




**Improved Robotic Platform to perform  
Maintenance and Upgrading Roadworks:  
The HERON Approach**

**Grant Agreement Number: 955356**

**D8.2: Project Website**

<b>Work package</b>	WP8: High-Impact Communication and Dissemination Activities
<b>Activity</b>	Task 8.3: Development and use of dissemination materials and tools
<b>Deliverable</b>	D8.2: Project Website
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<b>Status</b>	Final (F)
<b>Version</b>	1.0
<b>Dissemination Level</b>	Public (PU)
<b>Document date</b>	31/08/2021
<b>Delivery due date</b>	31/08/2021
<b>Actual delivery date</b>	31/08/2021
<b>Internal Reviewers</b>	Matthaios Bimpas (ICCS), Stefanos Camarinopoulos (RISA)
	This project has received funding from the European Union’s Horizon 2020 Research and Innovation Programme under grant agreement no 955356.

## Document Control Sheet

Version history table			
Version	Date	Modification reason	Modifier
0.1	25/06/2021	Initial Table of Contents	Dimitrios Vamvatsikos
0.2	01/07/2021	Basic structure of the deliverable	Eirini Vourlakou
0.3	20/07/2021	Version modified with the feedback from all partners	All partners
0.4	26/07/2021	First Draft	Dimitrios Vamvatsikos, Athanasia Kazantzi
1.0	31/07/2021	Final version ready for submission	Matthaios Bimbas

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## Abbreviation List

<b>Abbreviation</b>	<b>Definition</b>
CMS	Content Management System
HTTP	Hyper Text Transfer Protocol
HTTPS	Hyper Text Transfer Protocol Secure
URL	Uniform Resource Locator
WP	Work Package

## Executive Summary

Deliverable 8.2 “Project Website” provides a brief description of the HERON website and its main functionalities. It stems from Task 8.3 “Development and use of dissemination materials and tools”, under WP8 “High-Impact Communication and Dissemination Activities”.

Within WP8 all the activities linked to the communication and dissemination of the project outcomes and results are served by web-based means. Following this rationale, a project website has been developed in view of communicating and disseminating the project, including project objectives, project’s news, technology news, all project public documents (deliverables, presentations, scientific publications etc.), as well as consortium contacts.

In its present form, the deliverable reflects the current status of the website and the planned content that will be developed during the project progress. Modifications and improvements will occur during the course of the project to address any additional needs that will be identified later on. The website will be maintained and updated on a regular basis during the project’s lifetime and after the project’s end in order to provide all interested stakeholders with information on project results and contact details.

## 1 Introduction

### 1.1 Purpose of the Document

The HERON Deliverable 8.2 namely “Project Website”, introduces the first version of the project website that was developed in order to enhance the visibility and the accessibility of the project results and overall promote the exploitation of the project findings to the interested stakeholders.

The project website is created to enable the HERON project to communicate its goals, some key facts and introduce the HERON partners to the general public, in order to start raising awareness among the target groups.

### 1.2 Intended Audience

The targeted audience of the present document is the HERON consortium partners. This report presents all the tools that will be used for enabling and monitoring the project endeavors and and raise awareness about its findings and innovations among the targeted stakeholders and end users.

### 1.3 Roles of the Partners

The project website was created and will be continuously updated under the Work Package 8 activities and during the entire duration of the HERON project (48 Months). This task is led by Resilience Guard GmbH, under the coordination of CORTE, who is leading WP8.

## 2 HERON Project Website

### 2.1 Domain name

The URL “www.heron-h2020.eu” is employed to portray our project branding and its European nature. The project URL will be included in all communication and dissemination material that will be produced, as an integral part of our online and offline identity. The project URL has been added to the leading international search engines (i.e. Google, Bing) so as to increase the online visibility of the HERON project.

### 2.2 Hosting and maintenance

The site is hosted by IPGLOBAL IKE [1], an experienced webhosting provider in Greece.

The webpage was setup by ResilienceGuard GmbH who is the only partner with administrative rights on both the hosting server and the website backend, and is responsible for the technical maintenance of the website. In case of any question or difficulty regarding technical maintenance, Mr. Fanis Markou ([fanis.markou@resiliencegard.ch](mailto:fanis.markou@resiliencegard.ch)) is the contact point from the consortium.

### 2.3 Content Management System

The aim of the HERON project website is to provide general information and news about the project whereas it will also serve as a repository for its public outcomes, using an open source web publishing platform. Towards this direction, we have taken the conscious decision to design it on WordPress (current WordPress version is 5.6) , which is the most popular free and open-source Content Management System (CMS).

The WordPress CMS was selected since it is continuously updated and supported by its vast developer community, and this provides an extra assurance for the website’s security and uptime. Moreover, it enables the use of various plugins and features, such as easy multiuser publishing, seamless cross-linking to social media content from multiple sources, easy manipulation of user input and all website content from a very user-friendly administration console.

The CMS was further customized by selecting the Avada theme, as it is one of the most popular multi-purpose WordPress themes. It offers multiple page layouts, plenty of customization options, settings and tools, using a drag-and-drop page builder tool to tweak and customize the individual pages.

### 2.4 Security

An encryption certificate has been obtained for the HERON project website to enable its operation over Hyper Text Transfer Protocol Secure (HTTPS). This is the secure version of HTTP, the protocol over which data is sent between the user’s browser and the website that the user is connected to. HTTPS adds encryption, authentication, and integrity to the HTTP protocol, making it much safer.

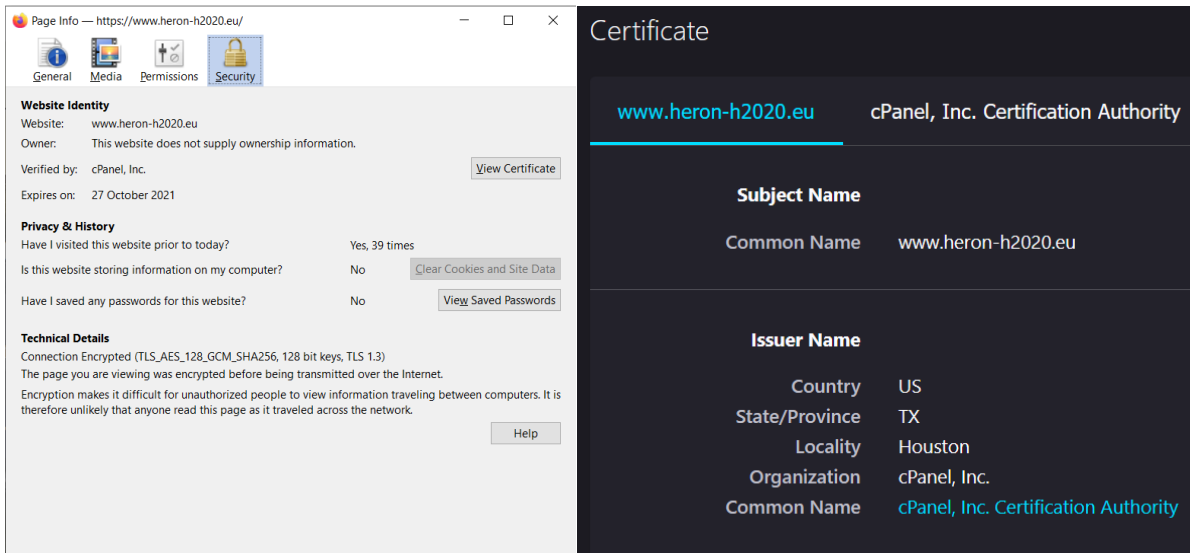


Figure 1: HERON HTTPS settings and security certificate.

### 3 HERON project website pages

We have followed a mixed presentation strategy utilizing both a “single page” layout that displays a first set of key project information, as well as a “multi-page” layout, via the menu for more specific thematic information relevant to the HERON project. The color scheme follows the basic color scheme of the HERON logo and the dissemination material of the whole project. The first version of the website contains the following pages:

- Home
- Project
- Consortium
- Latest News/Events
- Contact

On the top of each page, the HERON logo is present along with the main pages that the website visitor may access and the social media icons with the HERON project links.

The HERON project website is directly linked to the HERON project social media accounts (Facebook, LinkedIn, ResearchGate).

#### 3.1 Home

The homepage was designed on a cellphone-friendly “single page” layout basis, displaying a rich amount of information to the website visitors, in order to welcome them to the website and quickly introduce them to all of the main features of the project.

The home page describes the HERON’s main scope and objectives, it presents the project news, and displays the logos of the project partners, along with a continuously updated status of the all WPs.

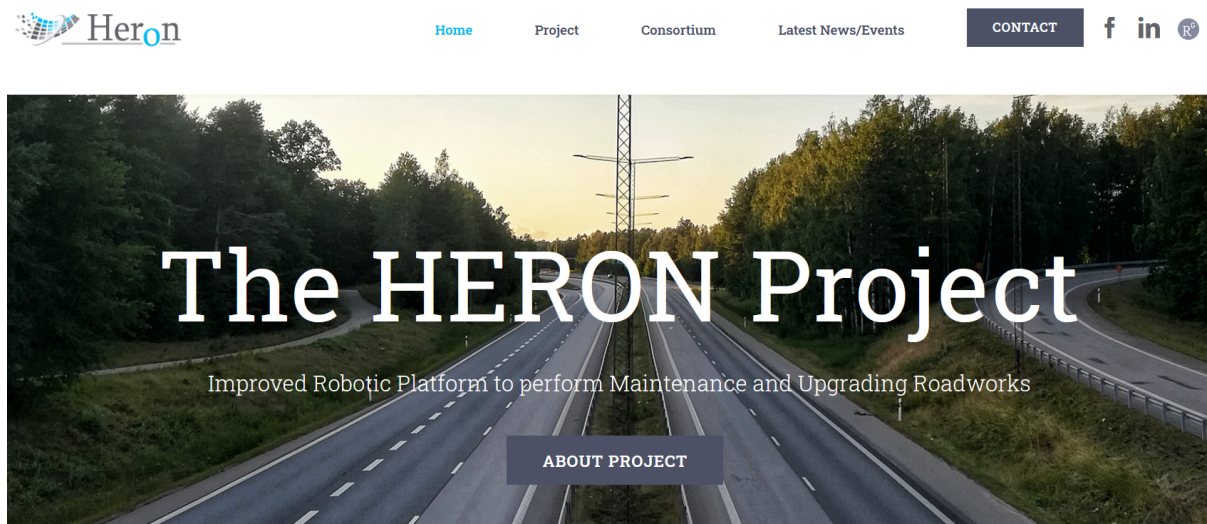


Figure 2: HERON home page – Top menu.

## Project Summary

HERON aims to develop an integrated automated system to perform maintenance and upgrading roadworks, such as sealing cracks, patching potholes, asphalt rejuvenation, autonomous replacement of CUD elements and painting markings, but also supporting the pre/post-intervention phase including visual inspections and dispensing and removing traffic cones in an automated and controlled manner.

Figure 3: HERON home page – Project summary.

## Project Partners



Figure 4: HERON home page – Project Partners (summarized).



Figure 5: HERON home page – WP progress (indicative).

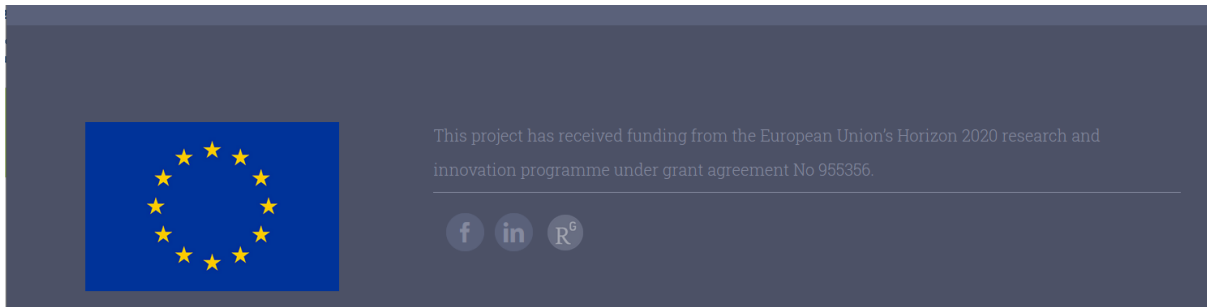


Figure 6: HERON home page – Footer.

## 3.2 Project

The “Project” page describes the HERON project, offering specialized sub-page parts to elaborate an extended summary, concept, objectives and pilots.

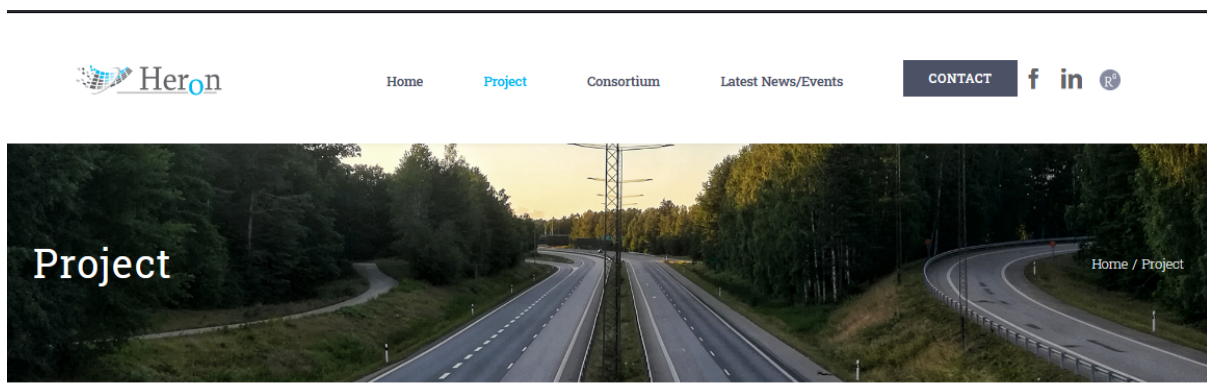


Figure 7: HERON Project page – Top menu.

## Project Summary

HERON aims to develop an integrated automated system to perform maintenance and upgrading roadworks, such as sealing cracks, patching potholes, asphalt rejuvenation, autonomous replacement of CUD elements and painting markings, but also supporting the pre/post-intervention phase including visual inspections and dispensing and removing traffic cones in an automated and controlled manner. The HERON system consists of:

- i) autonomous ground robotic vehicle that will be supported by autonomous drones to coordinate maintenance works and the pre-/post-intervention phase;
- ii) various robotic equipment, including sensors and actuators (e.g., tools for cut and fill, surface material placement and compaction, modular components installation, laser scanners for 3D mapping) placed on the main vehicle;
- iii) sensing interface installed both to the robotic platform and to the Road Infrastructures (RI) to allow improved monitoring (situational awareness) of the structural, functional and RI's and markings' conditions;
- iv) the control software that interconnects the sensing interface with the actuating robotic equipment;
- v) Augmented Reality (AR) visualization tools that enable the robotic system to see in detail surface defects and markings under survey;
- vi) Artificial Intelligence/AI-based toolkits that will act as the middleware of a twofold role for: a) optimally coordinating the road maintenance/upgrading workflows and b) intelligent processing of distributed data coming from the vehicle and the infrastructure sensors for safe operations and not disruption of other routine operations or traffic flows; and



Figure 8: HERON Project page – Project extended summary.



## Concept

The (semi-) automated HERON system relying on improved intelligent control of a multi-degree-of-freedom (MDOF) robotised vehicle, improved CV and AI/ML techniques combined with proper sensors, decision-making algorithms and AR components to perform corrective and preventive maintenance and upgrading of roadworks is considered an advanced solution, which pushes routine roadwork activities quite beyond the state-of-the-art. At the same time, by using advanced data coming from various sources (including V2I and aerial drone surveillance) and well-established methods (from existing know-how from research and industrial projects), the automated system will be able to provide some non-routine (emergency) maintenance operations when required. Towards that direction, HERON targets the development and prototype validation of an innovative, automated intelligent robotic platform for performing the above tasks safely, promptly, reliably and modularly.

Figure 9: HERON Project page – Concept.

## Objectives

HERON targets the following Scientific and Technical Objectives (STOs):

- + **STO-1: Develop an integrated robotic platform with increased navigation and positioning capabilities for maintenance and upgrading tasks and concurrent assessment of the RIS**
- + **STO-2: Provide an optimized control framework for developing and refining robotic manipulation skills required to perform assessment and maintenance and upgrading interventions of RI**
- + **STO-3: Integrate improved sensing and communication capabilities to the robotic platform in order to extract the required measurements in the identified areas of concern (e.g., poor or lack of markings, surface defects and potholes, dispensing and removing traffic cones, etc.) within an acceptable degree accuracy.**
- + **STO-4: Implement an AI toolkit enriched with image analysis modules to optimally coordinate the whole maintenance process and simultaneously process in a smart way the data from the sensing interface to take accurate and prompt decisions which can guarantee an unhindered execution of the traffic flow and a safe execution of routine maintenance works by the personnel.**
- + **STO-5: Design and develop proper communication architecture to support seamless and ubiquitous services among the various actors of the maintenance and upgrading operations (sensors, UGVs and drones).**
- + **STO-6: Implement an integrated Decision Support System (DSS) and an advanced Incident Management System (IMS) with interactive AR/VR visualization tools.**
- + **STO-7: Implement on-site integration, scaled-demonstration of the services and the technological components and validation of the HERON platform in three case studies (Greece, France and Spain).**



Figure 10: HERON Project page – Objectives (summarized “collapsed” view).

- + **STO-3: Integrate improved sensing and communication capabilities to the robotic platform in order to extract the required measurements in the identified areas of concern (e.g., poor or lack of markings, surface defects and potholes, dispensing and removing traffic cones, etc.) within an acceptable degree accuracy.**

In order to achieve a precise, automated maintenance and upgrading task, an accurate inspection of the PoI is needed, as well as wider knowledge of the surrounding area. This is done through the sensing interface installed on the robotic vehicle, the drones and on the RI. Surface 3D mapping and modelling<sup>5</sup> are some of the salient parts of HERON sensors aiming at extracting precise details on 3D geometry of a road defect and thus stimulate the proper control mechanisms for its repair or the activation of pre-fabricated solutions (such as the Demountable Urban Roadway -CUD-elements) to modularize the planning and accelerate the maintenance and upgrading tasks. CV tools will be applied towards a traffic management for a safe flow and working conditions of the maintenance personnel (access to PANOPTIS outcomes<sup>2</sup>). Regarding the communication tools, HERON will support any module (e.g., 4G/5G, WiMAX, BLE4, etc.) that will be integrated into the robotic vehicle (as in STO-5), allowing the robotised vehicle(s) to have different configurations for communicating to the each other, the field maintenance team and the control center.

- + **STO-5: Design and develop proper communication architecture to support seamless and ubiquitous services among the various actors of the maintenance and upgrading operations (sensors, UGVs and drones).**
- + **STO-6: Implement an integrated Decision Support System (DSS) and an advanced Incident Management System (IMS) with interactive AR/VR visualization tools.**
- + **STO-7: Implement on-site integration, scaled-demonstration of the services and the technological components and validation of the HERON platform in three case studies (Greece, France and Spain).**

Figure 11: HERON Project page – Objectives (extended view of STO-3).




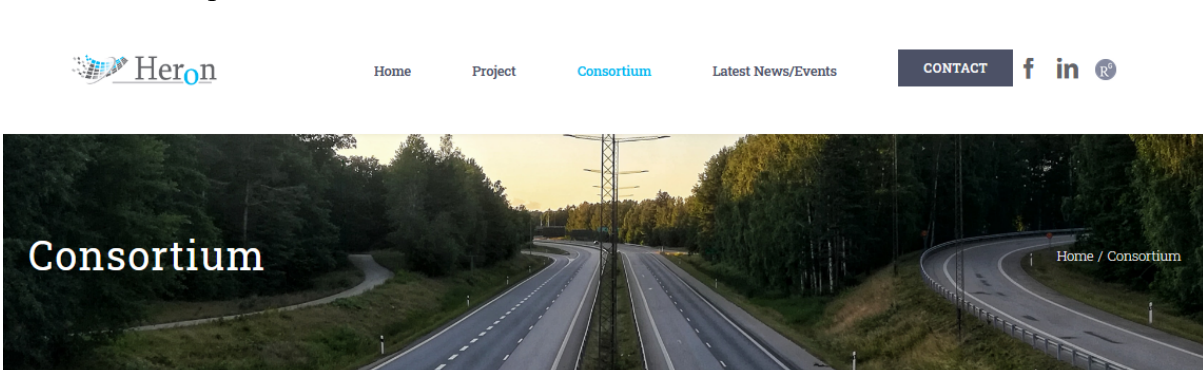
 <h3>Pilot 1</h3> <p>The pilot will be deployed in the A2 Motorway stretch maintained by the company (R2-CM42 stretch, coming from Madrid, and finishing in the limit between the provinces of Guadalajara and Soria, Spain), and in the traffic control centre of the stretch located near the village of Torija. The motorway is owned by the Spanish National Road Authority and the section selected has a length of 77.5 km. The section has 4 lanes (2 per traffic direction) and crosses a region with Continental-Mediterranean climate, with long and severe winters, long, dry and hot summers and high heavy traffic levels, so pavement is exposed to severe requirements and maintenance is crucial to preserve the optimum pavement conditions required. A2 is one of the main motorways in Spain, connecting Madrid with Barcelona, it is part of the Trans-European Transport Network (TEN-T) and the CEF corridor.</p>	 <h3>Pilot 2</h3> <p>Transpolis is a proving ground of more than 80ha, which has been created by 5 entities among which UGE and which has been opened officially in 2019. It is typically used to test autonomous vehicles in a secure and controlled environment, also by assessing the V2I communication possibilities (several types of Road-Side-Units- RSUs- and communication means) are already installed on site. It also is composed of several kilometers of road and all reinforced concrete buildings. Many types of V2X and I2V (Infrastructure to Vehicle) communication means are available, as well as camera monitoring, all of them will be used during the HERON activities.</p>	 <h3>Pilot 3</h3> <p>OLO has undertaken the traffic management and routine maintenance of the Elefsina-Korinthos-Patra motorway (in the heart of the Greek highway networks), which has 202 km total length and includes more than 25 km tunnels and a large number of bridges, culverts and ancillary structures. It includes corrective and preventive maintenance both of civil works equipment and Early Equipment Management (EEM) of open road and tunnels. OLO will provide a part of the motorway, where extensive tests of the automated vehicle can take place, issuing the necessary permits in cooperation with the relevant Authorities (Public Service and Traffic Police) and ensuring safety conditions both for the road users and the people working for the project. The area that will be examined during the pilot program is the ELKO section, which is a dual carriageway with three lanes (3.5m width left lane, 3.75m width middle and right lane) and emergency lane (varies from 2.5 to 3.5m) per direction with concrete New Jersey safety barriers in the central axis of the</p>
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Figure 12: HERON Project page – Pilots.

### 3.3 Consortium

The “About” page provides details on the HERON project partners along with their logos and links to their respective websites.



The screenshot shows the top navigation menu of the HERON Consortium website. The menu includes: Home, Project, Consortium (highlighted in blue), and Latest News/Events. A dark blue 'CONTACT' button is positioned to the right of the menu, followed by social media icons for Facebook, LinkedIn, and YouTube. Below the menu is a large banner image of a road winding through a forest at sunset, with the word 'Consortium' overlaid in white text on the left and 'Home / Consortium' in the bottom right corner.

Figure 13: HERON Consortium page – Top menu.



### Short Description

The Institute of Communications and Computer Systems (ICCS) is a non-profit academic research body established in 1989 by the Greek Ministry of Education to carry out research and development activities in the area of telecommunications, systems and techniques, computer systems and their applications in transceivers, radar, electromagnetic sensors, satellite and wireless communications, electromagnetic phenomena modelling, neural networks, systems, software and hardware engineering, telematics and multimedia applications, transport applications, control systems, biomedical engineering and electric power ([www.iccs.gr](http://www.iccs.gr)). It is closely associated with the School of Electrical and Computer Engineering (SECE) of the National Technical University of Athens (NTUA) (est. 1837), which is the oldest and most prestigious academic institute in Greece. The personnel of ICCS consists of academic staff (~80 University Professors), 40 senior researchers and more than 500 researchers (including PhD students) in twenty research laboratories.

[iccs.gr](http://iccs.gr)



### Short Description

Acciona Construcción is a leading European construction company designing, constructing and managing buildings and civil infrastructures under sustainability principles. It has an international presence in more than 30 countries and total revenues of 3,137m€ (2018), employing more than 11,000 people. It is part of Acciona Group whose business lines are Energy, Construction, Water & Services. Acciona has its own R&D Technological Centre in Madrid (<https://www.acciona-construccion.com/innovation/>), composed by a multidisciplinary and international team of more than 100 highly qualified researchers from a wide range of disciplines. Main research areas are Sustainable Buildings, Materials (Concrete, New Materials), Construction Processes (Roads, Railways and Tunnels, Maritime Works and Structures), and Digital Innovation.

[acciona-construccion.com](http://acciona-construccion.com)

Figure 14: HERON Consortium page – Partner Descriptions.

## Funding

### Cinea

#### Short Description

The European Climate, Environment and Infrastructure Executive Agency (CINEA) is the successor organisation of the Innovation and Networks Executive Agency (INEA). Officially established on 15 February 2021, it has started its activities on 1 April 2021 in order to implement parts of certain EU programmes.

CINEA plays a key role in supporting the EU Green Deal through the efficient and effective implementation of its delegated programmes.

It is a dynamic and innovative working place, where professional and experienced staff feel empowered and committed to achieve the organisation's mission and strategic objectives.

The Agency fosters an efficient knowledge sharing and synergies between its different programmes and establishes strong partnerships with its stakeholders.

[cinea.ec.europa.eu](http://cinea.ec.europa.eu)

Figure 15: HERON Consortium page – Funding Agency Description.

### 3.4 Latest News / Events

The “Latest News / Events” page is the main section where all relative project content will be disseminated, following a chronological hierarchy and a “blog” layout.

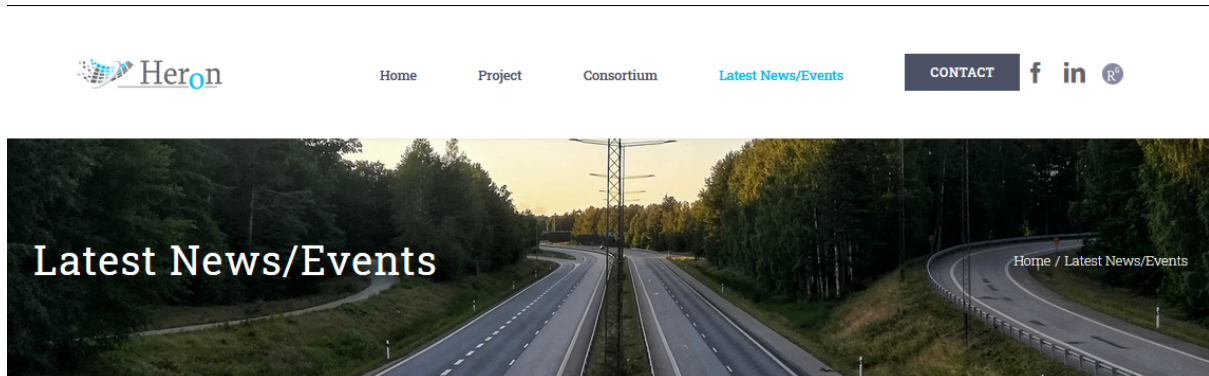


Figure 16: HERON Latest News / Events page – Top menu.

## Latest News / Events

Latest News and Events of Heron Project



**Heron is alive and kicking**

Figure 17: HERON Latest News / Events page – Blog summary.

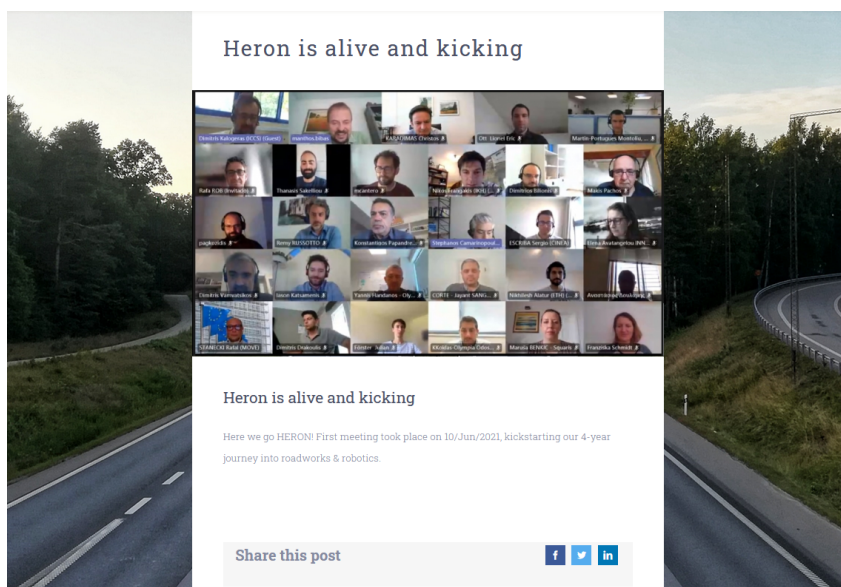


Figure 18: HERON Latest News / Events page – Blog post.

### 3.5 Contact

The “Contact” page offers to the visitors the opportunity to reach out and contact the project partners by means of e-mail, or social media. Moreover, it lists the details of the project coordinator, for direct contact.

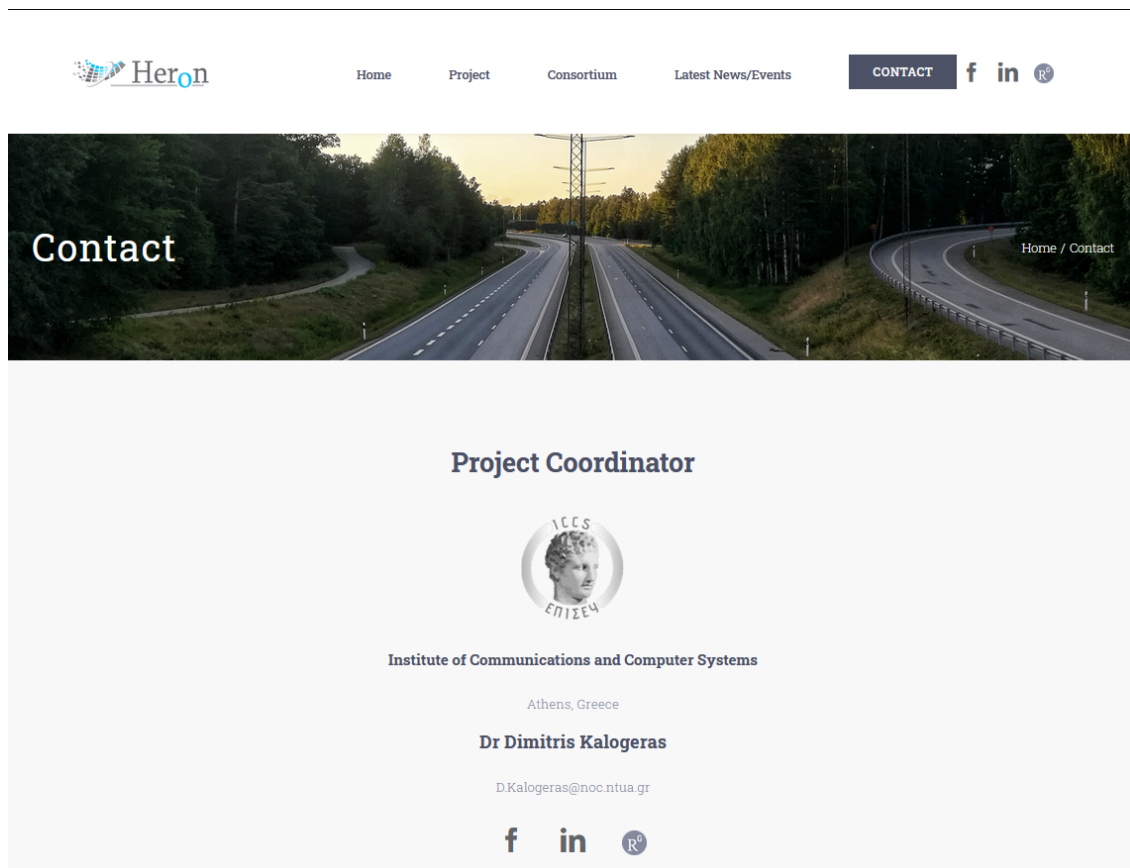


Figure 19: HERON Contact page.

## 4 Conclusions

Deliverable D8.2, namely “Project Website”, which was developed within the Work Package 8 “High-Impact Communication and Dissemination Activities”, by the responsible partner ResilienceGuard GmbH, aims to deliver and describe the HERON project website, which has been designed and implemented in order to act as the main dissemination project tool towards the target audiences.

The website content will be continuously updated as the project implementation progresses, and new categories (such as publications, public deliverables etc.) will be added respectively. The news section contains a dynamic content that will be directly linked to the projects’ social media channels (i.e. Facebook, LinkedIn, and ResearchGate) thus creating awareness, as well as increasing interactivity. All major project activities, such as meetings, workshops and events, as well as project results, will be documented and presented to the website visitors, enhancing the project’s visibility. Finally, we will regularly track and monitor the usage of the website content by utilizing the “Google Analytics” tool, which has been installed throughout our content management system.

## References

- [1] IPGLOBAL IKE, Web hosting solutions. URL: <https://www.ip.gr/en/>
- [2] WordPress Content Management System. URL: <https://WordPress.org/>
- [3] ThemeFusion, Avada Theme for Wordpress. URL: <https://avada.theme-fusion.com/>