



## HEIDI Y3 exploitation, sustainability, and standardisation activities

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## Change History

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1.0	2025-07-03	TREE, All partners	First draft – contributions from partners coming from questionnaires.
2.0	2025-07-16	TREE	Draft version for revision by partners.
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2.2	2025-08-15	TREE	Reviewers' comments addressed.
3.0	2025-08-27	TREE, VIF	Final version for internal quality check and submission.

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## 1. Executive Summary

The present deliverable describes year three (Y3) of HEIDI's exploitation and sustainability work carried out under the framework of Task 8.2, led by TREE, towards exploitation and sustainability of the project's results after the end of the grant. This includes an update of the HEIDI exploitation table presented in deliverable 8.3 in M6 with a previous update in M12 after Y1 activities and M24 after Y2 activities. The deliverable also aims to provide a description of the HEIDI exploitation pathway, with the final exploitation roadmaps and actions per KER, and business strategy, as envisioned by consortium partners after three years of HEIDI activities.

The structure of the main sections of the deliverable is the following:

Section 3 presents the exploitation pathway defined by HEIDI partners for each KER, depending on their involvement during project activities. The characterisation, the exploitation analysis (presented in D8.8), the exploitation roadmap and the corresponding exploitation route of each KER is presented.

Section 3.9 aims to provide the information related to agreements and for KER 3, KER 4 and KER 7, where the exploitation plans from partners involved needed some agreements. These agreements are retained by the coordinator in HEIDI's records for reference.

Section 4 presents an update of the Business Model Canvas (previously presented in D8.7) based on the information collected through the exploitation questionnaires (ANNEX I), the exploitation pathway and discussions with partners.

Finally, section 5 presents an update of the HEIDI exploitation table after the completion of Y3 activities.

**Keywords:** exploitation, business strategy, agreements, exploitation pathway.

## 2. Objectives

The primary objective of deliverable 8.9 is to report about the year three (Y3) exploitation and sustainability activities of HEIDI outcomes. As part of WP8, this objective complements HEIDI's main objectives 1 and 4 related to the development and demonstration of fluid, cooperative Human Machine Interface (HMI) solutions, the elaboration of recommendations for regulation, standardisation, and development of adaptive internal and external HMIs, respectively.

To reach this objective, first we have prepared a questionnaire (see ANNEX I) to collect information from the partners about the exploitation route per KER and the roadmap to be followed by the end of project activities. The questionnaire aim is to help partners to put together a plan and estimation of the exploitation path each one of the HEIDI's outcomes will have after the end of the project. Additionally, exploitation agreements were revised and signed based on the information collected from the questionnaire.

Secondly, we have updated the Business Model Canvas with the updated information coming from the final exploitation paths for each KER and partners intentions regarding exploitation of their outcomes. The information also served to create the final HEIDI exploitation table after the completion of project activities, where information about the background, the exploitation interests, and results protection is summarised.

The current document is the last report of HEIDI's exploitation activities and sustainability plan and will present the final work conducted under WP8 during Y3 of the HEIDI project.

### 3. HEIDI Exploitation pathway

This section presents the exploitation roadmap of each HEIDI KER, including the characterisation, the exploitation analysis (presented in D8.8), the exploitation roadmap and the corresponding exploitation route. The information was collected from HEIDI partners through a questionnaire (see ANNEX I) where instructions were provided to complete the tables. Discussions between partners that share developments/knowledge, etc. within a KER were encouraged to deliver the final information.

This form is the first step of the definition of final exploitation strategy, a questionnaire through which they had the last opportunity to update the exploitation modality of the result to which they contribute.

#### 3.1 KER 1 – Osmotic Layer

KER 1 - Osmotic Layer (BMW, NISYS)	
<i>Application Programming Interface (API) for the transmission of information via wireless connection between the vehicle and the outside world.</i>	
<b>Commercial exploitation? Sustainable exploitation?</b>	Long term: Yes. 2029+
<b>Exploitation goal</b> (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Non-commercial: internal use.
<b>Exploitation Model</b>	<ul style="list-style-type: none"> <li>• Prototype development, Cloud Computing.</li> <li>• Scientific publications and a proof of concept of the product.</li> </ul>
<b>Main external stake holders (see Annex II for reference)</b>	A, B, D, E, F
<b>Access rights to results or joint exploitation</b> (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	<p>Access rights to background if needed for exploitation of another party's own results shall be granted on fair and reasonable conditions.</p> <p>Access rights to results are granted on reasonable terms if they are necessary for another party's own results.</p>

KER 1 Exploitation route			
Selected route		Implementing actor	Yes
<b>DIRECT USE</b>	Commercialisation: <i>deployment of a novel product/service (offered to the target markets)</i>	One partner	
		A group of partners	
	Contract research ( <i>new contracts signed by the research group with external clients</i> )	A partner	
		A group of partners	
	A new research project ( <i>application to public funded research programmes</i> )	A partner	
		A group of partners	X

	Implementation of a new course ( <i>Note that a training course is a service</i> )	A partner	
		A group of partners	
		A new partnership	
INDIRECT USE	Assignment of the IPR	A partner	
		A group of partners	
	Licensing of the IPR	A partner	
		A group of partners	
	Development of a new legislation/standard	A partner	
		A group of partners	
	Spin-off	A partner	
		A group of partners	
By assignment			
	By licensing		
	Other ( <i>please describe</i> )		

KER 1 Exploitation roadmap	
<b>Actions*</b>	A subset of the results of HEIDI will be used to write the application for another EU call (HORIZON-CL5-2025-01-D6-11), which is addressed by the project SafeADapt.
<b>Roles*</b>	Participant of EU funded project SafeADapt* (application phase started)
<b>Milestones*</b>	09/25 application to be submitted
<b>Financials Costs</b>	TBD
<b>Revenues</b>	N/A
<b>Other sources of coverage</b>	Own resources
<b>Impact in 3-year time*</b>	N/A

### 3.2 KER 2 – Fluid internal HMI

KER 2 – Fluid internal HMI (iHMI) (BMW, NISYS, VIF)	
<i>Concept for adaptive vehicle interface based on driver's state monitoring.</i>	
<b>Commercial exploitation? Sustainable exploitation?</b>	Long term: Yes. 2029+
<b>Exploitation goal</b> (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Non-commercial: knowledge acquisition.
<b>Exploitation Model</b>	Network-based, media dissemination, research contribution to R&D projects and services.
<b>Main external stake holders</b> (see Annex II for reference)	A, B, D, E
<b>Access rights to results or joint exploitation</b>	Access right to the background knowledge of other parties not envisioned.

(e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Access rights to results are granted on reasonable terms if they are necessary for another party's own results.
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KER 2 Exploitation route			
Selected route		Implementing actor	Yes
DIRECT USE	Commercialisation: <i>deployment of a novel product/service (offered to the target markets)</i>	One partner	
		A group of partners	
	Contract research ( <i>new contracts signed by the research group with external clients</i> )	A partner	
		A group of partners	
	A new research project ( <i>application to public funded research programmes</i> )	A partner	
		A group of partners	X
Implementation of a new course ( <i>Note that a training course is a service</i> )	A partner		
	A group of partners		
	A new partnership		
INDIRECT USE	Assignment of the IPR	A partner	
		A group of partners	
	Licensing of the IPR	A partner	
		A group of partners	
	Development of a new legislation/standard	A partner	
		A group of partners	
	Spin-off	A partner	
		A group of partners	
By assignment			
	By licensing		
	Other ( <i>please describe</i> )		

KER 2 Exploitation roadmap	
<b>Actions*</b>	A subset of the results of HEIDI will be used to write the application for another EU call (HORIZON-CL5-2025-01-D6-11), which is addressed by the project SafeADapt.
<b>Roles*</b>	Participant of EU funded project SafeADapt* (application phase started)
<b>Milestones*</b>	09/25 application to be send
<b>Financials Costs</b>	TBD
<b>Revenues</b>	N/A
<b>Other sources of coverage</b>	Own resources
<b>Impact in 3-year time*</b>	N/A

### 3.3 KER 3 – Fluid external HMI

<b>KER 3 - Fluid external HMI (eHMI) (MAR, RUAS, UAH)</b>	
<i>An external HMI which can react adaptively to the different road users and will communicate to many groups (or only specifically one person out of a group) and may present more information.</i>	
<b>Commercial exploitation? Sustainable exploitation?</b>	Internal exploitation to support our current research lines. Partners will exploit in a sustainable way HEIDI results to foster research along its research line and are committed to sustainable development of products, considering eco-friendly materials, energy efficient designs and possibility to repair products.
<b>Exploitation goal</b> (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Commercial internal.
<b>Exploitation Model</b>	<ul style="list-style-type: none"> <li>• New scientific research with partners and similar stakeholders will be steered by the outcome and insights of the project.</li> <li>• eHMIs of different complexity are established in the market as a Lighting product enhancing road user safety. Thus, they become a sought-after part of MAR product portfolio.</li> <li>• Leverage the developed knowledge to support further research applications and PhD Theses.</li> </ul>
<b>Main external stake holders (see Annex II for reference)</b>	A, B, C, D, E, F.
<b>Access rights to results or joint exploitation</b> (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Joint research development and access to results from partners will be analysed for exploitation.

<b>KER 3 Exploitation route</b>				
		<b>Selected route</b>	<b>Implementing actor</b>	<b>Yes</b>
<b>DIRECT USE</b>	Commercialisation: <i>deployment of a novel product/service (offered to the target markets)</i>	A partner: MAR offer to customers worldwide		X
		A group of partners		
	Contract research ( <i>new contracts signed by the research group with external clients</i> )	A partner		
		A group of partners		
	A new research project ( <i>application to public funded research programmes</i> )	A partner		
		A group of partners		
		A partner		
	Implementation of a new course ( <i>Note that a training course is a service</i> )	A group of partners		
		A new partnership		

<b>INDIRECT USE</b>	Assignment of the IPR	A partner	
		A group of partners	
	Licensing of the IPR	A partner	
		A group of partners	
	Development of a new legislation/standard	A partner	
		A group of partners	
	Spin-off	A partner	
		A group of partners	
		By assignment	
		By licensing	
	Other ( <i>please describe</i> )		

<b>KER 3 Exploitation roadmap</b>	
<b>Actions*</b>	<b>MAR:</b> Develop a technical product acting as eHMI as part of exterior automotive front lighting – when and if active communication via displays is allowed by regulations.
<b>Roles*</b>	<b>MAR</b> will be developer and manufacturer of physical products.
<b>Milestones*</b>	<b>MAR:</b> Such products need to be implemented in global legal regulations for use in traffic
<b>Financials Costs</b>	Not applicable at the moment
<b>Revenues</b>	Not applicable at the moment
<b>Other sources of coverage</b>	Not applicable at the moment. <b>MAR:</b> Will be part of industrialisation processes (i.e. development, manufacture, etc.)
<b>Impact in 3-year time*</b>	<b>MAR:</b> Time until regulatory approval is expected to exceed 3 years. First product SOP presumably 2030 – if successful

### 3.4 KER 4 – Integrated cooperative HMI with situation assessment, resolution, and decision module

<b>KER 4 – Integrated cooperative HMI with situation assessment, resolution, and decision module (VTI, RUAS, HRI-EU, VIF)</b>	
<i>Software system providing recommendation of optimal coordinated behaviour for driver and outside participants via iHMI and eHMI.</i>	
<b>Commercial exploitation?</b>	No.
<b>Sustainable exploitation?</b>	Focus on further challenging research aspects.
<b>Exploitation goal</b> (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Non-commercial. To be included in further research services, raise interest of related entity towards the project itself but also towards the developed technologies; Leverage the developed knowledge to support further research applications.
<b>Exploitation Model</b>	<ul style="list-style-type: none"> <li>Exploit new research insights in novel ways, to support new opportunities for PhD thesis and projects.</li> <li>Scientific publications and a proof of concept of the application.</li> </ul>
<b>Main external stake holders (see Annex II for reference)</b>	A, B, D, E and F.

<p><b>Access rights to results or joint exploitation</b> (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)</p>	<ul style="list-style-type: none"> <li>• Joint further exploitation of research.</li> <li>• Access rights to background if needed for exploitation of another party's own results shall be granted on fair and reasonable conditions.</li> </ul>
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KER 4 Exploitation route			
Selected route		Implementing actor	Yes
DIRECT USE	Commercialisation: <i>deployment of a novel product/service (offered to the target markets)</i>	One partner	
		A group of partners	
	Contract research ( <i>new contracts signed by the research group with external clients</i> )	A partner	
		A group of partners	
	A new research project ( <i>application to public funded research programmes</i> )	A partner	
		A group of partners	
	Implementation of a new course ( <i>Note that a training course is a service</i> )	A partner	
A group of partners			
A new partnership			
INDIRECT USE	Assignment of the IPR	A partner	X
		A group of partners	
	Licensing of the IPR	A partner	
		A group of partners	
	Development of a new legislation/standard	A partner	
		A group of partners	
	Spin-off	A partner	
		A group of partners	
By assignment			
	By licensing		
	Other ( <i>please describe</i> )		

KER 4 Exploitation roadmap	
<b>Actions*</b>	Presentation of final results to affiliated R&D departments
<b>Roles*</b>	Preparation of material for presentation (HRI-EU)
<b>Milestones*</b>	R&D department confirms interest in product development for this IP
<b>Financials Costs</b>	N/A
<b>Revenues</b>	N/A
<b>Other sources of coverage</b>	N/A
<b>Impact in 3-year time*</b>	Reaching sufficiently high TRL to consider making a product

### 3.5 KER 5 – Situation resolution and tracking module

<b>KER 5 – Situation resolution and tracking module (HRI-EU)</b>	
<i>Algorithm that continuously evaluates behaviour of driver and outside participants, compares it to a recommended best joint behaviour and communicates deviations and criticality of deviations.</i>	
<b>Commercial exploitation? Sustainable exploitation?</b>	No
<b>Exploitation goal</b> (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Non-commercial - raise interest of related entity towards the project itself but also towards the developed technologies; Leverage the developed knowledge to support further research applications.
<b>Exploitation Model</b>	<ul style="list-style-type: none"> <li>Scientific publications and a proof of concept of the application.</li> </ul>
<b>Main external stake holders (see Annex II for reference)</b>	A, B and D.
<b>Access rights to results or joint exploitation</b> (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Access rights to background if needed for exploitation of another party's own results shall be granted on fair and reasonable conditions.

\* HRI-EU does not envisage further exploitation plans (no route and roadmap).

### 3.6 KER 6 – Sensing & behavioural predictive models for ego-driver

<b>KER 6 – Sensing &amp; behavioural predictive models for ego-driver (VIF, UAH)</b>	
<i>Algorithms that detect driver's distraction and predict driver's intentions.</i>	
<b>Commercial exploitation? Sustainable exploitation?</b>	Internal exploitation to support our current research lines.
<b>Exploitation goal</b> (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Non-commercial. To be included in further research services, raise interest of related entity towards the project itself but also towards the developed technologies; Leverage the developed knowledge to support further research applications.
<b>Exploitation Model</b>	Leverage the developed knowledge to support further research applications and PhD Theses.
<b>Main external stake holders (see Annex II for reference)</b>	D and E.
<b>Access rights to results or joint exploitation</b> (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Joint further exploitation of research and technology between VIF and UAH.

KER 6 Exploitation route			
Selected route		Implementing actor	Yes
DIRECT USE	Commercialisation: <i>deployment of a novel product/service (offered to the target markets)</i>	One partner	
		A group of partners	
	Contract research ( <i>new contracts signed by the research group with external clients</i> )	A partner	
		A group of partners	
	A new research project ( <i>application to public funded research programmes</i> )	A partner	
		A group of partners	X
	Implementation of a new course ( <i>Note that a training course is a service</i> )	A partner	
		A group of partners	
A new partnership			
INDIRECT USE	Assignment of the IPR	A partner	
		A group of partners	
	Licensing of the IPR	A partner	
		A group of partners	
	Development of a new legislation/standard	A partner	
		A group of partners	
	Spin-off	A partner	
		A group of partners	
By assignment			
	By licensing		
	Other ( <i>please describe</i> )		

KER 6 Exploitation roadmap	
<b>Actions*</b>	Revision of exploitation plan and evaluation of inclusion in innovation actions
<b>Roles*</b>	Discussion with partners for features standardization and adoption framework
<b>Milestones*</b>	Inclusion in innovation action 6 months after the project
<b>Financials Costs</b>	N/A
<b>Revenues</b>	N/A
<b>Other sources of coverage</b>	N/A
<b>Impact in 3-year time*</b>	Technology readiness level 7

### 3.7 KER 7 – Sensing & behavioural predictive models for pedestrians

KER 7 – Sensing & behavioural predictive models for pedestrians (RUAS, UAH)	
<i>Recognition of adult pedestrians and children pedestrians; recognition of pedestrian behavioural features and prediction of most likely future behaviours.</i>	
<b>Commercial exploitation?</b> <b>Sustainable exploitation?</b>	No, only internal exploitation to support our current research lines.
<b>Exploitation goal</b>	Non-commercial, Internal.

(e.g. Non-commercial; Commercial, Internal; or Commercial, External)	
<b>Exploitation Model</b>	Leverage the developed knowledge to support further research applications and PhD Theses.
<b>Main external stake holders (see Annex II for reference)</b>	D and E.
<b>Access rights to results or joint exploitation</b> (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Joint research development between RUAS and UAH.

<b>KER 7 Exploitation route</b>			
<b>Selected route</b>		<b>Implementing actor</b>	<b>Yes</b>
<b>DIRECT USE</b>	Commercialisation: <i>deployment of a novel product/service (offered to the target markets)</i>	One partner	
		A group of partners	
	Contract research ( <i>new contracts signed by the research group with external clients</i> )	A partner: UAH	X
		A group of partners	
	A new research project ( <i>application to public funded research programmes</i> )	A partner: RUAS is planning to use plausible deep uncertainty modelling to challenging high-dimensional machine learning problems	X
		A group of partners	
	Implementation of a new course ( <i>Note that a training course is a service</i> )	A partner: UAH	X
		A group of partners	
A new partnership			
<b>INDIRECT USE</b>	Assignment of the IPR	A partner	
		A group of partners	
	Licensing of the IPR	A partner	
		A group of partners	
	Development of a new legislation/standard	A partner	
		A group of partners	
	Spin-off	A partner	
		A group of partners	
By assignment			
	By licensing		
	Other ( <i>please describe</i> )		

<b>KER 7 Exploitation roadmap</b>	
<b>Actions*</b>	<p><b>RUAS:</b> Develop deep uncertainty modelling techniques for demanding vision tasks tailored to dynamic, safety-critical contexts in automotive, robotics, and HMI.</p> <p><b>UAH:</b> (i) Research contract with OEM to implement a behaviour prediction system for pedestrians' crossing intentions; (ii) Research contract with OEM to extend the behaviour prediction capabilities to more complex scenarios, including roundabouts and intersections.</p>
<b>Roles*</b>	<p><b>RUAS</b> continues developments and exploiting results in publications with public releases of code; domain partners could validate in real-world learning scenarios; policy-aware partners could align outputs with emerging EU AI standards and regulations.</p> <p><b>UAH</b> will provide research and innovation services in the previously mentioned research contracts with OEM.</p>
<b>Milestones*</b>	<p><b>RUAS:</b> After an initial phase of developing adapted methods (year 1), demonstrating on challenging automotive or robotics datasets (year 2), the developments could contribute to standardization efforts and contributions in further EU research project proposals (year 3).</p> <p><b>UAH:</b> 1 year: implementation of behaviour prediction system with OEM. 3 years: development of research activities to extend the operational driving domain of prediction features to roundabouts and intersections.</p>
<b>Financials Costs</b>	<b>UAH:</b> Software development: 30k €
<b>Revenues</b>	<p><b>UAH:</b> Services (updates and validation of new scenarios): 20k € per service.</p> <p>Revenue after 1 year: 0.</p> <p>Revenue after 3 years: 60k €.</p>
<b>Other sources of coverage</b>	<b>UAH:</b> Own resources and other project grants.
<b>Impact in 3-year time*</b>	<p><b>RUAS:</b> Enable more trustworthy, uncertainty-aware AI systems that support future research and inform EU policy and standardization in human-centric autonomous technologies.</p> <p><b>UAH:</b> Behaviour prediction system included as additional feature in ADAS of European OEM, thus contributing to increasing the social acceptance of automated vehicles by optimizing the interactions with pedestrians.</p>

### 3.8 KER 8 – Unique multi-user simulation with driver and pedestrians (co-simulation)

<b>KER 8 – Unique multi-user simulation with driver and pedestrians (co-simulation) (VTI, RUAS, HRI-EU)</b>	
<i>Networked driving and pedestrian simulators of multi-user experiments.</i>	
<b>Commercial exploitation?</b> <b>Sustainable exploitation?</b>	No, focus on further challenging research aspects.

<b>Exploitation goal</b> (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Non-commercial - Leverage the developed knowledge to support further research applications.
<b>Exploitation Model</b>	Exploit new research insights in novel ways, to support new opportunities for PhD thesis projects and technology advancements.
<b>Main external stake holders (see Annex II for reference)</b>	D and E.
<b>Access rights to results or joint exploitation</b> (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Joint further exploitation of research and technology between RUAS, VTI and HRI-EU.

KER 8 Exploitation route			
Selected route		Implementing actor	Yes
DIRECT USE	Commercialisation: <i>deployment of a novel product/service (offered to the target markets)</i>	One partner	
		A group of partners	
	Contract research ( <i>new contracts signed by the research group with external clients</i> )	A partner	X
		A group of partners	
	A new research project ( <i>application to public funded research programmes</i> )	A partner	X
		A group of partners	X
	Implementation of a new course ( <i>Note that a training course is a service</i> )	A partner	
A group of partners			
A new partnership			
INDIRECT USE	Assignment of the IPR	A partner	
		A group of partners	
	Licensing of the IPR	A partner	
		A group of partners	
	Development of a new legislation/standard	A partner	
		A group of partners	
	Spin-off	A partner	
		A group of partners	
By assignment			
By licensing			
Other ( <i>please describe</i> )			

KER 8 Exploitation roadmap	
<b>Actions*</b>	Further develop the multi-user simulation by integrating additional interactive road users (drivers, bicyclists, pedestrians) and allowing more flexible coupling of simulators (e.g. two simulators of the same transport type).

<b>Roles*</b>	Researchers at VTI responsible for the work, possibly in collaboration with partners within future research projects.
<b>Milestones*</b>	Flexible integration with other simulators: 1 year after the end of the project. Research studies running with adapted scenarios implemented: 1 year from the end of the project (if project funding is granted)
<b>Financials Costs</b>	Development costs: 100k €
<b>Revenues</b>	N/A
<b>Other sources of coverage</b>	Funding through research grants from external funding sources, governmental research funding bodies, and internal project grants.
<b>Impact in 3-year time*</b>	Availability of a research platform with the possibility to, in a safe and standardized manner, study complex multi-user interactions in safety critical traffic situations.

### 3.9 KER 9 – Standardisation, ethical guidelines, and human-centred methodology

<b>KER 9 – Standardisation, ethical guidelines, and human-centred methodology (ALL)</b>	
<i>Networked driving and pedestrian simulators of multi-user experiments.</i>	
<b>Commercial exploitation? Sustainable exploitation?</b>	Standardisation drafts which will hopefully lead to regulation are the prerequisite.
<b>Exploitation goal</b> (e.g. Non-commercial; Commercial, Internal; or Commercial, External)	Non-commercial - public
<b>Exploitation Model</b>	Public exploitation through standardisation bodies.
<b>Main external stake holders</b> (see Annex II for reference)	C, D, E.
<b>Access rights to results or joint exploitation</b> (e.g., transfer of your results; access to another partner's result; joint exploitation; or no access will be provided)	Standardisation must be public.

<b>KER 9 Exploitation route</b>			
<b>Selected route</b>		<b>Implementing actor</b>	<b>Yes</b>
<b>DIRECT USE</b>	Commercialisation: <i>deployment of a novel product/service (offered to the target markets)</i>	One partner	
		A group of partners	
	Contract research ( <i>new contracts signed by the research group with external clients</i> )	A partner	
		A group of partners	
	A new research project ( <i>application to public funded research programmes</i> )	A partner	
		A group of partners	

	Implementation of a new course ( <i>Note that a training course is a service</i> )	A partner	
		A group of partners	
		A new partnership	
INDIRECT USE	Assignment of the IPR	A partner	
		A group of partners	
	Licensing of the IPR	A partner	
		A group of partners	
	Development of a new legislation/standard	A partner: MAR to give input in GTB; GRE	X
		A group of partners	
	Spin-off	A partner	
		A group of partners	
		By assignment	
By licensing			
	Other ( <i>please describe</i> )		

KER 9 Exploitation roadmap	
<b>Actions*</b>	Introduce deliverables regarding recommendations for regulations and standardization to parties involved in the decision-making process, e.g. GTB, GRE
<b>Roles*</b>	MAR will facilitate awareness and support the respective groups.
<b>Milestones*</b>	Discussion in GTB, GRE
<b>Financials Costs</b>	N/A
<b>Revenues</b>	N/A
<b>Other sources of coverage</b>	N/A
<b>Impact in 3-year time*</b>	Discussions in regulatory organizations ongoing w/ a time frame for expected implementation in regulations

The partners share a unified vision for the exploitation of the KERs, combining non-commercial research ambitions with targeted commercial applications. The majority of KERs are oriented towards **non-commercial use, focusing on scientific advancement, knowledge dissemination, and the generation of new research opportunities**. Common exploitation routes include participation in future public-funded research projects, development of scientific publications, and support for PhD theses and academic initiatives.

KER 4 and KER 7, for example, illustrate the value of non-commercial internal use. KER 4 aims to stimulate interest among research entities and leverage insights for future research services and PhD work. KER 7 combines several exploitation paths—including contract research, new research projects, and the implementation of a training course—demonstrating a multifaceted approach that blends academic, educational, and applied research objectives.

For the commercially viable KERs—such as KER 3—the strategy includes service offerings, prototype and product development, and market deployment, with KER 3 specifically targeting integration into an existing product portfolio to enhance road safety solutions.

Finally, initiatives like KER 9 underscore the public-oriented impact of the project, with a focus on contributing to new legislation and standardisation processes. Overall, the exploitation approach across all KERs reflects a coordinated effort to maximise the value and reach of the project outcomes, both within and beyond the research community.

For KERs 3, 4 and 7 the partners involved established agreements to define their respective roles, rights, obligations and agreements regarding the exploitation of the results and future actions after the end of the HEIDI project. These agreements are retained by the coordinator in HEIDI's records for reference.

## 4. Update Business Model Canvas

As part of the activities during this period, the Business Model Canvas (BMC), presented in D8.7, were updated based on the updated and final exploitation pathway defined together with HEIDI partners during Y3 activities. The updated BMC reflects the intentions of the HEIDI consortium in terms of leveraging pathways to exploit project outcomes, combining product development, scientific dissemination, academic collaboration, and contributions to future research and standardisation, thereby ensuring that the KERs deliver long-term impact across industry, academia, and public policy domains.



Figure 4–1: HEIDI updated Business Model Canva.

## 5. Update HEIDI exploitation table (M36)

RESULT					BACKGROUND		EXPLOITATION INTEREST				IP (RESULT PROTECTION)	
Key Exploitable Result (KER)	Description	Partner	Type of result (commercial/non commercial)	WP	Background IP in which the result is based	Access Rights to background	Do you want to do a commercial exploitation? Will you do a sustainable exploitation?	Exploitation model	Main external stakeholders that may benefit	Access Rights to result OR Joint exploitation	Expected TRL for this outcome	Do you want to protect the results in IP terms?
Osmotic Layer	Application Programming Interface (API) for the transmission of information via a wireless connection between the vehicle and the outside world.	BMW, NISYS	Non-commercial: internal use	WP4	N/A	Access rights to background if needed for exploitation of another party's own results shall be granted on fair and reasonable conditions.	BMW: yes (long-term 2029+)	<ul style="list-style-type: none"> <li>• Prototype development, Cloud Computing.</li> <li>• Scientific publications and a proof of concept of the product.</li> </ul>	A, B, C, D, E, F	Access rights to results are granted on reasonable terms if they are necessary for another party's own results.	TRL 5	No
Fluid iHMI	Concept for adaptive vehicle interface based on driver's state monitoring	BMW, NISYS, VIF	Non-commercial: knowledge acquisition.	WP2	See Consortium Agreement (chapters 8,9, annex 1-party 1)	Access right to the background of other parties not envisioned	BMW: yes (long term: Yes. 2029+)	Network-based, media dissemination, research contribution to R&D projects and services.	A, B, D, E	Access rights to results are granted on reasonable terms if they are necessary for another party's own results.	TRL 6	No
Fluid eHMI	An external HMI which can react adaptively to the different road users and will communicate to many groups (or only specifically one person out of a group) and may present more information.	MAR, RUAS, UAH	RUAS & UAH: non-commercial: internal use. MAR: commercial: internal.	WP3	N/A	N/A	Internal exploitation to support our current research lines.	<ul style="list-style-type: none"> <li>• New scientific research with partners and similar stakeholders will be steered by the outcome and insights of the project.</li> <li>• eHMIs of different complexity are established in the market as a Lighting product enhancing road user safety. Thus, they become a sought-after part of MAR product portfolio.</li> <li>• Leverage the developed knowledge to support further research applications and PhD Theses.</li> </ul>	A, B, C, D, E, F	Joint research development and access to results from partners will be analysed for exploitation.	TRL 6	No

Integrated cooperative HMI with situation assessment, resolution, and decision module	Software system providing recommendation of optimal coordinated behavior for driver and outside participants via iHMI and eHMI	VTI, RUAS, HRIEU, VIF	Non-commercial. Focus on further challenging research aspects.	WP4	HRI-EU: Background IP around cooperative Risk Modelling	Access Rights to Background if Needed for Exploitation of another Party's own Results, shall be granted on Fair and Reasonable conditions.	No	To be included in further research services, raise interest of related entity towards the project itself but also towards the developed technologies; Leverage the developed knowledge to support further research applications. • Exploit new research insights in novel ways, to support new opportunities for PhD thesis and projects. • Scientific publications and a proof of concept of the application.	A, B, D, E, F	Joint further exploitation of research with e.g. BMW, NISYS, and HRIEU.	TRL 4	No
Situation resolution and tracking module	Algorithm that continuously evaluates behavior of driver and outside participants, compares it to a recommended best joint behavior and communicates deviations and criticality of deviations	HRIEU	Non commercial results: knowledge, know-how, scientific publications.	WP4	Background IP around cooperative Risk Modelling	Access Rights to Background if Needed for Exploitation of another Party's own Results, shall be granted on Fair and Reasonable conditions.	No	Raise interest of related entity towards the project itself but also towards the developed technologies; Leverage the developed knowledge to support further research applications. • Scientific publications and a proof of concept of the application	A, B, D	Access rights to results are granted on reasonable terms if they are necessary for another party's own results.	TRL 5	No
Sensing & behavioural predictive models for ego-driver	Algorithms that detect driver's distraction and predict driver's intentions	VIF, UAH	Non commercial: Internal exploitation to support our current research lines.	WP2	See Consortium Agreement (chapters 8,9, annex 1-party 1)	Access right to the background of other parties not envisioned. Bilateral agreement may be possible	No	Non-commercial. To be included in further research services, raise interest of related entity towards the project itself but also towards the developed technologies; Leverage the developed knowledge to support further research applications.	D, E	Joint further exploitation of research and technology between VIF and UAH.	TRL 6	No
Sensing & behavioural predictive models for pedestrians	Recognition of adult pedestrians and children pedestrians; recognition of pedestrian behavioural features and prediction of most likely future behaviours	RUAS, UAH	Non-commercial, Internal.	WP3	Perception system for pedestrian detection and action recognition	All partners are granted access to background in the framework of HEIDI	No	RUAS & UAH: internal exploitation to support research lines.	D, E	Joint research development between RUAS and UAH.	TRL 6	No
Unique multi-user simulation with driver and pedestrians (co-simulation)	Networked driving and pedestrian simulators of multi-user experiments	VTI, RUAS, HRIEU	Non-commercial - Leverage the developed knowledge to support further research applications.	WP5	N/A	N/A	No	Exploit new research insights in novel ways, to support new opportunities for PhD thesis projects and technology advancements.	D, E	Joint further exploitation of research and technology between RUAS, VTI and HRIEU.	TRL 5	No
Standardisation, ethical guidelines, and human-centred methodology	Catalogues targeting standardisation, ethical guidelines, and human-centred methodology	ALL	Non-commercial - public	WP5	N/A	N/A	No	Public exploitation through standardisation bodies.	C, D, E	Standardisation must be public.	N/A	No

## 6. Conclusion

Deliverable D8.9 presents the third-year report of the exploitation, sustainability and standardisation activities related to the work carried out within WP8 of the HEIDI project. The HEIDI exploitation pathway was described providing more details regarding the individual exploitation plans, the foreseen activities beyond the project ending and the exploitation analysis per KER. In addition, an update of the Business Model Canvas was made considering the information coming from the exploitation pathway described. An update of the exploitation table after completion of Y3 activities is also being provided.

All these activities have been done by working in close collaboration with work package leaders, and the project partners through the instrument designed for that aim under the activities of WP8.

## 7. Abbreviations

Term	Definition
AI	Artificial Intelligence
API	Application Programming Interface
CA	Consortium Agreement
eHMI	Fluid external HMI
GA	Grant Agreement
HEIDI	Holistic and adaptivE Interface Design for human-technology Interactions
HMI	Human-machine Interface
iHMI	Fluid internal HMI
IP	Intellectual Property
IPR	Intellectual Property Rights
KERs	Key Exploitable Results
PU	Public
R	Document, Report
R&D	Research & Development
WP	Work Package
Y	Year

## ANNEX I - HEIDI Exploitation strategy and roadmap per KER questionnaire

### Introduction

The following template is part of the activities defined in HEIDI's Exploitation Plan under task *T8.2 Exploitation, Sustainability, and Standardisation of Project Results*. The objective is to collect the necessary information from Project Partners regarding the exploitation route per KER and the roadmap to be followed by the end of project activities. The information collected through this template will be organized and discussed, if needed with the partners previous the delivery of the deliverable of *HEIDI Y3 exploitation, sustainability, and standardisation activities (D8.9)*, where the results of this work will be included.

### Instructions

Please fill in the tables thinking always on the KER you have developed/adapted/improved during the HEIDI project. The idea is to present a plan and estimation of the exploitation path each one of the HEIDI's outcomes will have after the end of the project. Please copy the tables one per KER if you are involved in more than one KER execution. Have in mind the other partners participating of each KER, and if needed please have an agreement in your contribution for the KER. After receiving all the contributions, we can have specific KER's meetings with the partners involved.

Use as a reference for completing the tables the following defined KERs and partners involved:

- **KER 1** - Osmotic Layer (BMW, NISYS)
- **KER 2** - Fluid iHMI (BMW, NISYS, VIF)
- **KER 3** - Fluid eHMI (MAR, RUAS, UAH)
- **KER 4** - Integrated cooperative HMI with situation assessment, resolution, and decision module (VTI, RUAS, HRIEU, VIF)
- **KER 5** - Situation resolution and tracking module (HRIEU)
- **KER 6** - Sensing & behavioural predictive models for ego-driver (VIF)
- **KER 7** - Sensing & behavioural predictive models for pedestrians (RUAS, UAH)
- **KER 8** - Unique multi-user simulation with driver and pedestrians (co-simulation) (VTI, RUAS, HRIEU)
- **KER 9** - Standardisation, ethical guidelines, and human-centred methodology (ALL)

### HEIDI KER's Exploitation route

KER nº XX Exploitation route (how the KER will be further exploited)			
Selected route		Implementing actor	Yes
<b>DIRECT USE</b>	<b>Commercialisation:</b> <i>deployment of a novel product/service (offered to the target markets)</i>	<b>One partner</b>	
		A group of partners	
	<i>Contract research (new contracts signed by the research group with external clients)</i>	A partner	
		A group of partners	
	<i>A new research project (application to public funded research programmes)</i>	A partner	
		A group of partners	
	A partner		

	Implementation of a new course ( <i>Note that a training course is a service</i> )	A group of partners	
		A new partnership	
INDIRECT USE	Assignment of the IPR	A partner	
		A group of partners	
	Licensing of the IPR	A partner	
		A group of partners	
	Development of a new legislation/standard	A partner	
		A group of partners	
	Spin-off	A partner	
		A group of partners	
By assignment			
	By licensing		
	Other ( <i>please describe</i> )		

### HEIDI KER's Exploitation roadmap

KER n° XX Exploitation roadmap	
<b>Actions*</b>	
<b>Roles*</b>	
<b>Milestones*</b>	
<b>Financials Costs</b>	
<b>Revenues</b>	
<b>Other sources of coverage</b>	
<b>Impact in 3-year time*</b>	

\*Mandatory

\*\* If some point is not applicable, please add N/A.

## ANNEX II - HEIDI main exploitation stakeholders

The HEIDI consortium identified (in D8.3) the following stakeholders' categories that may be interested in the exploitation of the project results:

Target group	Description	Time frame	Channel
A – Business stakeholders	Automobile operators, and other stakeholders who might use or receive benefits from HEIDI assets (e.g., significant increase in safety).	Last 12 months of the project	Website, digital press notes in specialised websites, workshops, B2B, etc.
B – IT technology providers; Industry associations and clusters	OEMs in partner network: As beneficiaries of HEIDI HMI solutions and guidelines regarding ethics and human-centred methodology. Raising awareness of the challenges in the field of technical/modelling and HMI; present the results; raise interest towards the project itself but also towards the developed technologies, build support.	Project life	Website, digital press notes, workshops, newsletters, exhibitions, etc.
C – Policy makers and Standardization Organisations	Adopting the standardisation guidelines developed in the HEIDI project (e.g., like EuroNCAP and IEEE)	Last 12 months of the project	Uptake of standardisation guidelines resulting in improved legislation and standardisation, especially for external HMIs. Adaptation of ethical and human-centred guidelines by the broader community.
D – Scientific Community	Promoting the scientific developments of HEIDI in compliance with the Findable, Accessible Interoperable, and Reusable (FAIR) principle and the open science practices. Scientific publications and further evolving the state of the art.	From M6 until the end of the project	Academic conferences, scientific journals, exhibitions, social media, newsletter, final event, community work.
E – Related R&D projects and Networks	Involving or establishing networks to disseminate public project findings, and exchange knowledge.	Project life	HEIDI website, social media, workshops, exhibitions, international conferences, newsletter, final event.
F – End users (Road users)	Drivers and other road users, as main users of these technologies. Promotion of the HEIDI project to raise awareness and build support.	Project life	HEIDI website, social media, workshops, exhibitions, international conferences, newsletter, final event.