication is permitted."
