

Open access  
**virtual testing protocols**  
for enhanced  
**road user safety**

# **Final report on dissemination of the EU-funded project VIRTUAL**

Deliverable D7.5 – WP7 – PU

VIRTUAL – open access virtual testing protocols for enhanced road user safety





# Final report on dissemination of the EU-funded project VIRTUAL

Work Package 7, Deliverable D7.5

## Please refer to this report as follows:

Van Gils, S. (2022)

Final report on dissemination of the EU-funded project VIRTUAL, Deliverable D7.5 of the H2020 project VIRTUAL.

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<b>Coordinator:</b>	Astrid Linder, PhD, MSc - Professor, Traffic Safety Swedish National Road and Transport Research Institute (VTI) Regnbågsgatan 1, 417 55 Lindholmen, Göteborg, Sweden
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## Lead contractor for this deliverable:

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### Revision history

Date	Version	Reviewer	Description
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8-12-2022	Final deliverable	Astrid Linder – VTI	Final review
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# Table of contents

Executive summary .....	4
<b>1 Dissemination and communication objectives .....</b>	<b>5</b>
<b>1.1 Objectives .....</b>	<b>6</b>
<b>1.2 Positioning and target groups .....</b>	<b>6</b>
<b>2 Dissemination and communication strategy .....</b>	<b>7</b>
<b>2.1 Visual identity .....</b>	<b>7</b>
<b>2.2 Videos.....</b>	<b>12</b>
<b>2.3 Websites.....</b>	<b>14</b>
<b>2.4 Newsletters .....</b>	<b>17</b>
<b>2.5 Social Media .....</b>	<b>21</b>
<b>2.6 Workshops.....</b>	<b>26</b>
2.6.1 Kick-off workshop.....	26
2.6.2 Mid-term workshop .....	28
2.6.3 Hands-on workshop.....	31
2.6.4 CBA tool workshop .....	32
<b>2.7 Events.....</b>	<b>35</b>
2.7.1 Mid-term review meeting .....	35
2.7.2 Final event.....	35
<b>2.8 Scientific publications .....</b>	<b>39</b>
<b>2.9 Conferences and presentations .....</b>	<b>40</b>
<b>2.10 General (non-scientific) publications .....</b>	<b>45</b>
<b>2.11 Media.....</b>	<b>48</b>
<b>3 Visibility of EU funding.....</b>	<b>54</b>
<b>4 Activities &amp; achievements.....</b>	<b>55</b>
<b>4.1 Project awareness indicators to date .....</b>	<b>55</b>
<b>4.2 Communication actions .....</b>	<b>55</b>
<b>4.3 Publications &amp; presentations - overview .....</b>	<b>56</b>
<b>4.4 Dissemination overview .....</b>	<b>64</b>
<b>5 Exploitation – next steps .....</b>	<b>76</b>
<b>6 Conclusion.....</b>	<b>78</b>

## Executive summary

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For the past 4,5 years VIRTUAL has been establishing a European hub for open access virtual testing and demonstrating its success, which required many activities related to dissemination and exploitation. The objective of WP7 was to maximize the impact of the project by developing and supporting a thriving (online) community, pitching project objectives to stakeholders, and facilitating connections within the network and engaging with the stakeholders.

This report outlines the dissemination and communication activities which were carried out by the VIRTUAL project partners to maximize the projects' impact. The initial dissemination plan helped to make communication more strategic, consistent, and effective, and thus more powerful. A yearly updated version of that plan was created as one of the deliverables in WP7.

This final report not only documents the dissemination and exploitation activities as complete as possible, but also gives an impression of the great team spirit within the consortium and the support and feeling of togetherness our consortium encountered along the way.

Fortunately, we had the chance to meet our stakeholders live again during the last, very important, stretch of our project. Nothing beats meeting in person, attending scientific presentations in person, initiating and filming interviews and having lively discussions at a conference booth or over diner with curious OEMs.

It has been a delight being the Dissemination Manager of this (potentially) game changing project... Virtual Testing is here to stay!



Developing a solid (online) community required the steps above. Community engagement and stakeholder involvement are key for a continuous growth of the community.

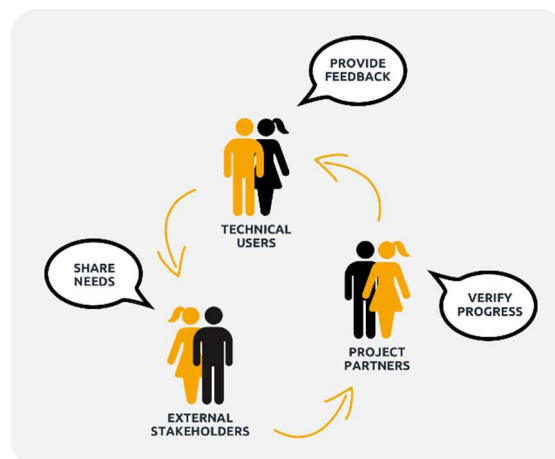
# 1 Dissemination and communication objectives

The VIRTUAL project aimed to create a safer road transport system by providing improved, ready-to-use safety assessment tools. The open-source strategy of this project is the key to ensuring high market penetration of the tools provided. However, first and foremost, VIRTUAL meant to make a sustainable impact. Therefore, the results of the project, the Open Virtual Testing platform with all its contents, will remain available, making a significant difference compared to previous projects on virtual testing and human body modelling.

WP7, the work package dedicated to maximising the impact of the VIRTUAL project, addressed dissemination and exploitation – supported by the other WPs that contributed with input. The project partners were committed to disseminating the projects' research results.

VIRTUAL established a European hub for open access virtual testing in traffic safety and demonstrated its effectiveness to all stakeholders, by involving the active community of project partners, technical users and other stakeholders.

WP7 provided the fundament for the development of this solid community. It allowed project partners to verify that the projects' progress was in line with the expectations/needs and enabled external stakeholders to share their experiences with the team. Facilitating the dialogue within the community from the start contributed to maximising the impact of VIRTUAL and increasing the exploitation opportunities.



## 1.1 Objectives

The following objectives were defined:

Objective	Description
1.	Maximise the impact of the VIRTUAL project, by widely disseminating research results.
3.	Ensure that end-users are aware about virtual testing, to create demand for new products and services.
5.	Facilitate interaction and dialogue within the community from the start; contribute to maximising the impact of VIRTUAL and increase the exploitation opportunities.

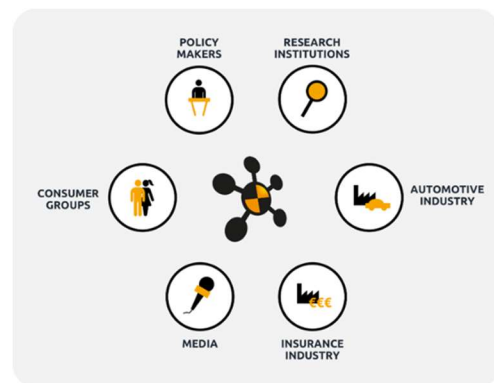
## 1.2 Positioning and target groups

VIRTUAL was based on unique transdisciplinary, scientific collaboration encompassing a wide range of skill areas which together contributed to the objective of improving traffic safety through Virtual Testing (VT).

To make VT successful, VIRTUAL meant to form a bridge between elaborate scientific methodologies related to HBMs and future transport needs. Its dedication to open-source accessibility of Human Body Models and VT protocols distinguished it from other approaches. Applying this open access strategy paved the way for successful and sustainable introduction of these technologies and thus contributes greatly to the development of measures improving road (user) safety.

Seven target groups were identified:

1. Technical users
2. Experts
3. European and national policymakers
4. Advisory bodies
5. Industry partners (automotive industry, OEMs)
6. Media
7. Consumer groups (automobile clubs, public transport user associations)



## 2 Dissemination and communication strategy

**At the start of the project, the communication and dissemination strategy was developed leading to better design and set-up of messages, tools, channels. Yearly updates (deliverables) were created.**

**The D&C Strategy included following activities:**

- Development of the projects' visual identity (example of communication means: digital flyers, website, templates, newsletters, website, socials, videos, banners, merchandise)
- Content management (website and social media)
- Community management; facilitating dialogues within the online community
- Dissemination through presentations and events
- Project videos highlighting the progress and/or results of the project
- Organising (online) events, such as workshops and webinars

Many activities offered a two-way exchange to collect feedback from the target audiences, favouring public and societal engagement.

### 2.1 Visual identity

A visual identity of the project (M7.3), compiled in a user guide, was developed at the start of the project. Consistently using the project identity for the websites, newsletters, banners, presentations, templates, leaflets, posters, videos, flyers, pens and other giveaways helped to improve the recognizability and impact of the project.

During the course of the project we've established VIVA+ (open-source finite element human body models) accompanied by its own logo that is. Recognizable, with a clear link to the VIRTUAL project. The process of filing for trademarking of this logo has been initiated.

As part of the exploitation plans 'The OpenVT Organisation' (OVTO) has been set up, a politically independent non-profit association. OVTO promotes and supports research related to virtual testing and computer modelling in biomechanics and traffic safety to achieve vision zero for all road users. Low level access, open access. OVTOs' ambition is to host open-source projects related to virtual testing and biomechanics on the OpenVT platform, created within the Horizon 2020 VIRTUAL project, maintaining them and ensuring the sustainable evolution in the future, whilst providing user support.

Its (our) ambition is to host open-source projects related to virtual testing and biomechanics on the OpenVT platform (the platform for open access virtual testing for enhanced road users safety, created within the VIRTUAL project) maintaining them and ensuring the sustainable evolution in the future, whilst providing user support.

OVTO promotes and supports research related to virtual testing and computer modelling in biomechanics and traffic safety to contribute to Vision Zero for all road users: open access.





We also created a logo for OVTO followed by a website: [ovto.org/](https://ovto.org/)





# Brand Identity

General guidelines & instructions  
for the use of the corporate identity

Version 1.1 - August 2018

## TYPOGRAPHIC Styles

Our preference of typography styles are shown here as an example. Headings are always used in "Black" and in "White" on a dark background. The titles and subtitles will be used in the color "Orange".

The size of the letter obviously depends on where it is applied and in particular the amount of space available for this. Therefore, these sizes can be taken as a guideline with the VIRTUAL style.

**This is a large heading**

**This is a titel**

**This is a example of a subtitle**

For print, preference is given to 'Ubuntu'. At times that this font is available or applicable, we use the secondary font 'Tahoma'

- Here is a list that can be used
- These can be in the same size as the plain text
- As preferred in the font 'Ubuntu'

**Headings**  
Ubuntu Bold  
Grootte 40pt  
Afstand 30pt  
Color Black

**Titels**  
Ubuntu Regular  
Grootte 24pt  
Afstand 30pt  
Color Orange

**Subtitels**  
Ubuntu Regular  
Grootte 9 pt  
Afstand 12 pt  
Color Orange

**Plain Text**  
Ubuntu Light  
Grootte 9 pt  
Afstand 12 pt  
Color Black

**Summaries**  
Ubuntu Regular  
Grootte 9 pt  
Afstand 12 pt  
Color Black

## THE LOGO Variants

Thanks to the use of a unique font, the logo is very recognizable in all its simplicity and a basic element in the identity. It is important that the word image is always used in the same way.

The logo has a CMYK and RGB variant. The CMYK logo versions can be used in all printed material. The RGB variant can be used in all digital communications.

Primary logo



This is the primary logo. We prefer the use of this logo in both shape and color.

Black and white logo



The black and white logo may only be used if no color application is possible at all. For example, in newspaper advertisements or black-and-white copies.

Standard logo



The logo and symbol can be used separately. Desirable is to use this in combination.



**The Open Virtual Testing Organisation**

- Safe mobility for everyone
- Collaborative open-source model and tool development
- Open Source Human Body Models

**Become part of the OVTO community!**

Shape the future with your contribution or sponsorship



[www.ovto.org](http://www.ovto.org)

OVTO is a politically independent non-profit organisation, originated from the EU-funded Horizon 2020 project VIRTUAL



**VIVA+**  
Open Source Human Body Models

Safety doesn't happen by accident



## Online workshop: Introduction to the VIVA+ models and OpenVT Platform - How can everyone contribute?

DATE: 10.09.2020  
ONLINE WORKSHOP  
REGISTER NOW »

The online workshop is a hands-on experience for students and researchers who intend to use and contribute to the VIVA+ models.

### Requirements

The workshop is free of charge, but limited to 25 participants. Therefore access will be limited to those who complete a small exercise, which will be sent out prior to the workshop to prove the motivation (not skills) of the participants.

### Programme

1. Introduction to VIVA+ models
2. Introduction to OpenVT platform
3. Using Git for versioning and collaborative model development
4. Model post-processing (using Dynasaur and Jupyter) and reporting

### Date & registration

Date: 10th of September 2020, 13:00

Location: registered users will receive the url to attend the workshop per email.  
Register now »



projectvirtual.eu

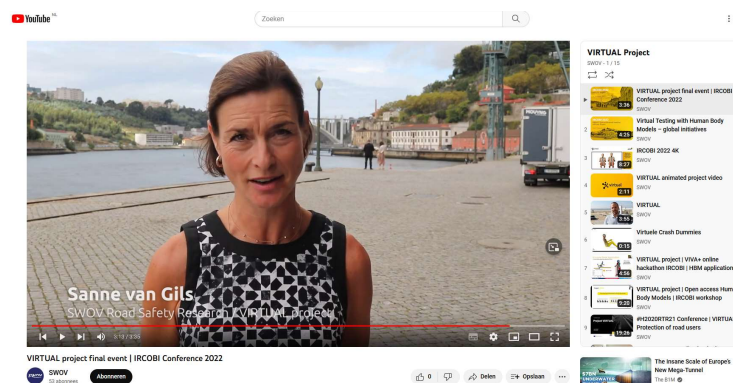
Join the conversation: Follow us on [Twitter](#) and [LinkedIn](#)

## 2.2 Videos

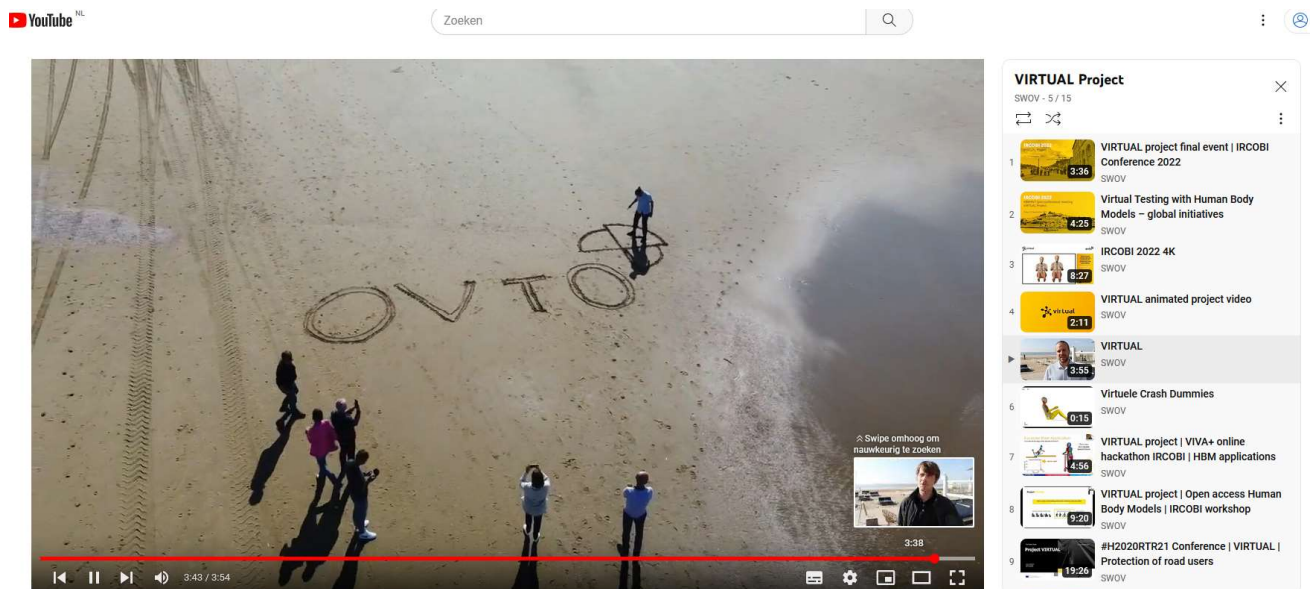
The VIRTUAL project video playlist is available on YouTube:  
[www.youtube.com/playlist?list=PLtYQif034Fw-xxHsi91K5SbjhhdVfV51j](https://www.youtube.com/playlist?list=PLtYQif034Fw-xxHsi91K5SbjhhdVfV51j)

The aim of our videos has been to involve our target audiences in a captivating way and letting our stakeholders explain the importance of our project and their view on our scientific research and achievements. We have benefitted from having the filming and editing expertise in-house to create these videos throughout the project.

Besides a short summary of events, the videos also contain a call to action and an outro mentioning partners, contact details and EU funding details.



Recording a call to action at IRCOBI conference in Porto (final event).

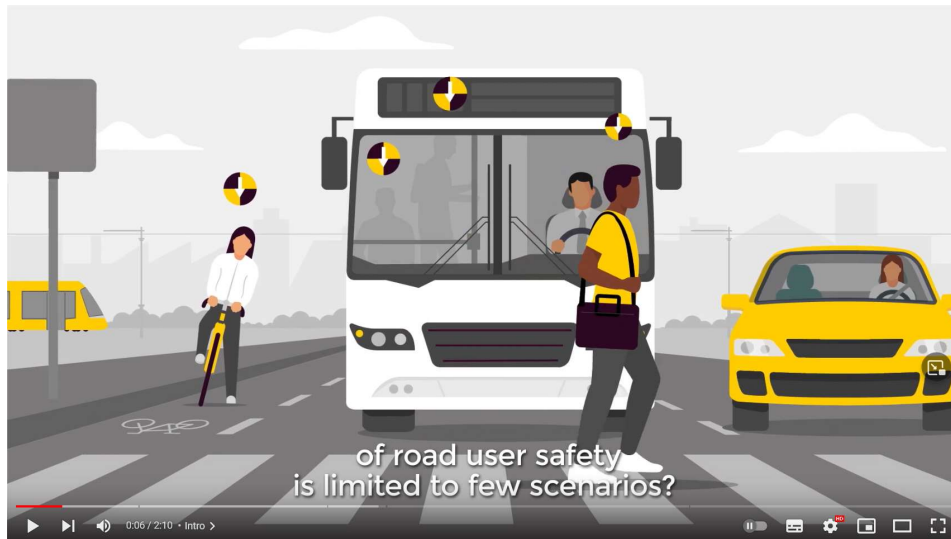


Creativity and exploitation plans in the mix during our GA meeting in Scheveningen (June 2022).

Our animated project video, highlighting our outputs, is also in the list.  
[youtu.be/OMIe7HaERZs](https://youtu.be/OMIe7HaERZs)



We created a taskforce to work on the storyboard and script of this video. It proved to be quite a challenge to create an animated film, which is sufficiently accurate and conveys the right message to our target audiences. Our research topic and results can be hard to understand for those not involved in the subject.





'Inclusive crash safety'.

## 2.3 Websites

The VIRTUAL project website (Milestone 7.1 + Milestone 7.4I) was launched in June 2018 and has approximately 13.300 visitors to date. The hub for all online communication and dissemination to all target audiences.

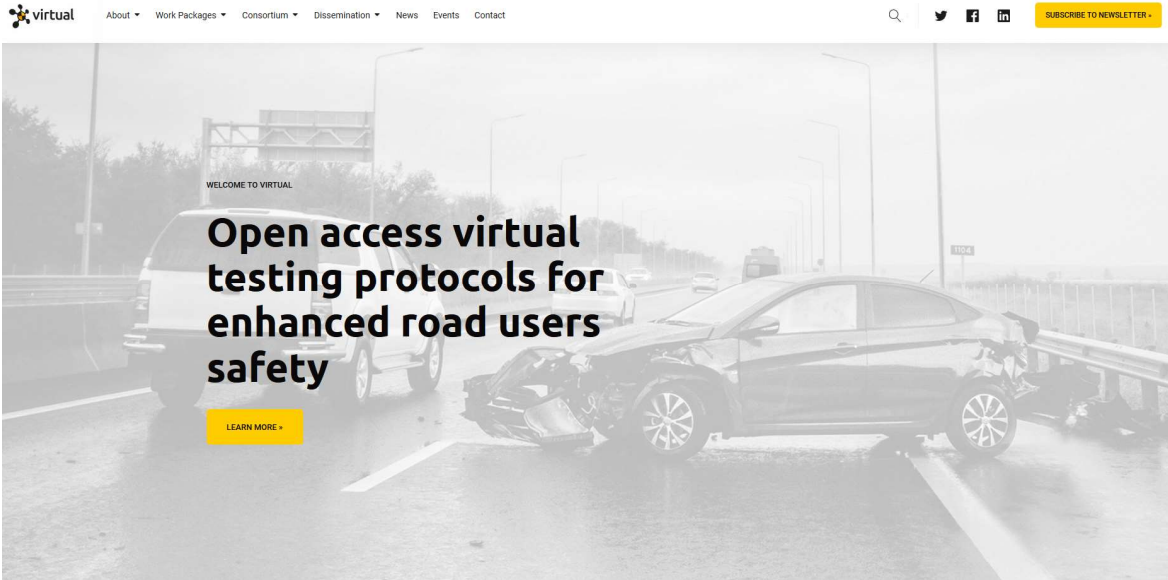
We generated traffic from our social media channels to the VIRTUAL project website (see chapter [2.4](#))

We wanted stakeholders to not only visit the website themselves, but also to act as VIRTUAL ambassadors, sharing and promoting the website and its contents within their (online) network.

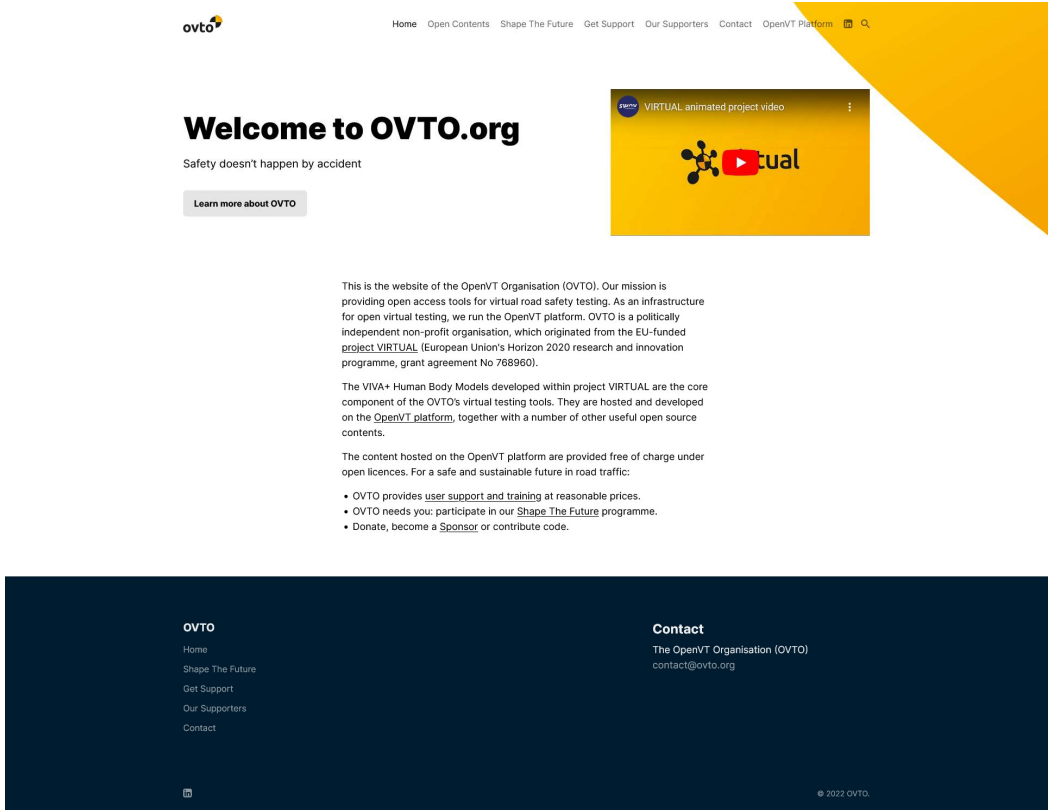
The responsive website contains:

- A specific section explaining the project, under About
- A section explaining the set-up of the Consortium
- A section explaining the Work Packages
- A section covering all news items and overview of events
- A section where the project outcomes will be published (Dissemination)
- A contact form

All of the outputs developed during the project are freely available on the website: [projectvirtual.eu](http://projectvirtual.eu)



As part of VIRTUALs' exploitation plan [ovto.org](https://ovto.org) was set-up mid 2022; the website of The OpenVT Organisation (OVTO). Its mission is providing open access tools for virtual road safety testing. OVTO is a politically independent non-profit organisation, originating from the VIRTUAL project.







As an infrastructure for open virtual testing, OVTO runs the OpenVT platform; [openvt.eu](https://openvt.eu). The VIVA+ Human Body Models are the core component of OVTO's virtual testing tools. These are hosted and developed on the OpenVT platform, together with a number of other useful open-source contents. The content hosted on the OpenVT platform are provided free of charge, under open licences.

### OpenVT Gitlab platform



Username or email  
sanne.van.gils@swov.nl

Password  
\*\*\*\*\*

Remember me [Forgot your password?](#)

[Sign in](#)

Don't have an account yet? [Register now](#)

This is the OpenVT platform, the platform for open access virtual testing for enhanced road users safety.

You can browse the Public contents without registration and sign-in: [Overview Public contents](#).

As a new user, you can create an account using the sign-up mask to the right. Your account will be unlocked after confirmation by the platform admins. Please, check out our [manuals and guidelines section](#) and the [OpenVT wiki](#). There you also find a [FAQ section](#).

The OpenVT platform is part of project VIRTUAL. For more information, see [projectvirtual.eu](https://projectvirtual.eu).

The supporting documentation and validation catalogues are part of the projects' outputs and have their own websites: [vivaplus.readthedocs.io/](https://vivaplus.readthedocs.io/) and [vivaplus-validation.readthedocs.io/](https://vivaplus-validation.readthedocs.io/)



Search this book...

VIVA+ Validation Catalog

**FULL MODEL**

- Blunt Impacts
- Frontal Impact
- Rear Impact
- Lateral Impact
- Standing

**SUBMODELS**

- Head
- Neck
- Thorax
- Abdomen/Pelvis
- Lower Extremity

Powered by Jupyter Book

[Read the Docs](#) [v. latest](#)

### VIVA+ Validation Catalog

The validation simulations for the VIVA+ models are documented in this catalog.

The simulations are arranged in two sections based on the models used in the simulations: Full Model and Sub/Isolated Models.

#### Full Model

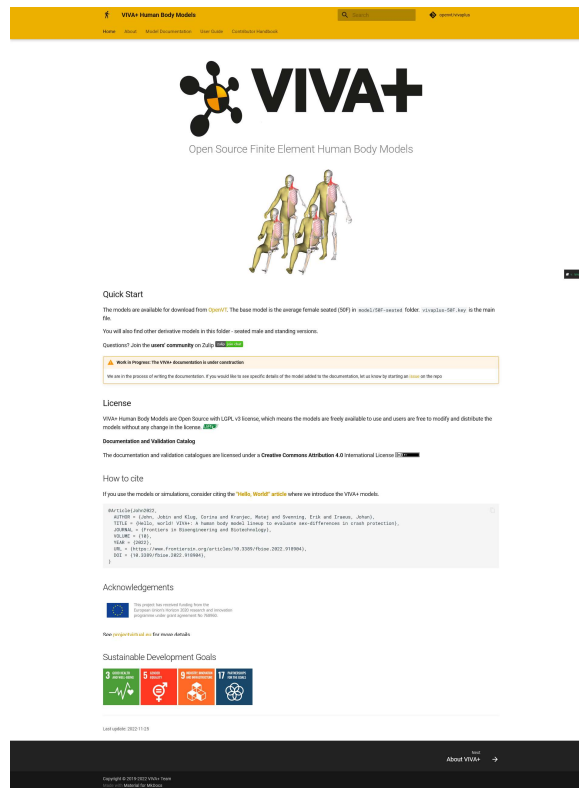
- Blunt Impacts
  - Mid-Sternum (Kroell 1971)
  - Lateral Impact (Viano 1989)
  - Abdominal Impact (Hardy 2001)
  - Back impact (Viano 2001)
  - Shoulder impact (Compigne 2004)
  - Back impact (Forman 2015)
- Frontal Impact
  - Frontal sled (Crandall 2011, 2013, 2016)
- Rear Impact
  - Rear sled (Yoganandan 2000)
- Lateral Impact
  - Farside Sled (Forman 2013)
  - Nearside Sled (Miller 2013)
  - Nearside Sled (Wood 2014)
- Standing
  - Pedestrian (Snedeker 2005)
  - Pedestrian (Pass 2005)

#### Submodels

- Head
  - Head (Loyd 2014)
- Neck
  - Flexion-Extension (Nightingale 2002)
  - Flexion-Extension (Wheeldon 2006)
- Thorax
  - Single Rib (Forman 2020)
  - Single Rib (Kang 2020)
  - Tabletop (Kent 2004)
- Abdomen/Pelvis
  - Denuded Pelvis (Guillemot 1998)
- Lower Extremity
  - Proximal femur (Ariza 2015)
  - Knee Lateral Bending (Bose 2008)
  - Femur shaft (Ivarsson 2009)
  - Tibia shaft (Ivarsson 2006)

Not Blunt Impacts

By VIVA+ community



## 2.4 Newsletters

News flashes and Event flashes were issued regularly (2x per year on average) and published on the website and emailed to/shared with the online community consisting of 197 subscribers. The topics varied, depending on the research outputs.

The articles were generally introductions to the website posts and aimed at generating more traffic to the website.

Content themes:

- project progress
- project results/outcomes (publications, deliverables)
- announcements of events
- interviews with experts, mostly videos (research, best practices)
- summaries of events/conferences/workshops

The newsletters have been shared on social media.

Overview of all newsletters (Mailchimp):

[us18.campaign-archive.com/home/?u=09def67f31bee53b2405b0fcb&id=0836da5a09](https://us18.campaign-archive.com/home/?u=09def67f31bee53b2405b0fcb&id=0836da5a09)



## Subscribe to the VIRTUAL newsletter!

### Email Campaign Archive

from VIRTUAL

[join our mailing list](#)

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30/11/2022 - [One step closer to inclusive crash safety assessment](#)

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20/10/2022 - [Virtual Testing with Human Body Models](#)

---

28/03/2022 - [OpenVT platform 2.0 live](#)

---

09/09/2021 - [Last stretch for VIRTUAL project](#)

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12/07/2021 - [Register now: VIVA+ Online Hackathon](#)

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21/09/2020 - [Watch now: Progress in Virtual Testing for automotive applications](#)

---

07/07/2020 - [VIRTUAL online workshop](#)

---

26/09/2019 - [Virtual Testing and Open Source Human Body Modelling](#)

---

16/04/2019 - [Register now for the IRCOBI pre-conference workshop](#)

---

29/10/2018 - [Influential experts exchange knowledge during VIRTUAL workshop](#)

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11/09/2018 - [VIRTUAL workshop: register now](#)

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## Newsflash.



**IRCOBI, FLORENCE**  
**How to improve safety assessment using Virtual Testing and HBMs**  
**September 10, 2019**

### IRCOBI: pre-conference workshop

How to improve safety assessment using Virtual Testing and HBMs?  
Two projects, two approaches.

IRCOBI Europe will take place from 11 to 13 September, 2019 in Florence, Italy. On 10 September the H2020-projects OSCAR and VIRTUAL organise a pre-conference workshop on Virtual Testing and open-source Human Body Models.

The [programme](#) of the workshop can be found on the [IRCOBI-website](#), where one can also register.

[Register now »](#)

### Review of average sized male and female occupant models in European regulatory safety assessment tests and European laws

This study shows the gap between law and practice as well as the gap between the superior legal principle gender equality and subordinate legal rules, and how these gaps occur and persist. Moreover, the study highlights the (urgent) need for questioning the law: Why the law does not give priority to the protection of women's traffic safety in a similar manner it does with regard to the traffic safety of men.

[Read more »](#)

### Paper: Risk of non-collision injuries to public transport passengers

The main objective of this paper, written by Rune Elvik, was to provide an estimate of the expected number of injured passengers per year for a public transport vehicle producing, for example, one million passenger kilometres per year. It is found that the expected number of injured passengers for such a vehicle will be about 0.5 to 0.8 per year.

[Read more »](#)

### Join the community!

Join our [online community](#) to exchange knowledge, follow us on [Twitter](#) and [subscribe](#) to the VIRTUAL newsletter to stay fully informed on the project's proceedings.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 74187421.

## Newsflash.



### From the coordinator

First, I want to thank all partners for their tireless contribution and great spirit within the consortium. In addition to delivering high quality on time the partners have, on several occasions, helped each other out when needed.

The pleasant atmosphere was maintained throughout the project, thanks to all individuals that did not let go before arriving at where we are today.

Furthermore, I want to thank the members of the advisory and international group; we have benefitted from your generous support and valuable views.

Last but not least, we have had the best possible support and constructive guidance from the Project Officers from CINEA throughout our project. Thank you for that!

I am proud of our accomplishments and contribution to inclusive crash safety assessment, virtual testing and the sharing of knowledge through open-source models and tools.

Astrid Lindor (VTI)

### VIDEO | VIRTUAL project update

Have a look at one of our recent videos, highlighting the VIRTUAL Cost-Benefit Analysis Tool, the VIVA+ human body models, the Seat Evaluation Tools and The OpenVT Organisation (OVTO).

[Watch now >](#)

### Data on Equitable Occupant Protection

On the 17th of November Astrid Lindor presented the VIRTUAL project and some of its main results, with a focus on the VIVA+ 50M and 50F models and the SET 50F and 50M, in the DEOP meeting.

[Read more >](#)



### Integrity of virtual testing for crash protection

In the area of passive car safety, finite element simulations can be used to get further insights, use more biofidelic human models and make the overall assessment more robust by incorporating more variety in the virtual testing load cases. For a successful implementation of virtual testing in regulations or consumer information, the integrity of the procedure has to be ensured. In this paper we developed a secure procedure for model version control.

This research paper 'Integrity of virtual testing for crash protection', published today, is written by Esma Galljatovic, Maria Eichlsedor, Simon Franz Heindl and Corina Klug. The master's thesis in which this study was performed has received support from the VIRTUAL project.

[Read more >](#)



### TRA 2022

Wim Wijnen had a poster session and gave a live demonstration of our CBA tool. The VIRTUAL cost-benefit tool includes several novel elements as compared to standard cost-benefit analysis in the field of road safety.

[Read more >](#)

The VTI stand showcased world's first crash dummy, SET50F, based on an average woman, developed within our project. No, it didn't exist before, and still doesn't really exist now as it's a prototype, but we are one step closer. Also a big Thanks to all the curious booth visitors, bringing up questions and helping us show the obvious...

[Read more >](#)

### Publications and deliverables

All public [deliverables](#) and [publications](#) can be found on our website.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 756966.



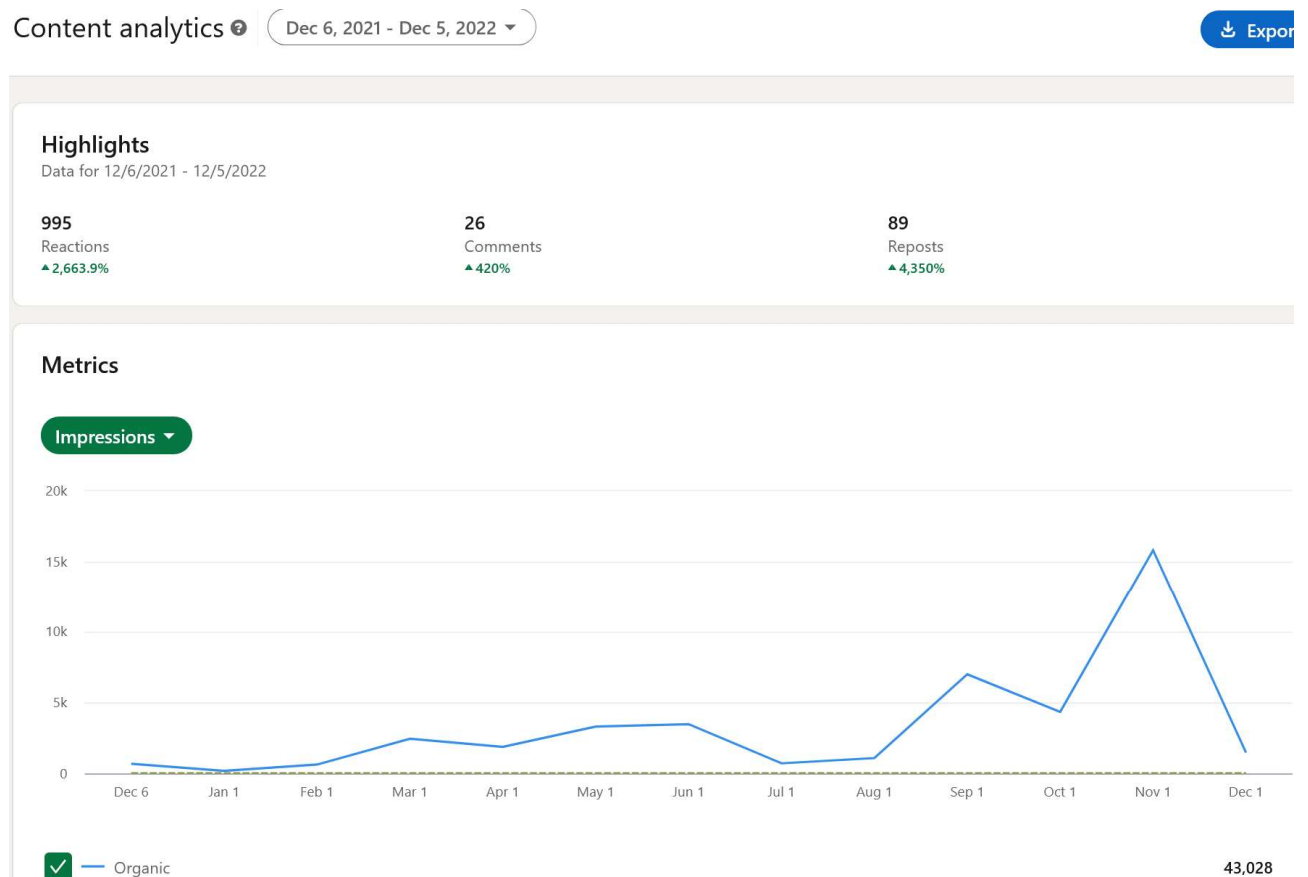
## 2.5 Social Media

Our online community consists of the identified stakeholders in combination with parties which might be interested in our project proceedings/successes, such as the general public and the media.

- The following social media accounts have been up and running since July 2018:
  - Twitter (183 followers – 116 tweets): [twitter.com/eu\\_virtual](https://twitter.com/eu_virtual)
  - LinkedIn page (556 followers): [www.linkedin.com/company/virtual-project/](https://www.linkedin.com/company/virtual-project/)
  - LinkedIn group (240 members): [www.linkedin.com/groups/12127204/](https://www.linkedin.com/groups/12127204/)
- The aim of the social media accounts has been to:
  - Enable knowledge transfer
  - Announce events
  - Provide/share project updates
  - Updates and pictures from workshops, presentations, events, conferences
  - Share/repost updates from related accounts or initiatives, partners, and (liaison) projects (such as OSCCAR and PIONEERS)

Of course the social media accounts were monitored and content was tailored along the way.

Impression of the reach (impact) of our LinkedIn page in the last year:



## Impression of the reach (impact) of random tweets:

Nov 2022 • 30 dagen

TWEETHOOGTEPUNTEN

**TopTweet** 609 weergaven verdiend

Don't miss these, not so, average **#females** at **#tra2022** demo area **@TRA\_Conference @vtisweden #virtualtesting #roadsafety #transport #mobility #vision2030 #h2020 #horizon2020 @EU\_Commission #h2020transport @SanneGoedee #scicomm #vru #dummy #sciencecommunication #scientificresearch**  
[pic.twitter.com/TBX88Vu18E](https://pic.twitter.com/TBX88Vu18E)



↻ 2   ♥ 7

OVERZICHT VAN NOV 2022

Tweets	Tweetweergaven
4	1.211
Bezoeken aan profiel	Vermeldingen
276	1
Nieuwe volgers	
2	

Aug 2021 • 31 dagen

TWEETHOOGTEPUNTEN

**TopTweet** 582 weergaven verdiend

Tonight on German television, Das Erste (ARD) - 16.08.21 | 22:50: "HERstory": [lnkd.in/eu9mD43R](https://lnkd.in/eu9mD43R)  
 "HERstory" begleitet die schwedische Verkehrssicherheitsforscherin Astrid Linder ins Crash-Test-Labor. **#gendergap #female #RoadSafety #research #crashtest**  
[pic.twitter.com/H2lwfnKtUP](https://pic.twitter.com/H2lwfnKtUP)



**Toptweet met media** 494 weergaven verdiend

Have you registered for our VIVA+ online **#hackathon** yet? For information & registration go to: [projectvirtual.eu/2021/07/06/viv...](https://projectvirtual.eu/2021/07/06/viv...) [pic.twitter.com/q6xn8S8DEL](https://pic.twitter.com/q6xn8S8DEL)



↻ 1   ♥ 3

OVERZICHT VAN AUG 2021

Tweets	Tweetweergaven
3	1.784
Bezoeken aan profiel	Nieuwe volgers
22	0

[Alle Tweetactiviteit weergeven](#)



**VIRTUAL project**  
@eu\_virtual

Open access virtual testing protocols for enhanced road user safety. This project receives funding from the @EU\_H2020 Research & Innovation Programme.

The Hague, The Netherlands  
projectvirtual.eu  
Geregistreerd in juni 2018

Foto's en video's

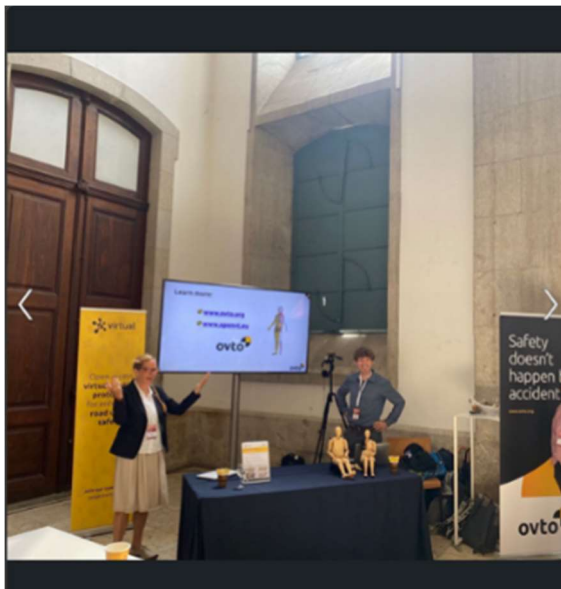
**VIRTUAL project**  
@eu\_virtual

Completed a successful (first) day of volunteer tests at the University of Ljubljana! We managed to find enough space on the volunteers to put all the sensors... ;-)  
#virtualtesting #standingpassengers #RoadSafety

Tweet vertalen



23:39 - 17 jul. 2019 vanuit Slovenië



**VIRTUAL project | OVTO**  
556 followers  
2mo • Edited

During the lunch break we gave our first booth presentation. It focused on our developments of the SET models. In addition OVTO, the organization that has been established to further develop the results of the #H2020 VIRTUAL project, was presented.

Tomorrow another presentation at 1pm! Join us!

#icobi #results #scicomm #exploitation #opencourse #virtualtesting #finalevent #roadsafety #biomechanics #hbm #vti #finalevent

Trake Tegen-Schaap and 26 others  
2 reposts

Like Comment

Comment as VIRTUAL project | OVTO...






**VIRTUAL project**  
@eu\_virtual · Follow

@cinea\_eu's Anca Pasca introducing and moderating the session on protection of #road users on Tuesday. #EU-funded @OscarProject, @eu\_virtual and @PIONEERS\_proj on stage, presenting their #results. #Virtualtesting #Roadsafety @CCAM\_EU @2Zeroemission @ERTRAC\_EU

**C Connected, Cooperative & Automated Mobility (CCAM)** @CCAM\_EU  
At the #H2020RTR21 "Protection of road users" session, projects @eu\_virtual, @OSCCARProject & @PIONEERS\_proj showed approaches to virtual & physical testing, as well as homologation for vehicle occupant & other users safety while using diverse Human Body Models



VIRTUAL project | OVTO posted this · 2w



Don't miss these, not so average. #females at the #tra2022 demo area: Astrid Linder and #set50f .

...show more

Targeted to: All followers

**Organic discovery**

3,007 Impressions      2,206 Unique impressions

💡 Get more impressions by sponsoring your post. [Boost](#)

**Organic engagement**

<b>157</b>	<b>5.2%</b>	
Engagements	Engagement rate	
Clicks		65
Click-through rate		2.2%
Reactions		87 →
Comments		1 →
<a href="#">Reposts</a>		4 →

Just aired by [BBC News](#) "The crash dummy aimed at protecting women drivers". [...show more](#)



**BBC | The crash dummy aimed at protecting women drivers**  
projectvirtual.eu • 1 min read

Targeted to: All followers

### Organic discovery

**4,027**

Impressions

**2,602**

Unique impressions



Get more impressions by sponsoring your post.

**Boost**

### Organic engagement

**232**

Engagements

**5.8%**

Engagement rate

Clicks

**130**

Click-through rate

**3.2%**

Reactions

**96** →

Comments

**4** →

[Reposts](#)

**2** →

VIRTUAL project <small>Super admin view</small>							
All Pages	Products	Content	Analytics	Activity			
<p>stiletto, Tora Schultz's #show 'Bitch on...</p> <p>Posted by <a href="#">Sanne van Gils-Goedee</a></p> <p>11/23/2022</p> <p><b>Boost</b></p>		Image	All followers	911	-	41	4.5%
<p>Inclusive crash safety   TRA 2022</p> <p>Posted by <a href="#">Sanne van Gils-Goedee</a></p> <p>11/19/2022</p> <p><b>Boost</b></p>		Article	All followers	1,113	-	11	0.99%
<p><a href="https://www.linkedin.com/feed/update/urn:li:activity:699938885323546624">https://www.linkedin.com/feed/update/urn:li:activity:699938885323546624</a></p> <p>Posted by <a href="#">Sanne van Gils-Goedee</a></p> <p>11/18/2022</p> <p><b>Boost</b></p>		Repost	All followers	544	-	17	3.13%
<p>Erster weiblicher Crashtest-Dummy: Eva soll Autos für Frauen sicherer machen</p> <p>Posted by <a href="#">Sanne van Gils-Goedee</a></p> <p>11/17/2022</p> <p><b>Boost</b></p>		Article	All followers	1,043	-	29	2.78%
<p>Today was the first day of the carhs training gmbh Human #Modeling and #Simulation...</p> <p>Posted by <a href="#">Sanne van Gils-Goedee</a></p> <p>11/16/2022</p> <p><b>Boost</b></p>		Image	All followers	561	-	70	12.48%
<p>The report mentioned <a href="#">[link]</a> describes the development of the Seat Evaluation Tools...</p> <p>Posted by <a href="#">Sanne van Gils-Goedee</a></p> <p>11/15/2022</p> <p><b>Boost</b></p>		Repost	All followers	279	-	27	9.68%

## 2.6 Workshops

The consortium organised events for stakeholders and technical users. Ranging from demonstrations as part of the consultation meetings with our Advisory Group and the International Group (our project benefitted of external guidance consisting from highly skilled expert representatives of stakeholders) to dedicated events for technical users. The latter focussed on practical application and addressed technical topics on how to use the models, tools and protocols. These activities were provided in formats such as workshops and webinars, and even a hackathon.

The objective has always been to generate communication and events tailored to the needs of our stakeholders, approaching them through the channels they use.

### 2.6.1 Kick-off workshop

A kick-off workshop was organized (WP2) at the start of the project.

On 17 October 2018, VIRTUAL hosted an inspiring session on Open-Source Human Body Model Development at the Wissenschaftsforum-building in Berlin. The workshop attracted over 40 international experts on human body modeling.

The VIRTUAL workshop was organized in conjunction with the CARHS 7th International Symposium on "Human Modeling and Simulation in Automotive Engineering" taking place in Berlin on 18 and 19 October.

The key objectives were to present the project plan, create a base for the VIRTUAL community and identify the needs of present and future stakeholders within the community.

In the final discussion we received a range of valuable advice and comments. University representatives were very grateful for our open-source approach that provides them with easily accessible models that can be used in student projects.

The minutes of this meeting, Milestone 2.1, can be found online.

[projectvirtual.eu/wp-content/uploads/2018/11/minutes-VIRTUAL-Workshop-Berlin-October-17-2018-11-01-1.pdf](https://projectvirtual.eu/wp-content/uploads/2018/11/minutes-VIRTUAL-Workshop-Berlin-October-17-2018-11-01-1.pdf)



We made a catchy video in which project partners and workshop attendees summarised the outcome of the WP2 workshop held in Berlin. The video also explains the VIRTUAL project and the impact aimed to have.




The news items and the video were communicated through our website, newsletter and social media: [projectvirtual.eu/2018/10/30/about-virtual-and-human-body-model-development/](https://projectvirtual.eu/2018/10/30/about-virtual-and-human-body-model-development/) | [www.youtube.com/watch?v=WcBaRxiI1WI](https://www.youtube.com/watch?v=WcBaRxiI1WI)

## Workshop: Open Source Human Body Model Development

17 October '18 16:30 - 17 October '18 18:30

This event is sold out

### Contact



[sanne.van.gils@swov.nl](mailto:sanne.van.gils@swov.nl)  
+31 (0)70 317 3304

### About this event

The recently started EU-project VIRTUAL (<https://projectvirtual.eu>) invites experts interested in Human Body Modeling. The event is free of charge. The workshop is held in conjunction with the Human Modeling and Simulation conference, October 16-19 in Berlin (<https://www.carhs.de/en/human-modeling-overview.html>).

VIRTUAL's objective is to provide procedures and open access tools to assess the benefit of novel safety systems. The project started on June 1st 2018 and will continue until May 31st 2022. The goal is to establish an European based global hub for Open Source Virtual Testing and to demonstrate its success in traffic safety. Open Source Human Body Models (OS-HBMs) of both men and women will be made available in a format that can be morphed to represent different ages and sizes. The models will represent car occupants, vulnerable road users and users of public transport.

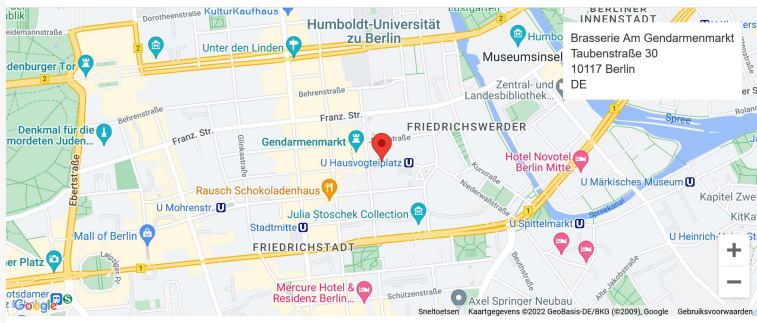
This workshop will give an overview of the VIRTUAL project and present the challenges we face today. We aim to create a versatile basic model that allows for future refinements in an open source environment - which stakeholders from all over the world are welcome to use - to further develop the HBM. In parallel we will create a sustainable web-based where the HBMs can be freely downloaded. We will also initiate a community and encourage users to share their experience, model refinements and advice with the community. Our long term goal is that we, together with the stakeholders, will jointly provide a HBM that can be morphed/scaled and is therefore suitable to represent any human length, gender, age, BMI, posture etc. The HBM will be divided into sections which allows users to refine one body section and then attach it to the full HBM.

**Tentative agenda:**

- 16:30 Welcome, short introductions of the participants.
- 16:45 Overview of the VIRTUAL project.
- 17:00 Presentation of current challenges in the VIRTUAL project with focus on the modeling principles of the HBM and the open source concept. We will present our current status and thoughts on how we can achieve our ambitions to make the HBM possible to morph and adapt, and to make it computationally efficient and robust.
- 17:30 Short presentations from participants (also external) on other research activities/projects that are of relevance to the VIRTUAL project.
- 17:50 Discussion, questions and input from the participants.
- 18:30 **End** of the workshop. **Informal dinner** with possibility for continued discussion.

We look forward to welcoming you!

Mats Svensson, on behalf of the VIRTUAL consortium  
[mats.svensson@chalmers.se](mailto:mats.svensson@chalmers.se)





## 2.6.2 Mid-term workshop

On 10 September 2019 the H2020-projects OSCCAR and VIRTUAL held a pre-conference (IRCOBI) workshop on Virtual Testing and open-source Human Body Models.

Around 80 experts from various fields connected to virtual testing came together in Florence to discuss the opportunities and challenges of the application of HBMs in virtual safety assessments for internal product development. Strategies were discussed on how to overcome barriers and bottle necks for facilitating maximum use of HBMs.

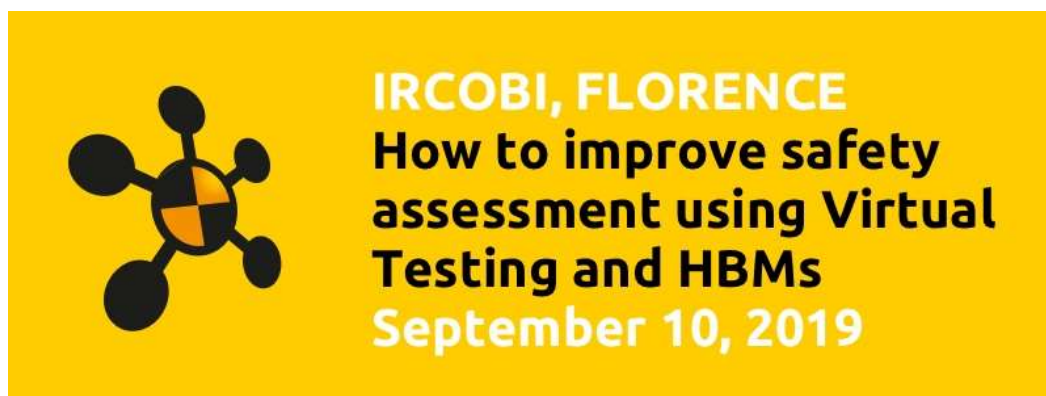
In small groups certain topics were discussed, such as:

- expectations from Virtual Testing (VT) in safety assessment of new vehicles
- what are the needs and bottle necks from an industrial user perspective

The event announcement, news item and the video were communicated through our website, newsletter and social media:

Announcement and programme:

[projectvirtual.eu/2019/04/11/ircobi-pre-conference-workshop/](https://projectvirtual.eu/2019/04/11/ircobi-pre-conference-workshop/)





**Virtual Testing and Open Source Human Body Modelling**  
 How to improve safety assessment using Virtual Testing and HBMs? - two projects, two approaches

IRCOBI venue, Firenze, September 10<sup>th</sup> 2019

**Programme**

Time	Topic	Speaker
09:00-09:15	VIRTUAL and OSCCAR in very brief, the HBMs use and how the results of the projects can/will be used in Virtual Testing	Astrid Linder Werner Leitgeb
09:15-09:45	Expectations from Virtual Testing (VT) in safety assessment of new vehicles: IIHS and Euro NCAP	Marcy Edwards Michiel van Ratingen
09:45-10:15	Increasing HBM application - What are the needs and bottle necks from an industrial user perspective?	Lotta Jakobsson Yuichi Kitagawa
10:15-10:25	Experiences from the open-access approaches in our field	Philippe Beillas
10:25-10:30	Outline for small group discussion	Corina Klug
10:30-10:45	COFFEE BREAK	
10:45-11:25	Small group discussions: A – Chances and Challenges of the application of HBMs in virtual safety assessments for internal product development B – Strategies to overcome barriers and bottle necks for facilitating maximum use of HBMs	13 small groups
11:30-12:10	Presentations from group discussions (summary of results by group leader à 3 min)	Group leaders
12:10-12:30	General discussion Conclusions from the workshop	Astrid Linder Werner Leitgeb
12:30	END	

[www.projectvirtual.eu](http://www.projectvirtual.eu)

[www.osccarproject.eu](http://www.osccarproject.eu)

News item: [projectvirtual.eu/2019/09/24/video-how-to-improve-safety-assessment-using-virtual-testing-and-human-body-models/](http://projectvirtual.eu/2019/09/24/video-how-to-improve-safety-assessment-using-virtual-testing-and-human-body-models/)

## VIDEO: How to improve safety assessment using Virtual Testing and Human Body Models?



by VIRTUAL on September 24, 2019



### IRCOBI Europe: pre-conference workshop by OSCCAR and VIRTUAL

On 10 September 2019 Horizon2020 projects OSCCAR and VIRTUAL organised a pre-conference workshop on Virtual Testing and open-source Human Body Models. The goal of the workshop was to gather the thoughts and ideas from experts and stakeholders within the virtual testing community.

Around 80 world experts from various fields connected to virtual testing came together in Florence to discuss the chances and challenges of the application of HBMs in virtual safety assessments for internal product development. Strategies were discussed on how to overcome barriers and bottle necks for facilitating maximum use of HBMs.

[Home](#)
[Work Packages](#)
[Consortium](#)
[Publications](#)
[News](#)
[Events](#)
[Contact](#)

- what are the needs and bottle necks from an industrial user perspective

The [presentations](#) that were given are now available online.

Listen to what these experts in virtual testing have to say regarding virtual testing and the outcome of this workshop.



Video containing interviews with project partners and advisory group members:

[youtu.be/vvcFc5g8nbs](https://youtu.be/vvcFc5g8nbs)



### 2.6.3 Hands-on workshop

Around 30 participants from around the world have participated in this hands-on workshop 'Introduction to the VIVA+ models and OpenVT Platform' which took place online on 10 September 2020.

After an introduction of VIRTUAL (Astrid Linder), the OpenVT platform (Arne Keller) and the current status of the VIVA+ models (Johan Iraeus), a beta-version of the current VIVA+ models was handed out to the participants. Jobin John had set up an interactive session, where everyone was able to get started with Git and learned what stage, commit, push and pull means. The final result showed that the majority of the participants was able to complete the task, so that we ended with a merged participant list on our exercise repo. Finally, Martin Schachner and Corina Klug tried to clarify what this all has to do with Jupyter. Our idea of postprocessing validation load cases in a harmonized way was presented.

The takeaway message of the workshop was clear: everyone is welcome to contribute! Contribution can be done on different levels: ask for help in our communication channels (Zulip), correct a typo in the documentation, create an issue, enhance the model or provide additional validation load cases.

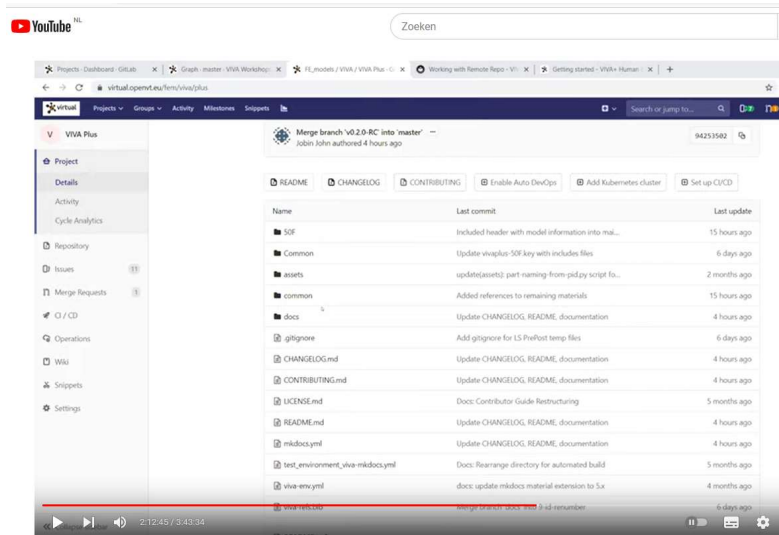
The news items and the video were communicated through our website, newsletter and social media:

News item: [projectvirtual.eu/2020/09/11/introduction-to-the-viva-models-and-openvt-platform](https://projectvirtual.eu/2020/09/11/introduction-to-the-viva-models-and-openvt-platform)

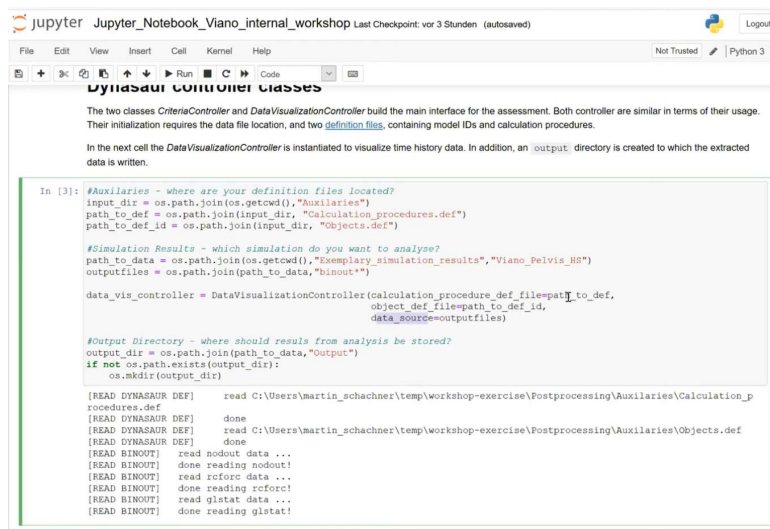
The workshop was recorded and can be viewed on YouTube:

[www.youtube.com/watch?v=N83d7zUBgB0](https://www.youtube.com/watch?v=N83d7zUBgB0)





VIRTUAL hands-on workshop: Introduction to the VIVA+ models and OpenVT Platform



## 2.6.4 CBA tool workshop

The VIRTUAL webinar 'Cost-benefit analysis tool for innovative automotive safety systems' (WP6) was held online on 27 May 2021, which attracted 38 experts from around the world.

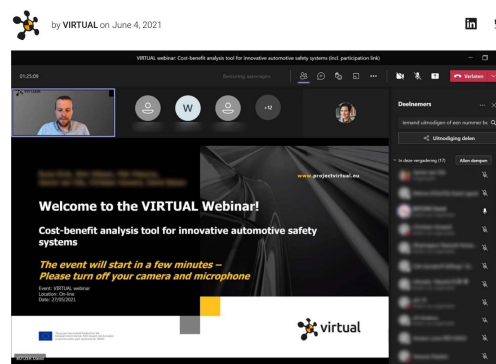
People interested in cost-benefit analysis of automotive safety systems were invited: vehicle safety, including road safety policy makers, vehicle manufacturers, road safety NGOs, vehicle assessment organizations, fleet owners and vehicle safety researchers.

The audience was asked what developments are necessary in their view to improve the tool for their application. The consensus was that without having applied the tool, it is difficult to answer this question. At this stage there is no obvious component missing. However, an illustrative example and predefined input values and/or data sources were mentioned as helpful.

Vice versa many questions were raised towards the developers of the tool, regarding, for example, data sources and estimates for the tool. How is exposure/crash risk considered? The questions helped to make the tool more user friendly and easier to use.

A report including the Q&A from the webinar (to improve the tool) has been published on our website: [projectvirtual.eu/2021/06/04/cost-benefit-analysis-tool-for-innovative-automotive-safety-systems/](https://projectvirtual.eu/2021/06/04/cost-benefit-analysis-tool-for-innovative-automotive-safety-systems/)

## Webinar: Cost-benefit analysis tool for innovative automotive safety systems



On 27 May 2021 the webinar on cost-benefit analysis (CBA) was held via Microsoft Teams, which attracted 38 experts from around the world. People and institutions with interests in cost-benefit analysis of automotive safety systems were invited: vehicle safety, including road safety policy makers, vehicle manufacturers, road safety NGOs, vehicle assessment organisations, fleet owners and vehicle safety researchers.

The aim of the webinar was to present and explain the preliminary CBA tool and getting feedback from the experts on applicability of the tool.

In the first part the VIRTUAL project was presented, an introduction to CBA for automotive systems was given and the preliminary CBA tool was presented and explained (see slides for more information).

In the second part participants were asked what they would use the tool for in their organisation. Most of the participants can imagine using the tool in research for example for injury/collision reduction strategies for cyclists. The tool could be used in communication with policies and consumer rating.

The audience was also asked what developments are necessary in their view to improve the tool for their application. The consensus was that without having applied the tool, it is difficult to answer this question. At this stage there is no obvious component missing. However, a go-through example and predefined input values and/or data sources were mentioned as helpful.

Vice versa many questions were raised towards the developers of the tool. In focus were for example data sources and estimates for the tool. How is exposure/crash risk considered? Etc. The questions will help to make the tool more user friendly and easier to use.

Please find all questions and answers from this webinar below.

### Questions from VIRTUAL towards participants

#### What would you use the CBA tool for in your organisation?

- We may use it in research activities, related to CBAs
- To evaluate socio economical benefits
- Research & Development
- CBAs

The overview of all our workshops can be found on our website:

Search Results for: workshop



### IRCOBI HBM workshop

Join us online next week for an exciting post-IRCOBI workshop dedicated to applications of human body...

Events



### WTO workshop: role of gender in the development of standards

In the eighth Triennial Review members of the World Trade Organization agreed to hold a workshop...

News



### VIRTUAL online workshop

Introduction to the VIVA+ models and OpenVT Platform – How can everyone contribute? This online workshop...

Events



### Workshop VIRTUAL-OSCCAR

Progress in Virtual Testing for automotive applications The workshop is jointly organized by the EU-funded research...

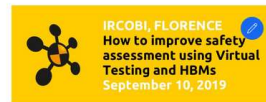
Events



### Input request: workshop 'Virtual Testing and Open Source Human Body Modelling'

For the preparation of the workshop 'Virtual Testing and Open Source Human Body Modelling' we would...

News



### IRCOBI: pre-conference workshop by OSCCAR and VIRTUAL

Date & time: Tuesday 10 September, 9.00-12.30 Location: IRCOBI, University of Florence How to improve safety...

April 11, 2019



### Fruitful workshop on Open Source Human Body Model development

On 17 October 2018, VIRTUAL hosted an inspiring session on Open Source Human Body Model Development at...

News



### Workshop on OS-HBM Development

The VIRTUAL Consortium kindly invites experts interested in Human Body Modeling to attend. This workshop will...

News



### VIRTUAL Workshop: Open Source Human Body Model Development

VIRTUAL kindly invites experts interested in Human Body Modeling to join this workshop. The event is free of charge. The workshop is held in conjunction with the Human Modeling and Simulation conference, October 18-19 in Berlin.

Events



### VIVA+ online hackathon

From 23 September to 14 October the VIVA+ online hackathon took place, bringing together the Open...

News



### VIRTUAL VIVA+ online hackathon

Join VIRTUAL's international Open Science community of Human Body Model users and developers from academia and...

Events



### Gender Summit Europe

The 21st Gender Summit will take place online on 14-16 April. It will mark the 10th...

Events

## 2.7 Events

We organized various workshop and events through-out the projects' lifetime. To stimulate interest in the VIRTUAL approach, the consortium partners seized all opportunities to inform stakeholders; they regularly engaged in face-to-face conversations to get feedback on project achievements. A report of each event is in the News section of our website.

### 2.7.1 Mid-term review meeting

A mid-term review meeting with the International Group was planned to take place from 24-26 June at SWOV, in The Hague. Due to Covid-19 this was rescheduled to September, however traveling was still problematic for some countries. Instead, the meeting took place online.

### 2.7.2 Final event

Our final event, in the form of a cluster of meetings and presentations, took place in September 2022 in Porto. At this event, the main project outputs were presented including our exploitation plans. It was organized in conjunction with the IRCOBI conference, where our main target audiences come together yearly. Attendees could exchange knowledge and experiences, see tangible results and discuss initiatives and visions.

On Tuesday, VIRTUAL hosted a hybrid meeting for HBM4VT (a framework of international experts to develop a roadmap for Human Body Model usage in Virtual Testing) as part of its final event to discuss their vision on improving vehicle safety by using human body models in virtual testing protocols. The mutual understanding was that collaboration is needed to get to the next level of traffic safety for the whole population, requiring a community approach. Experts from Japan, China, the US and Europe attended the meeting, both in person as well as online.

Watch our video, and the [presentations](#), summarizing the outcome of this meeting. [youtu.be/zVWbzWR4oA](https://youtu.be/zVWbzWR4oA)





The final results video (animation) was presented at the conference, integrated in a video loop, highlighting our developments.

It proved to be a major success. The cluster of meetings proved to be a great format for us. The after-lunch sweets, custom-made M&Ms, which we had at our booth we're a really nice way to share the new OVTO.org URL in a refreshing and fun way after our daily booth presentation.



**IRCOBI 2022 | Porto**  
**Showcasing project**  
**results:**  
**VIVA+, OVTO, SET**  
**14-16 September 2022**



**IRCOBI 2022 | Porto, Portugal**  
**Showcasing VIRTUAL project results:**  
**VIVA+, OVTO, SET**  
**14-16 September 2022**

VIRTUAL kindly invites you to visit our booth at the [IRCOBI Conference](#), which will be held in Portugal from September 14 to 16 September. The Horizon2020 project VIRTUAL will showcase some of its results and exploitation plans during this exciting conference.

**What can you expect**

Every day during the conference we will have presentations during the lunch breaks at 1 pm. The presentations will focus on our developments of the VIVA+ and SET models. In addition, the organization OVTO that has been established to further develop the results of the VIRTUAL project will be presented. We look forward to seeing you at our booth in Porto!

**Booth Programme**

14 September 2022, 1 pm: Presentation OVTO and SET

15 September 2022, 1 pm: Presentation OVTO and VIVA+

**Location**

Alfandega Conference Centre  
Rua Nova da Alfândega  
Edifício da Alfândega  
4050-430 Porto



*VIVA+ models*



*SET models*



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 768960.

[projectvirtual.eu](http://projectvirtual.eu) | [openvt.eu](http://openvt.eu)

Join the conversation: follow us on [Twitter](#) and [LinkedIn](#)

## 2.8 Scientific publications

All scientific publications stemming from VIRTUAL are available on our website (see image below): [projectvirtual.eu/dissemination](https://projectvirtual.eu/dissemination)

The focus of the publications is on advances in human body modelling, validation, and injury assessment, particularly for crash scenarios not covered by existing regulations and physical testing.

The complete overview can be found in Chapter 4.3 of this document.

### Papers/ Articles / Communications

- **ESV paper** (*submitted | under review*)  
Comparison of injury predictors and kinematics of Human Body Models representing average female and male road users in car crashes
- **Transport Research Arena conference Lisbon** (November 2022 | *submitted*)  
Socio-economic costs and benefits of vehicle safety systems
- **Frontiers in Future Transportation** (November 2022)  
[Integrity of Virtual Testing for Crash Protection](#)
- **IRCOBI proceedings** (September 2022)  
[The Influence of Occupant's Size, Shape and Seat Adjustment in Frontal and Side Impacts](#)
- **IRCOBI proceedings** (September 2022)  
[Finite Element Human Body Models to study Sex-differences in Whiplash Injury: Validation of VIVA+ passive response in rear-impact](#)
- **IRCOBI proceedings** (September 2022)  
[An Open-Source Finite Element Model of a Generic Car Seat: Development and Validation for Low-Severity Rear Impact Evaluations](#)
- **IRCOBI proceedings** (September 2022)  
[Effects of Boundary Conditions and Posture on Simulations with Human Body Models of Braking Events](#)
- **IRCOBI proceedings** (September 2022)  
[The influence of occupant's size and shape in frontal and side impacts for varying seat positions](#)
- **IRCOBI proceedings** (September 2022)  
[Finite Element Human Body Models to study Sex-differences in Whiplash Injury: Validation of VIVA+ passive response in rear-impact](#)
- **IRCOBI proceedings** (September 2022)  
[Development of a 50th Percentile Female Femur Model](#)
- **IRCOBI proceedings** (September 2022)  
[Analysis of head and neck kinematics of the VIVA+ and THUMS V5 HBM in a generic rear-impact simulation](#)
- **IRCOBI proceedings** (September 2022)  
[An Open-source Finite Element model of a generic car seat: Development and validation for low-severity rear impact evaluations](#)
- **VTI report | Seat Evaluation Tools (SETs)**  
[Development of prototype concepts of the SETs of an average female and male for low severity rear impact crash testing](#)
- **Traffic Injury Prevention** (September 2022)  
[Effects of restraint parameters using PIPER 6y in reclined seating during frontal impact](#)
- **Frontiers in Bioengineering and Biotechnology** (July 2022)  
[Hello, world! VIVA+: A human body model lineup to evaluate sex-differences in crash protection](#)




## 2.9 Conferences and presentations

Consortium members who attended conferences, represented the VIRTUAL project through posters, podium presentations, demonstrations, panel discussions and of course in face-to-face meetings. Communication materials and actions were prepared and provided to support partners.

Written summaries, pictures, social media posts, videos and links to the supporting documents can be found on our website, either in the News section or the Publications page.

Some examples:

- In November 2022 we were successfully presented at TRA 2022 in Lisbon. Wim Wijnen (WP6) had a poster session and gave a live demonstration of our CBA tool. The VIRTUAL cost-benefit tool includes several novel elements as compared to standard cost-benefit analysis in the field of road safety.



**POSTER SESSION**  
 Wim Wijnen | W2Economics  
 David Bützer | AXA  
 Rune Elvik, Petr Pokorný | TØI  
 Contact: wim.wijnen@w2economics.com

### Socio-economic costs and benefits of vehicle safety systems

**INTRODUCTION**  
 A cost-benefit analysis tool was developed in the Horizon 2020 project VIRTUAL. The tool is aimed at calculating the socio-economic costs and benefits of vehicle safety systems. It provides insight in the costs of vehicle safety systems, the safety impacts, quality of life gains, monetary benefits and socio-economic return. The tool serves to support road safety stakeholders in making decision on developing, introducing and implementing (new) vehicle safety systems or new regulations and legislation.


**KEY FEATURES OF THE TOOL**

- Safety impacts of vehicle safety systems are assessed using a detailed classification of injuries (39 injury groups).
- A linkage with Human Body Models is established to estimate injury prevention. HBMs simulate the impacts of a collision on the human body, resulting in impact on injury probability and severity.
- Safety impacts are translated into quality of life gains, using QALYs (Quality Adjusted Life Years).
- Both case-specific user inputs (e.g. crash risks) and fixed inputs (e.g. monetary valuations) are used in the calculations.

**CASE STUDIES**  
 The cost-benefit tool has been applied in the VIRTUAL project to assess the costs and benefits of several vehicle safety systems:

- Autonomous Emergency Braking (AEB) systems, aimed at preventing car-pedestrian and car-cyclist collisions or reduce injury severity.
- Improved seat designs in passenger cars, aimed at reducing whiplash associated disorders.
- Improved tram fronts to reduce the severity of tram-pedestrian injuries.

The case studies illustrate the feasibility and added value of the novel elements, such as using HBMs in cost-benefit analysis and translating HBM results into QALYs.



Input	Measure: Whiplash protection seat			Results			
	base	best estimate	upper	base	best estimate	upper	
<b>Costs per vehicle</b>				<b>Total costs</b>	€ 32	€ 47	€ 60
- Development costs	€ 15	€ 20	€ 25	<b>Number of injuries prevented</b>			
- Manufacturing costs	€ 10	€ 15	€ 20	- Yearly	0,005	0,013	0,026
- Repair/replacement costs after a crash	€ 50	€ 70	€ 100	- Total vehicle lifetime	0,008	0,010	0,020
				- Injury prevented per ... vehicle	126	51	26
<b>Crash risk (change crashes per vehicle per year)</b>				<b>Quality of life improvement (QALY)</b>			
- before intervention	0,012	0,012	0,012	- Yearly	0,003	0,007	0,015
- after intervention	0,012	0,012	0,012	- Total vehicle lifetime	0,004	0,011	0,022
				- QALY gained per ... vehicles	225	90	46
<b>Road user characteristics</b>				<b>Benefits</b>			
- Number of target road users per vehicle	1			- Quality of life gains	€ 247	€ 622	€ 1.220
- Average age calculator: - male	40			- Medical cost reduction	€ 24	€ 50	€ 114
- female	40			- Productivity gains	€ 117	€ 294	€ 577
- Life expectancy: - male	78			- Total benefits	€ 388	€ 976	€ 1.913
- female	82			<b>Socio-economic return</b>			
- Proportion male target road user	60%			- Net present value	€ 328	€ 628	€ 1.040
<b>Vehicle life time (years)</b>	15			- Benefit-cost ratio	6	21	50
<b>Discount rate</b>	5,0%						

**VIRTUAL PROJECT**  
 The objective of the VIRTUAL project is to improve the safety of road users by providing procedures and open access tools to assess the benefit of new safety systems | <https://projectvirtual.eu/>

HOSTED AND ORGANIZED BY: ANI, WZL  
 CO-ORGANIZED BY: EU, ENGINHARIA, MAGELLAN  
 TOGETHER WITH: ALICE, EIT, OETRA

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 752950.

The VTI stand showcased world's first crash dummy, SET50F, based on an average woman, developed within our project. It attracted many curious booth visitors, bringing up questions and helping us show the obvious...



- This is the flyer we made for the 3rd Global Ministerial Conference on Road Safety in Sweden (2020). Astrid Linder (VTI) talked about 'Human Body Models'.



**3RD GLOBAL MINISTERIAL CONFERENCE ON ROAD SAFETY** | **ACHIEVING GLOBAL GOALS 2030 STOCKHOLM 19-20 FEB 2020**

Sweden is to host the 3rd Global Ministerial Conference on Road Safety on 19-20 February 2020 in Stockholm. The conference marks the end of the UN Decade of Action for Road Safety 2011-2020 and the starting point for continued collaboration on road safety. The aim is to reach global consensus on guidelines for continued international collaboration on road safety up to 2030. SAFER has been awarded the honorary task of arranging two agenda items in the official program.

**Borderless research to save lives – a dinner event on how Vision zero can be addressed by collaboration**  
The participants will receive a summary from SAFER Vehicle and Traffic Safety.

understanding on one of the key mechanisms behind how to improve traffic safety through a successful collaboration model between society, industry, academia and research organisations.

Presentations by SAFER partners will take place to help contribute to the understanding about the success factors behind collaboration as a key tool to save lives in traffic. On behalf of VIRTUAL, project coordinator Astrid Linder (VTI) will be present to talk about 'Human Body Models'.

Read more about the global UN conference:  
<https://www.road.safetysweden.com/>

**virtual** | **Open access virtual testing protocols for enhanced road user safety**

The overall objective of the VIRTUAL project is to improve the safety of road users by providing guidelines and open access tools to assess the benefits of road safety systems. Open Access Human Body Models (HBM) which models of men and women are developed in a format that is suitable to represent all different ages and sizes for:

- car occupants,
- roller-skate road users (ORL),
- pedestrians,
- cyclists,
- and standing occupants in public transport.

The human body models are developed to be used in a simulation tests, in which physical road testing is supplemented with virtual testing (VT) in order to identify the best performing safety innovations.

**Models** | **Open VT platform** | **Global activities**

VTI, as the project coordinator, is leading the development of the HBM and the Open VT platform. The goal is to provide the HBM and the Open VT platform to the road safety community. The HBM and the Open VT platform are developed in a format that is suitable to represent all different ages and sizes for:

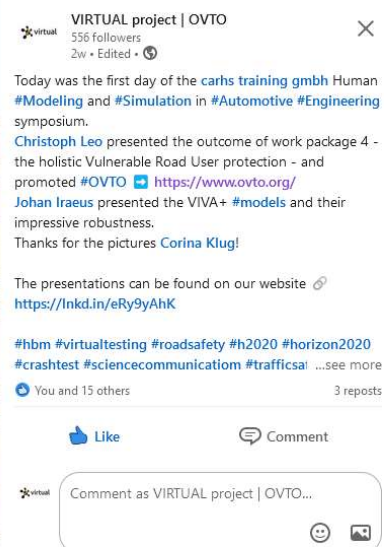
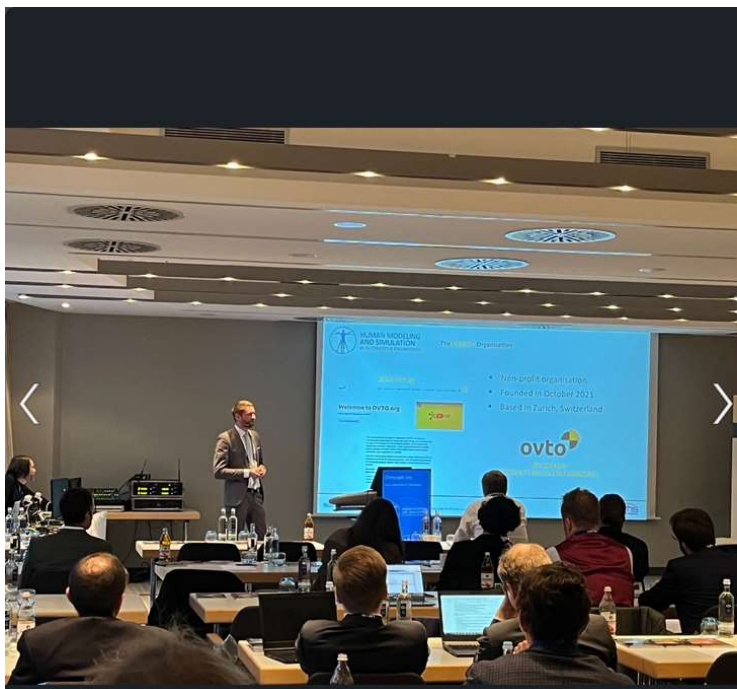
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**Partners:** VTI, CHALMERS, TU Delft, AGU, faurecia, STN, SYMA, EOT, SIEMENS, SIEL, AVANCE, projectvirtual.eu

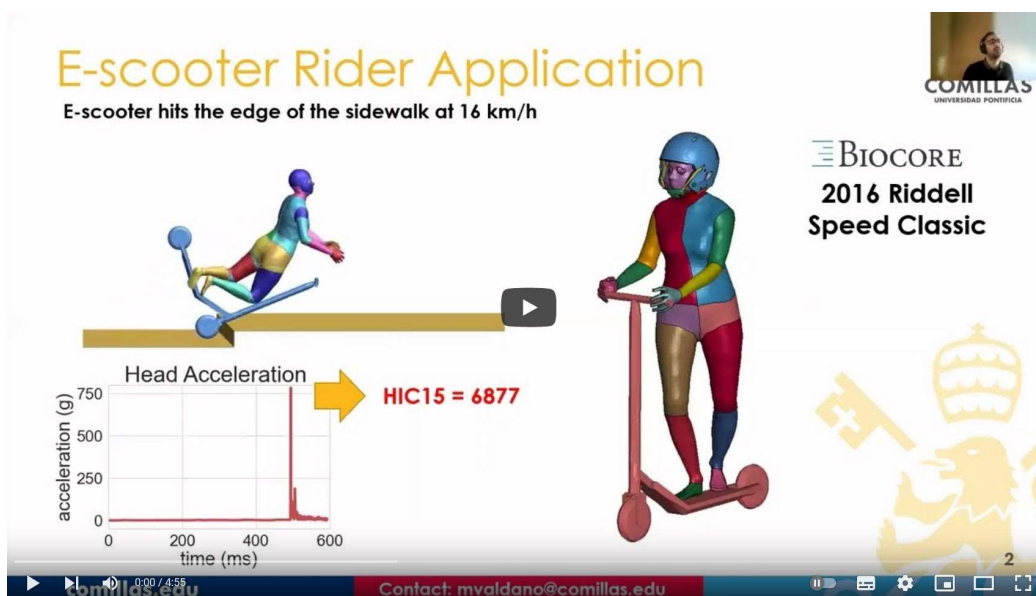
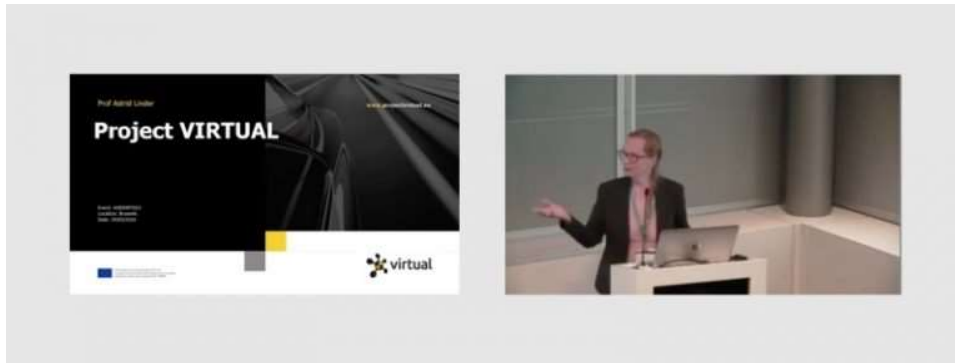
- Protection of road users still is a preoccupation, high on the agenda of road transport research: how to make roads safer for all users?  
At the H2020RTR21 conference (March 2022), three projects – OSCCAR, VIRTUAL and PIONEERS – addressed the challenges and presented solutions.



- VIRTUAL held two presentations at the Carhs training Human Modeling and Simulation in Automotive Engineering symposium (2022).  
Christoph Leo presented the outcome of Work Package 4 'the holistic Vulnerable Road User protection' and promoted OVTO.  
Johan Iraeus presented the VIVA+ models and their impressive robustness.



The complete overview of public (conference) presentations can be found on our website: [projectvirtual.eu/dissemination/minutes-of-meeting/](https://projectvirtual.eu/dissemination/minutes-of-meeting/)



VIRTUAL project | VIVA+ online hackathon IRCOBI | HBM applications

## Minutes of meeting & presentations

Below you will find an overview of all public presentations and meeting minutes:

### **16 November 2022 – Poster presentation TRA 2022**

[VIRTUAL cost-benefit analysis tool | Socio-economic costs and benefits of vehicle safety systems](#)

### **16-17 November 2022 – 9th International Symposium: Human Modeling and Simulation in Automotive Engineering, ed. CARHS**

[The VIRTUAL Holistic Vulnerable Road User Safety Assessment Robustness Evaluation and Application Examples of the VIVA+ Models](#)

### **13 September 2022 – HBM4VT meeting**

[Virtual Testing with Human Body Models – global initiatives \(coming soon\)](#)

### **20-21 September 2022 – SafetyUpDate Graz, ed. CARHS**

[Open Access Virtual Testing with Human Body Models](#)

### **19 November 2021 – Presentation IROCBI workshop**

[Post-conference workshop: Human Body Modeling Applications in Biomechanics](#)

### **27 May 2021 – Presentation webinar CBA-tool**

[Cost-benefit analysis tool for innovative automotive safety systems](#)

### **18 May 2021 – 1st Virtual Testing: Human Modeling in Pedestrian Protection, ed. CARHS**

[VIRTUAL Integrated Assessment of VRU safety](#)

### **18 March 2021 – Annual conference of the Society for Benefit-Cost Analysis**

[Economic valuation of preventing non-fatal road injuries: a literature review](#)

### **20 November 2020 – Presentation from the Human Modeling Symposium**

[VIVA+ Open Human Body Models for Virtual Testing](#)

### **8 September 2020 – Presentations from the VIRTUAL-OSCCAR workshop**

[01 – VIRTUAL, Astrid Linder](#)

[02 – VIRTUAL, Arne Keller](#)

[03 – VIRTUAL, Johan Iraeus](#)

[04 – VIRTUAL, Corina Klug](#)

[05 – OSCCAR, Werner Leitgeb et al](#)

[06 – Euro NCAP, Michiel van Ratingen](#)

[07 – IIHS, Marcy Edwards](#)

[08 – Toyota THUMS, Tjark Kreuzinger](#)

### **17-18 September 2019 – Presentation from SafetyUpDate Graz, ed. CARHS**

[Assessment of Vulnerable Road User Protection with Human Body Models](#)

### **17 October 2018 – Minutes of Meeting**

[Workshop on Open Source Human Body Model Development](#)

## 2.10 General (non-scientific) publications

Since road safety measures are known to generate a lot of public debate, it is clear that the general public is interested in the VIRTUAL projects' research results. Our project serves as a strong example of how scientific research and innovation has the potential improving the safety of all (European) citizens.

In some cases our project name is not explicitly mentioned, but parts of our research results were referred to in one way or the other. Some examples:

- Artist Tora Schultz's show 'Bitch on Wheels' (until 28 Jan 2023 at O-Overgaden, Copenhagen) is a surreal, witty take on a world designed for the male body. One of the key works is the prototype of a female crash test dummy, designed by project partner VTI. Aptly called 'Eva' or 'Eve' in English after the first woman, 'her destiny is pretty tragic,' Schultz reflects. 'Her job is to crash into a wall.'

Image from the opening of the exhibition: 'prototype EvaRid 50F' with Tora and Astrid Linder.



- In February 2022 Discover Magazine published an article on female models in crash tests, for which also Astrid Linder was interviewed. Some highlights from the article:

*Except for minor differences, most car requirements around the world call for similar test procedures - but none of them use a dummy that represents an average female. "We need a reality check," says Astrid Linder, an engineer, researcher, director of traffic safety at Swedish National Road and Transport Research Institute, and a professor at Chalmers University. Linder has been a leader in the push for accurate female crash-test modeling worldwide for years. "And that reality consists of females and males — therefore we need representations of females and males in our tests."*

*Linder has worked with other European researchers to develop EvaRID, the first average female model. EvaRID is a virtual model of a dummy, and she's meant for low-severity, rear-impact crash testing to prevent whiplash, another disproportionate problem for female drivers. Virtual modeling doesn't always yield results that are as concrete as physical tests, but it allows much more flexibility in simulating car crashes with varying body types. To Linder, however, it's quite simple: "What should already have happened, and what should happen very soon, is that society is clear that men and women are equally important."*

- We took up on global recurring dates such as International Women’s Day.

## Women and Road Safety: Are We on Track to Meet SDG Target 3.6?

On 9 March 2022, Astrid Linder covered VIRTUAL in the session ‘Deep Dive on Product Development: Crash Test Dummies’. Safety equipment in vehicles, such as headrests, seatbelts, and airbags, have been traditionally designed based on a male crash test dummy. This has serious implications and this session looked at different measures to address these, including female crash test dummies and how to bridge data gaps.

### SCIENCE THAT MATTERS

New efforts to improve safety for women have been underway for years, but there’s still no female dummy that represents their bodies. A new line of crash-test dummies called **THOR** have been available for six to 10 years, but have yet to be officially adopted by NHTSA or IIHS safety rating systems. That’s according to Chris O’Connor, the president and CEO of Humanetics, the company producing THOR and other crash-test dummies. They are truer to male and female human bodies in shape and have as many as 100 more sensors to collect data than the Hybrid III family. The female version actually has a female-shaped pelvis bone and breasts — but is still 5th percentile in size.

Linder has worked with other European researchers to develop EvaRID, the first average female model. EvaRID is a virtual model of a dummy, and she’s meant for low-severity rear-impact crash testing to prevent whiplash, another disproportionate problem for female drivers. Virtual modeling doesn’t always yield results that are as concrete as physical tests, but it allows much more flexibility in simulating car crashes with varying body types.

EvaRID weighs as much as an average female, has corresponding weight distribution, geometry, and even an approximation of muscle strength in the neck to model whiplash injuries. Linder says that because this model wasn’t as widely used as she had hoped, she is working on another initiative to develop a virtual model of actual humans rather than dummies. A version of the new ViVA+ virtual average female model is open source and will be **available** this year. Linder says there has been broad interest from around the world.

- We have been creative in reaching our target audiences. This is an advertorial we placed in Automotive CAE Companion 2019-2020 (page 45):



- The UN Special Envoy for Road Safety, Jean Todt, launched the book "THE ROAD AHEAD, 26 voices for Safe and Sustainable Mobility" with support from the UN Road Safety Fund this year (2022). The book includes a selection of essays from leading specialists, members of government, public figures, and other promoters of road safety. Project partner SWOV was asked to contribute to the book and wrote the analytical synopsis for the chapter 'Gender equality and road safety', referring to our research (page 121).

*Article 8 of the Treaty of the Functioning of the European Union reads, "In all its activities, the Union shall aim to eliminate inequalities, and to promote equality, between men and women. "Designers may believe they are making products for everyone, but their safety performances are only assessed for the male part of the population. It is time to start designing women in! It is imperative that the female part of the population is represented by new occupant models, i.e. crash test dummies and Human Body Models representing the average female. Recent research shows the progress in the assessment of car occupant safety as more diverse Human Body Models and dummy prototypes have been developed. These models and dummies illustrate that the knowledge concerning the female part of the population is available to be used in the same way as we do for the male part of the population.*

[roadsafetyfund.un.org/sites/default/files/downloads/resources/2022-06/The%20Road%20Ahead.pdf](https://roadsafetyfund.un.org/sites/default/files/downloads/resources/2022-06/The%20Road%20Ahead.pdf)



**4**  
**GENDER EQUALITY**  
 and Road Safety

**ANALYTICAL SYNOPSIS BY SWOV**

**A** safe road system is tailored to the diversity to road users: elderly, children, disabled, pregnant women, and non-white car... Another important aspect that may be overlooked when setting a target is diversity in gender. Men and women are different in many aspects, biologically, socially, and psychologically. The findings of differences between men and women are especially relevant for the safety of passengers. In particular, the gender safety features of passenger cars affect protection and have a large impact on the safety of occupants in case of a crash, especially when on the road for the women.

The reason that average car crash tests designed for the male part of the population: the average male or so-called reference man. To this day, the dummies used in regulatory crash tests have almost exclusively the size and constitution of an average man. The female part of the population is hardly represented in most performed by consumer information requirements such as the New Car Assessment Programme (NCAP).

Figure 4.1.1: The five average car occupant crash test dummies (SAE422-100) and the average car crash dummies (SAE422-100).

**It is imperative that the female part of the population is represented by new occupant models, i.e. crash test dummies and Human Body Models representing the average female. Recent research shows the progress in the assessment of car occupant safety as more diverse Human Body Models and dummy prototypes have been developed. These models and dummies illustrate that the knowledge concerning the female part of the population is available to be used in the same way as we do for the male part of the population.**



- Dutch Design Week 2022 at TU Eindhoven 'Designing a Just Digital Society', hosted by Pakhuis de Zwijger. Astrid Linder talked about the VIRTUAL project and her research of many years on addressing road safety for all (VRUs, in-vehicle, public transport users) and aiming to reduce the risk of losing their health or life. She also explained the Human Body Models (HBM) and their physical counterparts. The session explored how the issues of inequality and exclusion that are evident in the so-called real world can also emerge in the digital world. Technology is an undeniable force in our society, and this talk explored how we can make use of it in a way to promote just, inclusive digital spaces for all.



Astrid Linder at TU Eindhoven for DDW 2022: Designing a Just Digital Society

## 2.11 Media

According to plan we explored the potential of external media, blogs, non-scientific magazines and social media, and what these platforms had to offer in getting the message of the project across and for attracting the attention of technical users and stakeholders.

Having monitored LinkedIn groups, Twitter-feeds and being bold in linking people to our project we were able to grow our online community and even have some ambassadors, outside of the project. By constantly posting about our ongoing activities we naturally gained interest from local, national or European/international media. Various journalists wrote articles on the research topic and/or project, some even came to partners' facilities to interview and capture the impressive work on film. Also invitations for round-table talks and live casts reached us. Others interviewed (Astrid) by phone and/or asked us for material to use in their program.

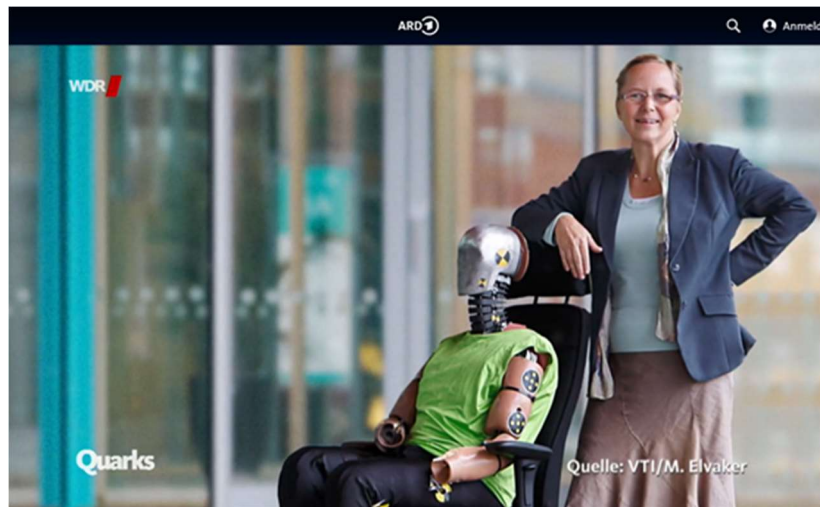
- VIRTUAL project coordinator Astrid Linder (VTI) was invited to speak during the TEDxKTHWomen event in Stockholm in December, 2018. Around 7m45 Astrid mentions the role of VIRTUAL in addressing this topic. [youtu.be/jv06vMYCgYY](https://youtu.be/jv06vMYCgYY)



- Astrid Linder on German national television, Das Erste (ARD): "HERstory". Although the VIRTUAL project is not explicitly mentioned, this broadcast clearly shows the importance of the work done by researchers like Astrid and Mats and all of the project's partners.



- In this edition Quarks (a broadcast by the German WDR) shows why it is vital to pay attention to differences between sexes. And why women have been disadvantaged in medicine for so long. Starting at 39m22 gender equality in crash testing is being discussed, giving attention to a part of Astrid Linder's research; EvaRid – the female crash test dummy.



- Astrid Linder: "The fragment in Leschs Kosmos shows the recent research progress in the assessment of occupant safety where we have developed both prototypes and virtual dummy models of average females as well as detailed virtual models, so called human body models. These models and dummies illustrate that the knowledge concerning the female part of the population is available to be used in the same way as we do for the male part of the population." ZDF – Leschs Kosmos: Gendern – Wahn oder Wissenschaft? (October 2021)

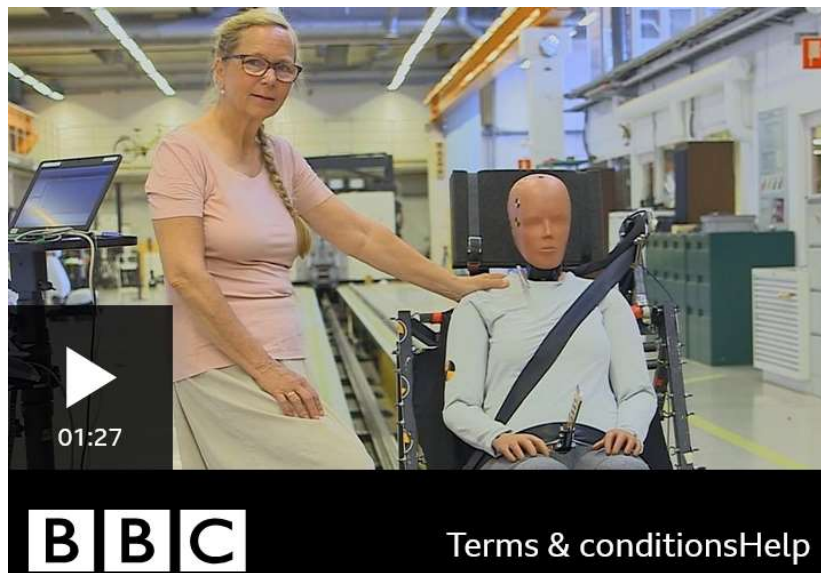


- On the 10th of September 2022 ZDF aired the program 'plan b – Gleich und gerecht'. Astrid Linder, VTI (from 6m52s to 10m32s) and also Lotta Jakobsson, Volvo Group (from 20.24s to 25m08s) explain about their achievements in the field of crash test data collection and creating safer car seats, reducing the higher injury risk for women. They continue fighting for equality/inclusivity, by doing scientific research showing authorities the necessity and possibilities for also testing with female dummies and human body models.



- BBC article (and video) on how technology could make vehicles safer for women. "We know from injury statistics that if we look at low severity impacts females are at higher risk. So, in order to ensure that you identify the seats that have the best protection for both parts of the population, we definitely need to have the part of the population at highest risk represented," Astrid told the BBC.

The UN is examining its regulations on crash testing and will determine whether they need to be changed to better protect all drivers. If changes are made to involve a crash test dummy representing the average female, there is an expectation that women will one day be safer behind the wheel. "My hope for the future is that the safety of vehicles will be assessed for both parts of the population," Dr Linder said.



- The German program Galileo broadcasted a clip on the 10th of November 2022, featuring our Seat Evaluation Tool (SET) with SET50F (Eva) and questioning the so called Gender Data Gap.



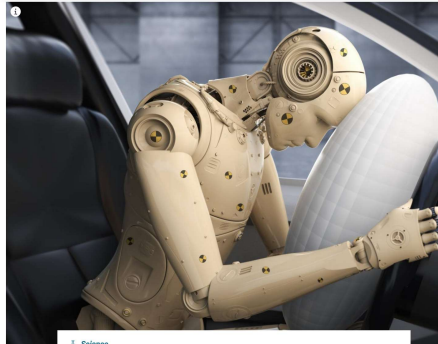
- Designing Cities for All - Design from Inclusion. Livecast (recorded) by Pakhuis de Zwijger. In crash test laboratories, the average male is the norm of the crash test dummy representing the human in the crash. According to Astrid Linder occupant diversity of both males and females should be addressed when designing and evaluating vehicle safety systems. [dezwijger.nl/programma/designing-cities-for-all-9](https://dezwijger.nl/programma/designing-cities-for-all-9)



- How can computer simulations help to improve #safety for everyone? Efforts are being made in this direction as part of the European New Car Assessment Program (Euro NCAP, For Safer Cars), of which Austria has been a full member since this year.

Accident researcher Corina Klug from Universität Graz deals with these. "In the computer simulation, we are not limited to a few standard load cases, but can also investigate what happens outside the standard sizes of #crashtest #dummies. In this way, it can be examined whether larger, smaller, thinner, obese and older people are equally well protected in the #vehicle," she tells futurezone.

The newsitem is in German → [futurezone.at/science/fahrzeugsicherheit-auto-crashtest-dummy-frauen-corina-klug-tu-graz-max-lang-oeamtc/402019071](https://futurezone.at/science/fahrzeugsicherheit-auto-crashtest-dummy-frauen-corina-klug-tu-graz-max-lang-oeamtc/402019071)



Science

## Wie Autos für Frauen sicherer werden können

25.05.2022

Andrea Iossa

Wo Crashtest-Dummys versagen, können Computersimulationen helfen, um auch weibliche Auto-Insass\*innen besser zu schützen.



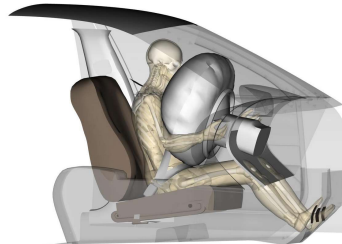
Frauen werden bei technischen Entwicklungen oft nicht mitbedacht. Im Automobilbereich werden sie etwa bei der Konzeption von Rückhaltesystemen wie Gurten oder Airbags sowie von **Crashtest-Dummys**, die bei der Simulation von Unfällen zum Einsatz kommen, nicht von Anfang an berücksichtigt. In der Regel werden Crashtests mit dem sogenannten **50-Prozent-Mann** simuliert, der den Durchschnittsmaßen eines Mannes entspricht.

Das kann gravierende Nachteile für Frauen haben. Laut einer aktuellen britischen Studie bleiben sie im Falle eines Unfalls fast doppelt so häufig im Auto eingeklemmt wie Männer. Denn Frauen haben tendenziell ein breiteres Becken und sitzen näher am Lenkrad, wodurch die Einklemmgefahr steigt.

### Neue Bestrebungen

Die EU will die Anforderungen an die Fahrzeugsicherheit daher verschärfen. Im Rahmen des **European New Car Assessment Programme (Euro NCAP)**, bei dem Österreich seit heuer Vollmitglied ist, gibt es Bestrebungen in diese Richtung. Besonders Computersimulationen werden relevanter.

Mit diesen beschäftigt sich die Unfallforscherin **Corina Klug** von der **TU Graz**. „In der Computersimulation sind wir nicht auf ein paar Standardfälle begrenzt, sondern können auch untersuchen, was abseits der Standard-Größen von Crashtest-Dummys passiert. So kann untersucht werden, ob größere, kleinere, dünnere, beliebtere und ältere Personen im Fahrzeug gleich gut geschützt werden“, sagt sie der futurezone.



© TU Graz/ISI

Mit einem virtuellen Menschmodell könne zudem die Anatomie viel detaillierter abgebildet und das Verletzungsrisiko genauer abgeschätzt werden, weil etwa direkt Dehnungen im Knochen analysiert werden können. Sowohl das Unfallszenario als auch die Person, die im Fahrzeug sitzt, könnten in der Simulation zudem variieren und Rückhaltesysteme noch realistischer ausgelegt und bewertet werden.

### Erstes Modell einer „Durchschnittsfrau“

Im Rahmen des **EU-Projekts VIRTUAL** wurde auch das erste Menschmodell einer „Durchschnittsfrau“ entwickelt. Sowohl die äußere Geometrie als auch die Form und Dicke der Knochen basiere auf statistischen Modellen. Die Daten sind dabei zentral. Klug: „Die virtuellen Menschmodelle sind immer nur so gut wie die Daten, die zu ihrer Entwicklung und Validierung verwendet werden können.“

Es sei begrüßenswert, wenn es auf diesem Gebiet mehr Forschungsförderung gebe, um mehr Daten zu generieren und Modelle weiter zu verbessern. Die TU Graz und Euro NCAP arbeiten laut Klug intensiv daran, virtuelles Testen für den Insassenschutz zu implementieren. Die virtuellen Menschmodelle stehen laut der Forscherin für 2029 auf der Agenda.

Werbung

Corina Klug (TU Graz) featured in FutureZone.

## 3 Visibility of EU funding

**VIRTUAL followed the rules regarding visibility of EU funding in the framework of Horizon 2020.**

All communication materials and publications related to this project showed the European Union emblem and indicated that VIRTUAL has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 768960.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 768960

**48**

MONTHS

**15**

PARTNERS

**8**

WORK PACKAGES

#### Funding

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 768960.



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#### Pages

- About
- News
- Events
- Work Packages
- Publications & presentations
- Consortium
- Abbreviations
- Contact
- Subscribe to newsletter
- Privacy statement

#### Project Coordinator

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## 4 Activities & achievements

### 4.1 Project awareness indicators to date

Project awareness indicators	Number
Total number of people reached – unique website visitors	13,300
Number of Twitter followers	183
Number of LinkedIn company page followers	556
Number of LinkedIn group members	240
Newsletters subscriptions	186
LinkedIn page – impressions (number for last 365 days)	43,000
Scientific publications	32
Conference presentations	25
OSCCAR - VIRTUAL workshop: Progress in Virtual Testing for automotive applications Number of views: <a href="https://youtu.be/gyUdLk_DeTg">youtu.be/gyUdLk_DeTg</a>	316
Number of views: <a href="https://youtu.be/WcBaRxiI1WI">youtu.be/WcBaRxiI1WI</a> VIRTUAL workshop: Open source Human Body Model development (Oct. 2018)	540
Number of views: <a href="https://youtu.be/vvcFc5g8nbs">youtu.be/vvcFc5g8nbs</a> How to improve safety assessment using Virtual Testing and Human Body Models? (Sep. 2019)	549
Number of views: <a href="https://youtu.be/OMIe7HaERZs">youtu.be/OMIe7HaERZs</a> Animated project video	237
Number of views: <a href="https://youtu.be/N83d7zUBgB0">youtu.be/N83d7zUBgB0</a> Introduction to the VIVA+ models and OpenVT Platform	282
Total number of VIRTUAL video views to date:	1,400+

### 4.2 Communication actions

Tool	Amount
Number of newsletters (News Flash) sent	11
Tweets	116
LinkedIn page updates, incl. reposts	80+
Project videos created (available in YouTube playlist)	17
Number of press clippings mentioning VIRTUAL project	55+
Number of events/workshops organised	10+
Number of news items on VIRTUAL website	70



## 4.3 Publications & presentations - overview

The project research results have been published in following scientific publications:

### Year 1, 2019

#### Publications, Year 1

- Elvik R (2019) Risk of non-collision injuries to public transport passengers: Synthesis of evidence from eleven studies, *Journal of Transport & Health*, [Volume 13](#), June 2019, Pages 128-136, [doi.org/10.1016/j.jth.2019.03.017](https://doi.org/10.1016/j.jth.2019.03.017).
- Linder A, Svedberg W (2019) Review of average sized male and female occupant models in European regulatory safety assessment tests and European laws: Gaps and bridging suggestions, *Accident Analysis & Prevention*, [Volume 127](#), June 2019, Pages 156-162, [doi.org/10.1016/j.aap.2019.02.030](https://doi.org/10.1016/j.aap.2019.02.030).
- Linder A, Svensson M (2019) Road Safety: Vehicle Occupant Safety Assessment and the Average Male as Norm, *Special issue of Interdisciplinary Science Review on Gender and Science*, [doi.org/10.1080/03080188.2019.1603870](https://doi.org/10.1080/03080188.2019.1603870).
- Silvano A P and Ohlin M (2019) NON-COLLISION INCIDENTS ON BUSES DUE TO ACCELERATION AND BRAKING MANOEUVRES LEADING TO FALLING EVENTS AMONG STANDING PASSENGERS, *Journal of Transport & Health*, JTH\_2019\_91\_R2, [doi.org/10.1016/j.jth.2019.04.006](https://doi.org/10.1016/j.jth.2019.04.006).

The project research results have been presented at following (scientific) conferences:

#### Conference presentations, Year 1

- Silvano A P and Linder A (2019) Falling of standing passengers on public transport: what makes us fall? A literature review, *Presentation at Transportforum*, Linköping Sweden, 9-10 January.
- Linder A, Östh J, Brolin K, and Svensson M (2018) The development of open source human body models for virtual testing of low severity vehicle safety: The ViVA model and the VIRTUAL project, JSAE Annual Congress (Spring), Yokohama Japan, 23-25 May.
- Linder (2018) The development of an open source human body model of an average female, ViVA, for low severity vehicle safety assessment. SIMBIO-M conference. Keynote, Stratford-Upon-Avon UK, 18-19 June.
- WP4 methods and results presented at AAAM Conference 2019, Madrid.
- WP4 methods and results presented at IRCOBI Conference 2019, Florence.
- WP4 methods and results presented at SafetyUpDate Conference 2019, Graz.

The project research outputs have been disseminated through a variety of channels, with the intention of maximizing reach and impact among stakeholders, media and thus the general public, growing awareness of our activities contributing to the UN sustainable development goals.

#### Other activities, Year 1

- Meeting with Euro NCAP, Leuven Belgium, 24 January 2019.
- TEDX talk on 6 Dec 2018: [projectvirtual.eu/2019/01/14/female-crash-test-dummy-tedxkthwomen-event/](https://projectvirtual.eu/2019/01/14/female-crash-test-dummy-tedxkthwomen-event/)
- VIRTUAL workshop: OS-HBM development, Berlin Germany, 17 October 2018.
- Joint VIRTUAL-OSCCAR-PIONEER (MG 3.2 funded projects) meeting, Athens Greece, 12 September 2018.
- Kick-off press conference with all Swedish partners (in Swedish), Stockholm Sweden, 14 June 2018.



- Presentation at JSAE Impact Biomechanics Experts Committee workshop, Linder A.: The development of open source human body models for virtual testing of low severity vehicle safety: The VIVA model and the VIRTUAL project. Tokyo Japan, 22 May 2018.

## Year 2, 2020

### Publications, Year 2

- Leo, C., Klug, C., Ohlin, M. and Linder, A. (2019), "Analysis of pedestrian injuries in pedestrian-car collisions with focus on age and gender", 2019 IRCOBI Conference Proceedings, Florence, Italy, 11.-13.9.2018, IRCOBI, pp. 256–257.
- Leo, C., Klug, C., Ohlin, M., Bos, N., Davidse, R. and Linder, A. (2019), "Analysis of Swedish and Dutch accident data on cyclist injuries in cyclist-car collisions", Traffic injury prevention. doi: 10.1080/15389588.2019.1679551.
- Submitted for IRCOBI 2020 → to be published in online proceedings in September: David Bützer, Stefan Lang, Kai-Uwe Schmitt, Bettina Zahnd, Corina Klug: "Knee injuries in pedestrians and cyclists resulting from impacts with passenger cars – Frequency and associated factors based on Swiss insurance claims data".
- Katarina Bohman, Ronja Örtlund, Gustav Kumlin Groth, Pernilla Nurbo, Lotta Jakobsson (2020) Evaluation of users' experience and posture in a rotated swivel seating configuration, Traffic Injury Prevention (submitted - awaiting final approval).

### Conference presentations, Year 2

- Borderless research to save lives – a dinner event on how Vision zero can be addressed by collaboration. Side event to the 3rd Ministerial UN conference on road safety. Attended/presented by Chalmers, Volvo and VTI.
- VÄGEN FRAMÅT FÖR ÖKAD JÄMSTÄLLDHET: VILKA VERKTYG FÖR JÄMSTÄLLD TRAFIKSÄKERHET ÄR UNDER UTVECKLING? - [vti.divaportal.org/smash/get/diva2:1411216/FULLTEXT01.pdf](https://vti.divaportal.org/smash/get/diva2:1411216/FULLTEXT01.pdf) at Transportforum.
- DAGENS LAGSTIFTNING FÖR UTVÄRDERING AV KROCKSKYDD – ENDAST MÄN [vti.divaportal.org/smash/get/diva2:1411216/FULLTEXT01.pdf](https://vti.divaportal.org/smash/get/diva2:1411216/FULLTEXT01.pdf) at Transportforum.
- WP4 methods and results presented at Human Modelling and Simulation in Automotive Engineering Conference 2020, online.

### Other activities, Year 2

- Launch of the preliminary Cost Benefit Analysis tool: [virtual.openvt.eu/cost-benefit-analysis/cost-benefit-tool](https://virtual.openvt.eu/cost-benefit-analysis/cost-benefit-tool) (May 2020) (M6.2 & M.1.7)
- Webinar 'Equality in the transport system': [www.youtube.com/watch?v=EMgpGMVEZGg&feature=youtu.be](https://www.youtube.com/watch?v=EMgpGMVEZGg&feature=youtu.be) (May 2020)
- Kinematics evaluation of female head-neck model with reflexive neck muscles in low-speed rear impact. Online presentation by Chalmers at the virtual edition of the SIMBIO-M conference.
- A video was made by us at IRCOBI 2019 in Florence, capturing the view/statements of our stakeholders/advisory board members on the challenges and opportunities of virtual testing using human body models.

## Year 3, 2021

### Publications, Year 3

- Schubert, A.; Erlinger, N.; Leo, C.; Iraeus, J.; John, J.; Klug, C. (2021): Development of a 50th Percentile Female Femur Model; IRCOBI Conference Proceedings – Accepted for publication.
- Klug, C. Iraeus, J., John, J.; Svenning E.; Kranjec M.; Svensson M.; Leo, C.; Schubert, A.; Linder, A. (2021): Introduction of the VIVA+ Vulnerable Road User Models; carhs conference on Human Modeling and Simulation in Automotive Engineering, 20.11.2021, online. [projectvirtual.eu/wp-content/uploads/2020/11/2020-11-20\\_Klug\\_et\\_al\\_VIVAVRU.pdf](https://projectvirtual.eu/wp-content/uploads/2020/11/2020-11-20_Klug_et_al_VIVAVRU.pdf)
- Carlsson, A., Horion, S., Davidsson, J., Schick, S., Linder, A., Hell, W., & Svensson, M. Y. (2021). Dynamic Responses of Female Volunteers in Rear Impact Sled Tests at Two Head Restraint Distances. *Frontiers in Bioengineering and Biotechnology*, 9, 477. [doi.org/10.3389/fbioe.2021.684003](https://doi.org/10.3389/fbioe.2021.684003)
- Carlsson, A., Davidsson, J., Linder, A., Svensson, M.Y. (2021). Design and Evaluation of the Initial 50th Percentile Female Prototype Rear Impact Dummy, BioRID P50F – Indications for the need of an additional dummy size. *Frontiers in Bioengineering and Biotechnology* *Work done in this reporting period - Accepted for publication 21 June 2021*
- Johan Iraeus, Pooja Umeshkumar, Dag Thuvesen, Lauren Meredith, Mats Svensson (2021) A METHOD TO ADAPT Q- SERIES CHILD ATD INJURY RISK CURVES TO THE PIPER HUMAN BODY MODEL. (journal submission)
- Bohman, Katarina, et al. "Evaluation of users' experience and posture in a rotated swivel seating configuration." *Traffic injury prevention* (2020): 1-6. [doi.org/10.1080/15389588.2020.1795149](https://doi.org/10.1080/15389588.2020.1795149)
- Leo, Christoph; Rizzi, Maria C.; Bos, Niels M.; Davidse, Ragnhild J.; Linder, Astrid; Tomasch, Ernst; Klug, Corina (2021): Are There Any Significant Differences in Terms of Age and Sex in Pedestrian and Cyclist Accidents? In: *Front. Bioeng. Biotechnol.* 9. DOI: [10.3389/fbioe.2021.677952](https://doi.org/10.3389/fbioe.2021.677952)
- Bützer, David; Lang, Stefan; Schmitt, Kai-Uwe; Zahnd, Bettina; Klug, Corina (2020): Knee injuries in pedestrians and cyclists resulting from impacts with passenger cars –Frequency and associated factors based on Swiss insurance claims data. In: *International Research Council on the Biomechanics of Injury (Hg.): 2020 IRCOBI Conference Proceedings. IRCOBI Conference. postponed (online). International Research Council on the Biomechanics of Injury: IRCOBI (IRCOBI Conference Proceedings), S. 37–46. [www.ircobi.org/wordpress/downloads/irc20/pdf-files/12.pdf](https://www.ircobi.org/wordpress/downloads/irc20/pdf-files/12.pdf).*
- Schachner, Martin; Sinz, Wolfgang; Thomson, Robert; Klug, Corina (2020): Development and evaluation of potential accident scenarios involving pedestrians and AEB-equipped vehicles to demonstrate the efficiency of an enhanced open-source simulation framework. In: *Accident Analysis & Prevention* 148, S. 105831. [doi.org/10.1016/j.aap.2020.105831](https://doi.org/10.1016/j.aap.2020.105831)
- Xu J.-C., Silvano A.P., Nusia J., Krašna S., Keller A., Klug C., Thomson R., Linder A.: A biomechanical quantification of an effective balance recovery strategy in free-standing females and males using OpenSim. Short communication paper, accepted for Proceedings of IRCOBI 2021 Conference, 6.–9. September 2021.

### Conference presentations, Year 3

- Presentation of OpenVT platform (WP1) at two workshops in conjunction with IRCOBI 2020.
- John, J; Iraeus, J.; Svensson, M; Klug, C; Linder, A; (2020) "VIVA+ Open Human Body Models for Virtual Testing" Automotive CAE Grand Challenge, Hanau, Germany.
- Levallois I, Rečko P, Bohman K, Renaudin F. "Novelty seating positions in automated vehicles: opportunities and challenges for child seats", *Protection of Children in Cars, 17th International Conference, December 5 – 6, 2019, Munich, Germany.*



- Linder A, Davidse R J, Iraeus J, John J D, Keller A, Klug C, Krašna S, Leo C, Ohlin M, Silvano A P, Svensson M, Wågström L, Schmitt K-U (2020). VIRTUAL - a European approach to foster the uptake of virtual testing in vehicle safety assessment, 8th Transport Research Arena TRA 2020, April 27-30, 2020, Helsinki, Finland. [projectvirtual.eu/wp-content/uploads/2020/03/VIRTUAL-TRA-2020-Linder-et-al\\_12Mar20.pdf](https://projectvirtual.eu/wp-content/uploads/2020/03/VIRTUAL-TRA-2020-Linder-et-al_12Mar20.pdf)
- Webinar: TRB Standing Committee on Women and Gender in Transportation (AME20), 14.04.2021 [projectvirtual.eu/2021/03/31/webinar-trb-standing-committee-on-women-and-gender-in-transportation-ame20/](https://projectvirtual.eu/2021/03/31/webinar-trb-standing-committee-on-women-and-gender-in-transportation-ame20/)
- WP4 methods and results presented at Virtual Testing - Human Modeling in Pedestrian Protection Conference 2021 online.
- WP4 methods and results presented at IRCOBI Conference 2021, online.
- SEGVAUTO symposium, 17-18 November 2021, online.  
INSIA (UPM) is organizing this symposium for the 2nd time. In over 35 presentations a large part of the results obtained within the SEGVAUTO program 4.0-CM will be presented. During the symposium some of the work done in WP5 (safety of public transport users) will be presented.

### Other activities, Year 3

- Presentation of WP2 on the VIRTUAL-OSSCAR workshop, 08.09.2021, online [projectvirtual.eu/wp-content/uploads/2020/09/03-Johan\\_VIRTUAL-OSSCAR-Workshop-WP2-Sep-2020\\_rev1.pptx](https://projectvirtual.eu/wp-content/uploads/2020/09/03-Johan_VIRTUAL-OSSCAR-Workshop-WP2-Sep-2020_rev1.pptx)
- Workshop "Introduction to the VIVA+ models and OpenVT Platform", 10.09.2021, online. [youtu.be/N83d7zUBgB0](https://youtu.be/N83d7zUBgB0)
- Webinar by WP6 on CBA-tool, 27.05.2021: [projectvirtual.eu/2021/06/04/cost-benefit-analysis-tool-for-innovative-automotive-safety-systems/](https://projectvirtual.eu/2021/06/04/cost-benefit-analysis-tool-for-innovative-automotive-safety-systems/)
- Road Safety Webinar (Sweden-Malaysia): Creating safer environment for vulnerable road users, 10.06.2021 - [projectvirtual.eu/2021/06/10/road-safety-webinar-creating-safer-environment-for-vulnerable-road-users/](https://projectvirtual.eu/2021/06/10/road-safety-webinar-creating-safer-environment-for-vulnerable-road-users/)
- Livecast – Design from Inclusion: Products & Services, 03.05.2021 - [projectvirtual.eu/2021/05/11/livecast-recording-design-from-inclusion-products-services/](https://projectvirtual.eu/2021/05/11/livecast-recording-design-from-inclusion-products-services/)
- WTO workshop: role of gender in the development of standards, 08.12.2020 - [projectvirtual.eu/2020/12/17/wto-workshop-role-of-gender-in-the-development-of-standards/](https://projectvirtual.eu/2020/12/17/wto-workshop-role-of-gender-in-the-development-of-standards/)
- Urban Mobility Days 2020, Innovation and city design for urban road safety - [projectvirtual.eu/2020/10/02/1296/](https://projectvirtual.eu/2020/10/02/1296/)
- Media performance: ZDF – Leschs Kosmos: Gendern – Wahn oder Wissenschaft? [www.zdf.de/wissen/leschs-kosmos/gendern-wahn-oder-wissenschaft-100.html](https://www.zdf.de/wissen/leschs-kosmos/gendern-wahn-oder-wissenschaft-100.html)

## Year 4, 2022

### Publications, Year 4

- ESV paper (**submitted | under review**)  
Comparison of injury predictors and kinematics of Human Body Models representing average female and male road users in car crashes
- Transport Research Arena conference Lisbon (**submitted**)  
Socio-economic costs and benefits of vehicle safety systems
- Frontiers in Future Transportation, 30 November 2022  
Integrity of Virtual Testing for Crash Protection by Esmā Galijatović, Maria Eichlseder, Simon Franz Heindl, Corina Klug. [doi.org/10.3389/ffutr.2022.914489](https://doi.org/10.3389/ffutr.2022.914489)
- IRCOBI proceedings (September 2022) - IRC-22-75

The Influence of Occupant's Size, Shape and Seat Adjustment in Frontal and Side Impacts

Alexandros Leledakis, Jonas Östh, Johan Iraeus, Johan Davidsson, Lotta Jakobsson

[www.ircobi.org/wordpress/downloads/irc22/pdf-files/2275.pdf](http://www.ircobi.org/wordpress/downloads/irc22/pdf-files/2275.pdf)

- IRCOBI proceedings (September 2022) - IRC-22-36  
Finite Element Human Body Models to study Sex-differences in Whiplash Injury: Validation of VIVA+ passive response in rear-impact  
Jobin D. John, I. P. A. Putra, Johan Iraeus  
[www.ircobi.org/wordpress/downloads/irc22/pdf-files/2236.pdf](http://www.ircobi.org/wordpress/downloads/irc22/pdf-files/2236.pdf)
- IRCOBI proceedings (September 2022) - IRC-22-38  
An Open-Source Finite Element Model of a Generic Car Seat: Development and Validation for Low-Severity Rear Impact Evaluations  
Jonny Genzel, Anna Carlsson, Astrid Linder, Bengt Pipkorn, Mats Svensson  
[www.ircobi.org/wordpress/downloads/irc22/pdf-files/2238.pdf](http://www.ircobi.org/wordpress/downloads/irc22/pdf-files/2238.pdf)
- IRCOBI proceedings (September 2022) - IRC-22-87  
Effects of Boundary Conditions and Posture on Simulations with Human Body Models of Braking Events  
N. Erlinger, D. Kofler, E. Heider, C. Klug  
[www.ircobi.org/wordpress/downloads/irc22/pdf-files/2287.pdf](http://www.ircobi.org/wordpress/downloads/irc22/pdf-files/2287.pdf)
- IRCOBI proceedings (September 2022) - IRC-22-75  
The influence of occupant's size and shape in frontal and side impacts for varying seat positions  
Alexandros Leledakis, Jonas Östh, Johan Iraeus, Johan Davidsson, Lotta Jakobsson  
[www.ircobi.org/wordpress/downloads/irc22/pdf-files/2275.pdf](http://www.ircobi.org/wordpress/downloads/irc22/pdf-files/2275.pdf)
- IRCOBI proceedings (September 2022) - IRC-22-36  
Finite Element Human Body Models to study Sex-differences in Whiplash Injury: Validation of VIVA+ passive response in rear-impact  
Jobin D. John, I. P. A. Putra, Johan Iraeus  
<http://www.ircobi.org/wordpress/downloads/irc22/pdf-files/2236.pdf>
- IRCOBI proceedings (September 2022) - IRC-21-38  
Development of a 50th Percentile Female Femur Model  
A. Schubert, N. Erlinger, C. Leo, J. Iraeus, J. John, C. Klug  
[www.ircobi.org/wordpress/downloads/irc21/pdf-files/2138.pdf](http://www.ircobi.org/wordpress/downloads/irc21/pdf-files/2138.pdf)
- IRCOBI proceedings (September 2022) - IRC-22-28  
Analysis of head and neck kinematics of the VIVA+ and THUMS V5 HBM in a generic rear-impact simulation  
Linus Trummler, Arne Keller, Kai-Uwe Schmitt, Markus Muser  
<http://www.ircobi.org/wordpress/downloads/irc22/pdf-files/2228.pdf>
- IRCOBI proceedings (September 2022) - IRC-22-38  
An Open-source Finite Element model of a generic car seat: Development and validation for low-severity rear impact evaluations  
Jonny Genzel, Anna Carlsson, Astrid Linder, Bengt Pipkorn, Mats Svensson  
[www.ircobi.org/wordpress/downloads/irc22/pdf-files/2238.pdf](http://www.ircobi.org/wordpress/downloads/irc22/pdf-files/2238.pdf)
- VTI report | Seat Evaluation Tools (SETs)  
Development of prototype concepts of the SETs of an average female and male for low severity rear impact crash testing  
Karemyr, M., Pettersson, T., Svensson, M., Linder, A.  
[vti.diva-portal.org/smash/record.jsf?pid=diva2%3A1709745&dsid=5172](http://vti.diva-portal.org/smash/record.jsf?pid=diva2%3A1709745&dsid=5172)
- Traffic Injury Prevention (September 2022)  
Katarina Bohman, Sarah El-Mobader & Lotta Jakobsson (2022) Effects of restraint parameters using PIPER 6y in reclined seating during frontal impact, Traffic Injury Prevention, DOI:  
[10.1080/15389588.2022.2125304](https://doi.org/10.1080/15389588.2022.2125304)
- Frontiers in Bioengineering and Biotechnology (July 2022)



- Hello, world! VIVA+: A human body model lineup to evaluate sex-differences in crash protection  
John J, Klug C, Kranjec M, Svenning E and Iraeus J (2022), Hello, world! VIVA+: A human body model lineup to evaluate sex-differences in crash protection.  
[www.frontiersin.org/articles/10.3389/fbioe.2022.918904/full](http://www.frontiersin.org/articles/10.3389/fbioe.2022.918904/full)
- Frontiers in Future Transportation (June 2022)  
Tram to Pedestrian Collisions – Priorities and Potentials  
Christian Lackner, Philipp Heinzl, Maria C. Rizzi, Christoph Leo, Martin Schachner, Petr Pokorny, Peter Klager, David Buetzer, Rune Elvik, Astrid Linder and Corina Klug.  
[doi.org/10.3389/ffutr.2022.913887](https://doi.org/10.3389/ffutr.2022.913887)

#### Conference presentations, Year 4

- 20-21 September 2022 - WP4 methods and results presented at Safety UpDate 2022, Graz.  
Open Access Virtual Testing with Human Body Models
- H2020RTR21 conference | Protection of road users - 29 March 2022  
During the 5<sup>th</sup> European conference on results from road transport R&I in H2020 projects (H2020RTR21 Conference. Astrid Linder represented VIRTUAL in Brussels: "More than 500 participants had registered for this conference. In addition to showing the results, the close collaboration with the OSCCAR project was highlighted and much appreciated by the audience".
- 16-17 November 2022 – 9th International Symposium: Human Modeling and Simulation in Automotive Engineering, ed. CARHS in Wiesbaden
  - The VIRTUAL Holistic Vulnerable Road User Safety Assessment
  - Robustness Evaluation and Application Examples of the VIVA+ Models
- IRCOBI conference, Porto | Daily (VIRTUAL) booth presentation on SET, VIVA+, OVTO  
Various scientific papers were presented during this conference, see conference proceedings above.
- Safety of Vehicle | Safety of Passenger conference 2022  
European conference on safety of bus, minibus and tram passengers | Warsaw May 17 – 18  
Multiple presentations on perceived and actual risks in buses & trams that VIRTUAL contributed to with information and solutions.
- Presentation at the PIARC (World Road Association) seminar. Presentation on the topic 'Gender inclusion and diversity' including focus on the work done within the VIRTUAL project.
- 16 November 2022 – Poster presentation CBA tool | TRA 2022 Lisbon (WP6)  
VIRTUAL cost-benefit analysis tool | Socio-economic costs and benefits of vehicle safety systems

#### Other activities, Year 4

- Presentation of VIRTUAL results at the VIRTUAL stand, IRCOBI 2022:  
OVTO, SET, VIVA+  
We created a video, capturing the view/statements of our stakeholders on virtual testing using human body models.
- UNECE Ad-hoc Group on "Data on Equitable Occupant Protection" (DEOP), supporting the Swedish chair Pernilla Bremer. Presentation of the VIRTUAL project and some of its main results, with a focus on the VIVA+ 50M and 50F models and the SET 50F and 50M.
- Women and Road Safety: Are We on Track to Meet SDG Target 3.6?  
On 9 March 2022, Astrid Linder covered VIRTUAL in the session 'Deep Dive on Product Development: Crash Test Dummies'. Safety equipment in vehicles, such as headrests, seatbelts, and airbags, have been traditionally designed based on a male crash test dummy. This has serious implications and this session looked at different measures to address these, including female crash test dummies and how to bridge data gaps.
- Our publication 'Are There Any Significant Differences in Terms of Age and Sex in Pedestrian and Cyclist Accidents?' won an award. For this publication the team received one of the five Mind the Gap Diversity Awards 2021 from Graz University of Technology, marking International Women's Day.

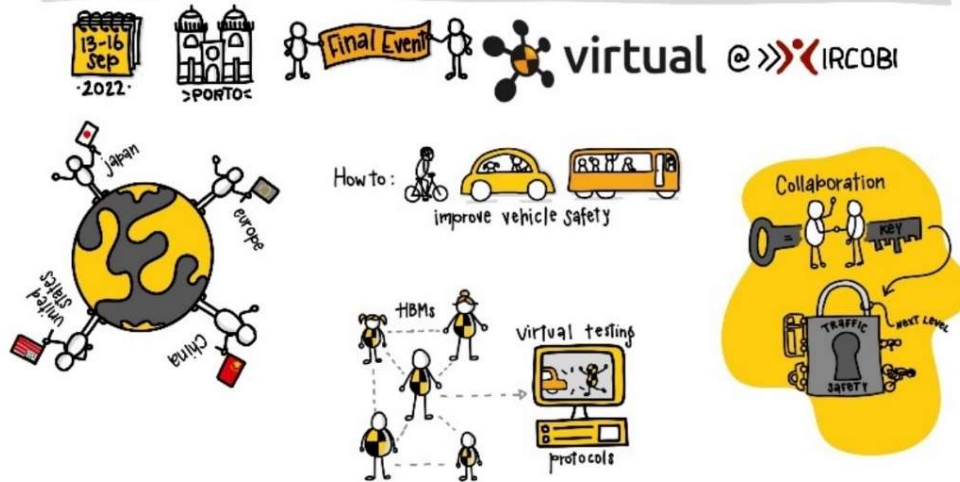
- Various media performances, such as:
  - ZDF 'plan b – Gleich und gerecht' (September 2022)  
[projectvirtual.eu/2022/09/10/equal-and-fair/](https://projectvirtual.eu/2022/09/10/equal-and-fair/)
  - German program Galileo. Crashtest mit Eva.  
[projectvirtual.eu/2022/11/25/galileo-crashtest-mit-eva/](https://projectvirtual.eu/2022/11/25/galileo-crashtest-mit-eva/)
  - BBC | The crash dummy aimed at protecting women drivers (October 2022).  
[www.bbc.com/news/technology-62877930](https://www.bbc.com/news/technology-62877930)



- 13 September 2022 – HBM4VT meeting (pre-conference meeting in Porto)  
Virtual Testing with Human Body Models – global initiatives  
From 13 to 16 September 2022, the VIRTUAL project partners gathered in Porto for a cluster of meetings and the IRCOBI conference. On Tuesday VIRTUAL hosted the HBM4VT meeting as part of its final event, bringing together an expert group from around the globe to discuss their vision on improving vehicle safety by using human body models in virtual testing protocols. The mutual understanding was that collaboration is needed to get to the next level of traffic safety for the whole population, requiring a community approach.

Visual notes of this meeting (see chapter 2.7.2) were within WP7.

## Virtual testing with Human Body Models - Global Initiatives



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 768960

## What is needed most urgently?







## 4.4 Dissemination overview

### June 2018

Press release – Newsdesk:

[amp-mynewsdesk-com.cdn.ampproject.org/c/s/amp.mynewsdesk.com/se/vti/pressreleases/svenska-organisationer-deltar-i-och-leder-stort-eu-projekt-om-trafiksaekerhet-och-krockprovning-2541220](http://amp-mynewsdesk-com.cdn.ampproject.org/c/s/amp.mynewsdesk.com/se/vti/pressreleases/svenska-organisationer-deltar-i-och-leder-stort-eu-projekt-om-trafiksaekerhet-och-krockprovning-2541220)

### July 2018

University of Ljubljana:

[www.fs.uni-lj.si/en/news\\_archive/2018072309540985/With](http://www.fs.uni-lj.si/en/news_archive/2018072309540985/With)

### August 2018

Nordic – project introduction:

[nordicroads.com/swedish-organisations-in-eu-project-on-traffic-safety-and-crash-testing/](http://nordicroads.com/swedish-organisations-in-eu-project-on-traffic-safety-and-crash-testing/)

Carhs – workshop announcement: [www.carhs.de/en/news/items/Pre-Conference-Workshop-on-Open-Source-Human-Body-Model-Development-8337.html](http://www.carhs.de/en/news/items/Pre-Conference-Workshop-on-Open-Source-Human-Body-Model-Development-8337.html)

### September 2018

SWOV – project introduction:

[www.swov.nl/en/news/eu-project-virtual-improving-road-safety-virtual-crash-tests/](http://www.swov.nl/en/news/eu-project-virtual-improving-road-safety-virtual-crash-tests/)

Safer Research - project introduction: [www.saferresearch.com/projects/virtual](http://www.saferresearch.com/projects/virtual)

VTI - workshop invitation: [www.vti.se/en/news/eu-project-virtual-improving-road-safety-with-virtual-crash-tests/](http://www.vti.se/en/news/eu-project-virtual-improving-road-safety-with-virtual-crash-tests/)



VTI – project introduction: [www.vti.se/en/news/swedish-organisations-in-eu-project-on-traffic-safety-and-crash-testing/](http://www.vti.se/en/news/swedish-organisations-in-eu-project-on-traffic-safety-and-crash-testing/)

#### **October 2018**

Monash University – project introduction:

[www.monash.edu/muarc/news-and-events/articles/muarc-joins-new-eu-project](http://www.monash.edu/muarc/news-and-events/articles/muarc-joins-new-eu-project)

#### **November 2018**

Safer newsletter – project introduction: [mailchi.mp/chalmers.se/b394u0zr19-2691737](http://mailchi.mp/chalmers.se/b394u0zr19-2691737)

#### **January 2019**

Carhs automotive CAE Grand Challenge 2019:

[www.carhs.de/en/conference\\_proceedings/product/automotive-cae-grand-challenge-2019.html](http://www.carhs.de/en/conference_proceedings/product/automotive-cae-grand-challenge-2019.html)

Carhs – rear impact HBM:

[www.carhs.de/en/news/items/VIRTUAL\\_simulates\\_Rear\\_Impact\\_with\\_the\\_ViVA\\_Human\\_Body\\_Model\\_9435.html](http://www.carhs.de/en/news/items/VIRTUAL_simulates_Rear_Impact_with_the_ViVA_Human_Body_Model_9435.html)

#### **February 2019**

Carhs newsletter: [www.carhs.de/newsletter-archive/caenews-2019-02-15-en.html](http://www.carhs.de/newsletter-archive/caenews-2019-02-15-en.html)

#### **September 2019**

Die Presse – news item: [www.diepresse.com/5689588/virtuelle-crashtests](http://www.diepresse.com/5689588/virtuelle-crashtests)

#### **October 2019**

Carhs – workshop IRCOBI / video:

[www.carhs.de/en/news/items/Video\\_How\\_to\\_improve\\_Safety\\_Assessment\\_using\\_Virtual\\_Testing\\_and\\_Human\\_Body\\_Models\\_11438.html](http://www.carhs.de/en/news/items/Video_How_to_improve_Safety_Assessment_using_Virtual_Testing_and_Human_Body_Models_11438.html)

SWOV – workshop IRCOBI / video:

[www.swov.nl/en/news/ircobi-europe-pre-conference-workshop-osscar-and-virtual](http://www.swov.nl/en/news/ircobi-europe-pre-conference-workshop-osscar-and-virtual)

Carhs - workshop IRCOBI / video:

[www.carhs.de/newsletter-archive/caenews-2019-10-15-en.html](http://www.carhs.de/newsletter-archive/caenews-2019-10-15-en.html)

#### **November 2019**

Benot Magazine – news item:

[www.benot.de/politik/autosicherheit-immer-nur-maennliche-crash-test-dummies-gefaehrden-frauen-a-76b3034e-31bf-4788-bbda-330658e73b1](http://www.benot.de/politik/autosicherheit-immer-nur-maennliche-crash-test-dummies-gefaehrden-frauen-a-76b3034e-31bf-4788-bbda-330658e73b1)

SWOV website – news item:

[www.swov.nl/en/news/analysis-swedish-and-dutch-accident-data-cyclist-injuries-cyclist-car-collisions](http://www.swov.nl/en/news/analysis-swedish-and-dutch-accident-data-cyclist-injuries-cyclist-car-collisions)

#### **April 2020**

Safer news - VIVA II has now been completed successfully

[www.saferresearch.com/news/viva-ii-has-now-been-completed-successfully](http://www.saferresearch.com/news/viva-ii-has-now-been-completed-successfully)

Webinar by 'Equality in the transport system':

[jamstalltransport.se/aktiviteter/webbseminarium-12-maj-trafiksakerheten-kan-lyftas-av-mer-jamstalldhetsfokus/](http://jamstalltransport.se/aktiviteter/webbseminarium-12-maj-trafiksakerheten-kan-lyftas-av-mer-jamstalldhetsfokus/)



Webinar recording: [www.youtube.com/watch?v=EMgpGMVEZGg&feature=youtu.be](https://www.youtube.com/watch?v=EMgpGMVEZGg&feature=youtu.be)

### May 2020

SafetyWissen – news item:

[www.safetywissen.com/object/A11/A11.gin7375493ypuao7qb742543sq6xw163724189743/safetywissen](https://www.safetywissen.com/object/A11/A11.gin7375493ypuao7qb742543sq6xw163724189743/safetywissen)

German television program mentioning the core of the VIRTUAL project: female crashtest dummy begins at 01:14:00:

[www.zdf.de/show/da-kommst-du-nie-drauf/da-kommst-du-nie-drauf-174.html](https://www.zdf.de/show/da-kommst-du-nie-drauf/da-kommst-du-nie-drauf-174.html)

### August 2020

SWOV newsletter - September 8, 2020: Online workshop: Progress in virtual testing for automotive applications (VIRTUAL): [mailchi.mp/bc3ecc92e9a1/fact-sheet-trucks-and-delivery-vans?e=e0c607b84b](https://mailchi.mp/bc3ecc92e9a1/fact-sheet-trucks-and-delivery-vans?e=e0c607b84b)

### September 2020

VIRTUAL newsletter: [us18.campaignarchive.com/?u=09def67f31bee53b2405b0fcb&id=dd38212140](https://us18.campaignarchive.com/?u=09def67f31bee53b2405b0fcb&id=dd38212140)

SWOV website:

[www.swov.nl/en/news/virtual-workshop-progress-virtual-testing-automotive-applications](https://www.swov.nl/en/news/virtual-workshop-progress-virtual-testing-automotive-applications)

### October 2020

Carhs Safety Update – Safetywissen website

Workshop:

[www.safetywissen.com/object/A11/A11.w1g737703pz172mIt2o40079u2n5ng63737492879/safetywissen](https://www.safetywissen.com/object/A11/A11.w1g737703pz172mIt2o40079u2n5ng63737492879/safetywissen)

Paper:

[www.safetywissen.com/object/A11/A11.19q737703wmjlip4nqj41550gehy7m63737494350/safetywissen?prev=%2Fnews%2FSAFETYNEWS%2F](https://www.safetywissen.com/object/A11/A11.19q737703wmjlip4nqj41550gehy7m63737494350/safetywissen?prev=%2Fnews%2FSAFETYNEWS%2F)

SWOV newsletter - VIRTUAL workshop: Progress in Virtual Testing for automotive applications:

[mailchi.mp/826116e87c1c/save-the-date-fersi-conference-2021?e=e0c607b84b](https://mailchi.mp/826116e87c1c/save-the-date-fersi-conference-2021?e=e0c607b84b)

### November 2020

SRF1 - Swiss TV documentary:

It was a part of a doc on the gender gap, one of the examples being the non-existence of a 50% female dummy. It is in Swiss German, but the drift of what I am saying is that there is a small chance that we will see a lot more physical dummies of various sizes, so the corresponding research must be done in the virtual world.

### December 2020

VTI - Professor of Traffic Safety appointed at VTI:

[www.vti.se/en/archives/news/archives/2020-12-09-professor-of-traffic-safety-appointed-at-vti](https://www.vti.se/en/archives/news/archives/2020-12-09-professor-of-traffic-safety-appointed-at-vti)

### February 2021

Discover Magazine - Why Are There No Crash Test Dummies That Represent Average Women?

[www.discovermagazine.com/technology/why-are-there-no-crash-test-dummies-that-represent-average-women](https://www.discovermagazine.com/technology/why-are-there-no-crash-test-dummies-that-represent-average-women)



### March 2021

Astrid Linder named Gender Star of the Year 2020 - Gender Equality Network in the transport sector  
[jamstalldtransport.se/aktuellt/astrid-linder-utsedd-till-arets-jamstalldhetsstjarna](http://jamstalldtransport.se/aktuellt/astrid-linder-utsedd-till-arets-jamstalldhetsstjarna)

### April 2021

Das Erste (ARD): "HERstory":  
[projectvirtual.eu/2021/08/17/herstory-lebensgefahr/](http://projectvirtual.eu/2021/08/17/herstory-lebensgefahr/)

### May 2021

Pakhuis de Zwijger - Design from Inclusion: Products & Services: [dezwijger.nl/programma/designing-cities-for-all-9](http://dezwijger.nl/programma/designing-cities-for-all-9)  
Livecast: [www.youtube.com/watch?v=SjrGfTT0B7g&feature=youtu.be](http://www.youtube.com/watch?v=SjrGfTT0B7g&feature=youtu.be)

SWOV website - Are there any significant differences in terms of age and sex in pedestrian and cyclist accidents? – WP4 publication: [www.swov.nl/en/news/are-there-any-significant-differences-terms-age-and-sex-pedestrian-and-cyclist-accidents](http://www.swov.nl/en/news/are-there-any-significant-differences-terms-age-and-sex-pedestrian-and-cyclist-accidents)

### June 2021

Quarks – WRD - Gefährliche Gleichbehandlung: Warum wir geschlechtsspezifische Medizin brauchen  
[www.ardmediathek.de/video/quarks/gefaehrliche-gleichbehandlung-warum-wir-geschlechtsspezifische-medizin-brauchen/wdr-fernsehen/Y3JpZDovL3dkci5kZS9CZWl0cmFnLWUyYjAwNDA1LTkZjgtNGUyYi1iZWY5LTE3NDM3ODU2YzdkMw/](http://www.ardmediathek.de/video/quarks/gefaehrliche-gleichbehandlung-warum-wir-geschlechtsspezifische-medizin-brauchen/wdr-fernsehen/Y3JpZDovL3dkci5kZS9CZWl0cmFnLWUyYjAwNDA1LTkZjgtNGUyYi1iZWY5LTE3NDM3ODU2YzdkMw/)

Fietsberaad CROW - Are There Any Significant Differences in Terms of Age and Sex in Pedestrian and Cyclist Accidents? (WP4 publication): [www.fietsberaad.nl/Kennisbank/Vrouwelijke-en-mannelijke-voetgangers-en-fietsers](http://www.fietsberaad.nl/Kennisbank/Vrouwelijke-en-mannelijke-voetgangers-en-fietsers) + [www.verkeerskunde.nl/artikel/verschillend-letselrisico-voor-mannen-en-vrouwen-op-de-fiets-en-te-voet](http://www.verkeerskunde.nl/artikel/verschillend-letselrisico-voor-mannen-en-vrouwen-op-de-fiets-en-te-voet)

### October 2021

ZDF – Leschs Kosmos: Gendern – Wahn oder Wissenschaft?:  
[projectvirtual.eu/2021/10/11/zdf-leschs-kosmos-gender-madness-or-science/](http://projectvirtual.eu/2021/10/11/zdf-leschs-kosmos-gender-madness-or-science/)

### May 2022

Futurezone - Wie Autos für Frauen sicherer werden können:  
[futurezone.at/science/fahrzeugsicherheit-auto-crashtest-dummy-frauen-corina-klug-tu-graz-max-lang-oeamtc/402019071](http://futurezone.at/science/fahrzeugsicherheit-auto-crashtest-dummy-frauen-corina-klug-tu-graz-max-lang-oeamtc/402019071)

### June 2022

UN Road Safety Fund Book  
"The Road Ahead, 26 voices for Safe and Sustainable Mobility" is a collection of essays concerning the vision and views of world leaders on how to ensure success of the Second Decade of Action for Road Safety in particular for low and middle income countries. SWOV Road Safety Research, contributed to a part of this book on the topic of gender equality | Chapter 4 | Analytical Synopsis by SWOV. This chapter introduction highlights the importance of the research done within the VIRTUAL project:  
[roadsafetyfund.un.org/sites/default/files/downloads/resources/2022-06/The%20Road%20Ahead.pdf](http://roadsafetyfund.un.org/sites/default/files/downloads/resources/2022-06/The%20Road%20Ahead.pdf)

Astrid Linder: A strong woman dedicated to science.... The SAT1 documentary 'Birgits Starke Frauen', aired on Monday 13 June, honours her, her outstanding passion and work.  
[www.linkedin.com/feed/update/urn:li:activity:6946108866732412928](http://www.linkedin.com/feed/update/urn:li:activity:6946108866732412928)



### September 2022

On the 10th of September 2022 ZDF aired the program 'plan b – Gleich und gerecht':  
[projectvirtual.eu/2022/09/10/equal-and-fair/](https://projectvirtual.eu/2022/09/10/equal-and-fair/)

Transport Technika Motoryzacyjna – article in the published magazine:  
[www.transporttm.pl/uploads/numery/2022/TTM\\_2\\_2022.pdf](http://www.transporttm.pl/uploads/numery/2022/TTM_2_2022.pdf)

### October 2022

BBC | The crash dummy aimed at protecting women drivers  
[projectvirtual.eu/2022/10/29/bbc-the-crash-dummy-aimed-at-protecting-women-drivers/](https://projectvirtual.eu/2022/10/29/bbc-the-crash-dummy-aimed-at-protecting-women-drivers/)

### November 2022

Dutch Design Week

Newsitem: [dezwijger.nl/magazine/designing-cities-for-all-at-dutch-design-week](https://dezwijger.nl/magazine/designing-cities-for-all-at-dutch-design-week)

Podcast: [anchor.fm/podcasts-4-brainport/episodes/DDW-2022-Designing-a-Just-Digital-Society-by-Pakhuis-de-Zwijger-e1q1khi/a-a8phg2r](https://anchor.fm/podcasts-4-brainport/episodes/DDW-2022-Designing-a-Just-Digital-Society-by-Pakhuis-de-Zwijger-e1q1khi/a-a8phg2r)

Bitch on Wheels – art exhibition

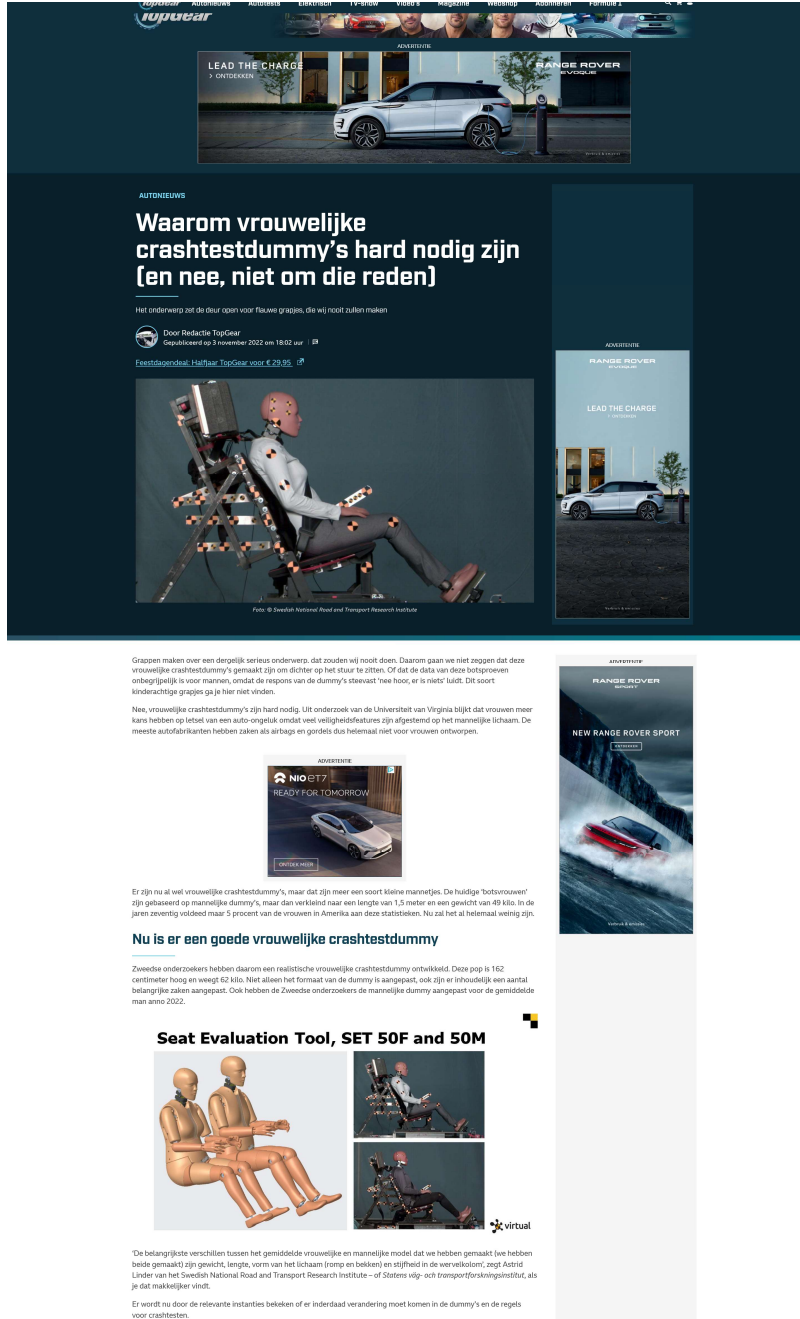
[www.wallpaper.com/art/exhibitions-shows/tora-schultz-bitch-on-wheels-o-overgaden](https://www.wallpaper.com/art/exhibitions-shows/tora-schultz-bitch-on-wheels-o-overgaden)

German program Galileo

[projectvirtual.eu/2022/11/25/galileo-crashtest-mit-eva/](https://projectvirtual.eu/2022/11/25/galileo-crashtest-mit-eva/)

BBC Top Gear

[topgear.nl/autonieuws/waarom-vrouwelijke-crashtestdummies-hard-nodig-zijn-en-nee-niet-om-die-reden/](https://topgear.nl/autonieuws/waarom-vrouwelijke-crashtestdummies-hard-nodig-zijn-en-nee-niet-om-die-reden/)



**Waarom vrouwelijke crashtestdummy's hard nodig zijn (en nee, niet om die reden)**

Het onderwerp zat de deur open voor films grasjes, die wij nooit zullen maken

Door Redactie TopGear  
Geplaatst op 3 november 2022 om 18:02 uur

Leestijd: 5 min. | 29.05.22

Grasjes maken over een dergelijk serieus onderwerp, dat zouden wij nooit doen. Daarom gaan we niet zeggen dat deze vrouwelijke crashtestdummy's gemaakt zijn om dichters op het stuur te zetten. Of dat de data van deze botsproeven onbegrijpelijk is voor mannen, omdat de respons van de dummy's stevast 'nee hoor, er is niets aan'. Dit soort kinderachtige grasjes ga je hier niet vinden.

Nee, vrouwelijke crashtestdummy's zijn hard nodig. Uit onderzoek van de Universiteit van Virginia blijkt dat vrouwen meer kans hebben op letsel van een auto-ongeluk omdat veel veiligheidsfeatures zijn afgestemd op het mannelijke lichaam. De meeste autofabrikanten hebben zaken als airbags en gordels dus helemaal niet voor vrouwen ontworpen.

**Nu is er een goede vrouwelijke crashtestdummy**

Zweedse onderzoekers hebben daarom een realistische vrouwelijke crashtestdummy ontwikkeld. Deze pop is 162 centimeter hoog en weegt 62 kilo. Niet alleen het formaat van de dummy is aangepast, ook zijn er inhoudelijk een aantal belangrijke zaken aangepast. Ook hebben de Zweedse onderzoekers de mannelijke dummy aangepast voor de gemiddelde man anno 2022.

**Seat Evaluation Tool, SET 50F and 50M**

De belangrijkste verschillen tussen het gemiddelde vrouwelijke en mannelijke model dat we hebben gemaakt (we hebben beide gemaakt zijn gewicht, lengte, vorm van het lichaam (romp en bekken) en stijfheid in de wervelkolom), zegt Astrid Linder van het Sweden National Road and Transport Research Institute – of Statens väg- och transportforskningsinstitut, als je dat makkelijker vindt.

Er wordt nu door de relevante instanties bekeken of er inderdaad verandering moet komen in de dummy's en de regels voor crashtesten.

## SET50F

In the last weeks of the project, the SET50F, developed by the VTI-team within the VIRTUAL project, caught the attention of journalists from all over the world. The BBC item was copied in most cases. Unfortunately, not all press clippings include explicit references to the VIRTUAL project.

A separate SET50F dissemination overview spontaneously was created (within WP7) to keep track of the major attention this prototype drew, and still draws. This list, containing around 60 links to press

clippings can be found below.

Some (visual) examples from this list:

News

### Researchers create world's first female crash test dummy

11th November 2022, 13:27 by Rahul Nagarej



[View Forum Discussion](#)

**The team specifically tests for low severity rear impact collisions, as in this kind of crash, women have a higher risk of whiplash than men.**

According to media reports, Swedish researchers have created the world's first female crash test dummy. This new crash dummy aims to better represent the female body and how it responds to crashes.

Reports suggest that till now, the National Highway Traffic Safety Administration (NHTSA) used a scaled-down version of a male dummy to test how women respond to crashes. This came in the form of a 4-foot 11-inch dummy weighing 108 pounds (49 kg), which is roughly the size of a 12-year-old girl and represents the smallest 5 per cent of women.

The new female crash dummy, however, measures 5 foot 3 inches and weighs about 137 pounds (62 kg). Researchers have also emphasised the dummy's chest shape and gave it a lower joint stiffness compared to its male counterpart. The dummy also comes equipped with sensors to measure the force exerted on the body during a car crash.

The team specifically tests for low severity rear impact collisions, as in this kind of crash, women have a higher risk of whiplash than men.

Astrid Linder, Director of Traffic Safety at the Swedish National Road and Transport Research Institute, stated that females are shorter and lighter on average than men and have different muscle strengths. Hence, they physically respond differently in a car crash. She added that her research could help identify the seats that have the best protection for both men and women. It can also help shape the way cars are specified in the future.

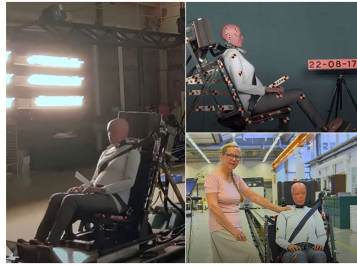
Reports state that currently there is no legal requirement for rear-impact collision tests to be carried out on anything other than a male dummy. However, some car companies are using them in their own safety tests, although they are not yet used in regulatory tests in the EU & the US.

Source: [BBC News](#)

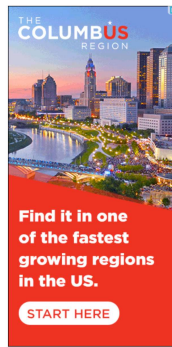
## Swedish Engineer Astrid Linder Creates World's First Female Crash Test Dummy

NOVEMBER 11, 2022


< 100 likes Facebook Twitter Pinterest LinkedIn Reddit WhatsApp



Swedish engineer Astrid Linder led a team of academics to develop the world's first female crash test dummy. The team believes this research can help shape the way cars are made in the future by highlighting key differences between men and women. Some of them include females being shorter and lighter than males, on average, with different muscle strengths.



The height and weight of this crash test dummy was designed for low severity rear impact. Aside from the geometrical differences between males and females, there are also differences in joint stiffness. Since females have less muscles and lower total strength, this corresponds to a lower stiffness between the joints. This Tesla Model 3 with Smart Summon probably doesn't have to worry about any dangerous crashes, but it should definitely not be used at airports.



**Segway Ninebot Electric GoKart Pro, Outdoor Race Pedal Go Karting Car for Kids and Adults, Adjustable Length and Height, Ride On Toys (Ninebot 5 MAX Included), Black**

SALE

- Upped The Game: The Gokart PRO comes with a top speed of 23 mph and 15.5 miles range within one single charge. Included Ninebot 5 MAX, you can easily...
- Drift like a Pro: The Gokart PRO has an RR design, the rear engine and the rear-wheel-drive are set up like supercars. Equipped with 4,900W Max engine...
- Keep Your safe: The Ninebot Gokart PRO comes with a high-strength steel frame that can carry a payload of up to 220 lbs and max slope of 15°. Triple...

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“ I think many new vehicles do provide good safety for both men and women. So the trick here is to actually assess that. So then it would require that it says in the regulation that you should use a model both of an average male and an average female. And today, the regulation tells you that you should use a model of an average male, full stop,” said Linder.



Gender Data Gap

### Dank Eva ohne Schleudertraum...

Bislang orientieren sich Crashtest-Dummys an den Maßen von Männern. Jetzt hat eine Ingenieurin eine weibliche Variante entwickelt. Wird das Leben retten?

Von **Felicitas Wilke**

22. November 2022, 11:49 Uhr / 22 Kommentare

Artikel hören

Wochenmarkt  
Familie  
ANZEIGE  
Hilfe für den Südsudan

**Z+**  
EXKLUSIV FÜR  
ABONNENTEN



Der Dummy, der bislang in Crashtests standardmäßig zum Einsatz kommt, bildet den Durchschnittsmann ab. Zum Nachteil von Frauen. © Bertrand Guay/AFP/Getty Images

Eva ist mit ihren 1,62 Metern für eine Frau weder auffallend klein noch besonders groß. Die 62 Kilogramm, die sie auf die Waage bringt, machen sie zu weder zu einer leichten noch zu einer schweren Vertreterin des weiblichen Geschlechts. Man könnte fast etwas abschätzig sagen, Eva sei eine Durchschnittsfrau. Doch das Gegenteil ist der Fall: Eva ist ein weiblicher Crashtest-Dummy – und damit ziemlich einzigartig. Die Ingenieurin Astrid Linder. Durch **Z+** Verkehrssicherheit am

#### This is the world's first female crash test dummy

Dr Astrid Linder, director of traffic safety at the Swedish National Road and Transport Research Institute leads the research in Linköping.

2 weeks ago

KMUW

#### The first female crash test dummy has only now arrived

NPR's Mary Louise Kelly talks with Swedish engineer Astrid Linder, who lead the project to create the prototype for the first crash test...

2 weeks ago

NDTV.com

#### There Is Now An Actual Crash Dummy To Protect Women ...

Although whiplash is not usually fatal, it can lead to physical disabilities - some of which can be permanent. Astrid Linder, Director of...

2 weeks ago

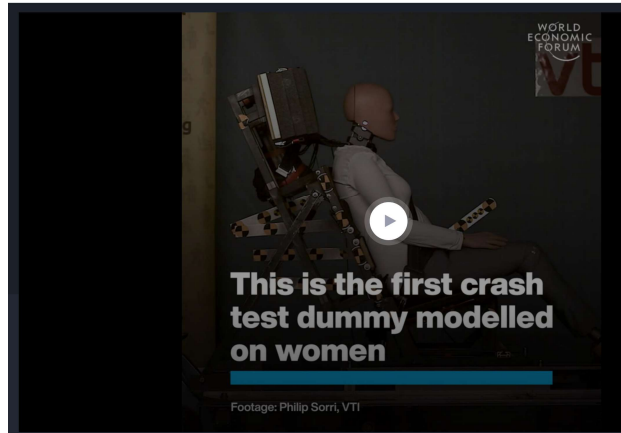
The Times

#### Women set to lose out over Britain's crash-test rules

More recently, testing has included female dummies, but only ones that ... Astrid Linder, a Swedish academic, is leading an international...

13 Mar 2022





**This is the first crash test dummy modelled on women**

Footage: Philip Sorri, VTI

**This New Crash Test Dummy Will Make Driving Safer For Women**

Posted November 10, 2022

The crash test dummy most often used as a stand-in for women is just a scaled-down version of the male dummy. At 149cm tall and weighing 48kg, it's actually the size of a 12-year-old girl. The new crash test dummy is 163cm tall and weighs 62kg, taking into account the physiology of the female body. It was created by Astrid Linder and her team in Linköping, Sweden.

TOPICS

Automotive Industry



**Des chercheurs suédois viennent de mettre au point une innovation assez intéressante pour les tests de collision... il fallait y penser !**

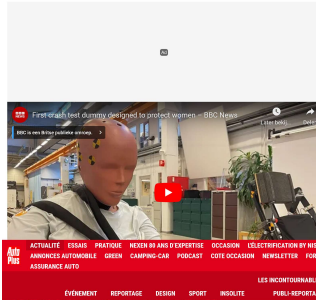
**Des chercheurs suédois** ont mis au point une innovation qui paraît somme toute assez banale. Ils ont inventé un **mannequin féminin** spécifiquement pour réaliser des **crash tests**. À priori, rien de bien révolutionnaire. À première vue, l'innovation n'a pas l'air bien incroyable : il suffit de reproduire un corps de femme à la place de celui d'un homme pour créer un nouveau mannequin.

À Découvrir Aussi



**Het meest versierde spel van het jaar. Geen installatie.**

Sauf qu'il s'agit de la **première fois de l'histoire** qu'un mannequin pour test de collision avec un corps de femme est mis au point. Mais alors pourquoi avoir pris tant de temps avant d'inventer un tel outil ? Et quelles sont les raisons qui ont amenés ces chercheurs à mettre au point, cette année, un tel mannequin ? C'est là que l'histoire devient intéressante !



First of its kind dummy designed to protect women - BBC News

ACTUALITÉ ESSAIS PRATIQUE NEWS & ANS D'EFFETIVE OCCASION VELECTRICISATION BY HISS ANNONCES AUTOMOBILE GREEN CAMPING-CAR PODCAST COTE OCCASION NEWSLETTER FORUM ASSURANCE AUTO

LES RECOMMANDABLES

ÉVÈNEMENT REPORTAGE DESIGN SPORT INSULTE PUBLI-REPORTAGE

Pendant des décennies, les tests de collision étaient réalisés avec **des mannequins fondés sur le corps d'un homme moyen**. Le problème ? Les femmes ont alors été laissées un peu pour compte dans ces tests. Les conséquences sont très problématiques, puisqu'elles sont alors **moins protégées que les hommes** lors **des accidents de voiture**.

Statistiquement, les femmes ont en effet plus de chance de mourir ou d'être blessées dans un accident de voiture. Ce problème a été mis en évidence grâce à un rapport publié en 2013 par la **National Highway Traffic Safety Administration américaine**. Celui-ci met en avant que les femmes sont globalement plus exposées aux risques de mort ou de blessures lors des accidents de la route. Et l'une des raisons pourrait justement être que les tests de collision ont toujours été réalisés sur la base de mannequins représentant des hommes moyens. La solution est alors simple. Et ce sont des chercheurs suédois qui l'ont trouvée !

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## 5 Exploitation – next steps

**We followed the Communication and Dissemination strategy and Exploitation Plan. During the course of the project, we naturally followed the needs and opportunities which we came across.**

Once our project outputs gained interest, we decided to think out of the box where we could. Sometimes that led to actions which were not foreseen. Creativity, team spirit and making optimal use of the services offered by the European Commission led to steps into the future beyond, the lifetime of the project; OVTO. To which WP7 contributed where we could.

The OpenVT Organisation (OVTO) is a politically independent non-profit association. Its ambition is to host open-source projects related to virtual testing and biomechanics on the OpenVT platform, maintaining them and ensuring the sustainable evolution in the future, whilst providing user support.

In brief, the conclusions and next steps of what has been done in the last weeks of the VIRTUAL project, after the application for Horizon Results Booster services was filed and accepted:

- We made use of the 'IPR Service Pack' to apply for advice and to get the EU trademark application VIVA+, filed at EUIPO. The filing of the International application (claiming United States, China, Canada, Switzerland, South Korea, Israel and Japan) is currently being filed. Following extensive contact with De Tullio & Partners and getting local advice and quotations, we hired De Tullio & Partners and applied for the Trademark registration through them, using the final WP7 budget for this exploitation activity. We have done our utmost to cover all legal obligations and aspects of this filing. An intensive period timewise as informative workshops are part of the service.

 <small>EUROPEAN UNION INTELLECTUAL PROPERTY OFFICE</small>	<small>Operations Department L101F (e-filing)</small>
<small>Alicante, 29/11/2022</small>	
<small>DE TULLIO &amp; PARTNERS S.R.L. Viale Liegi, 48/b I-00198 Roma Italy</small>	
<small>Receipt of an application for an European Union trade mark and notification that a provisional filing date has been accorded (Article 30(2) and Articles 32 and 41 EUTMR)</small>	
<small>Application number: Your reference: Trade mark: Trade mark type:  Applicant:</small>	<small>018801533 AADS/DFT15413 VIVA+ Figurative mark containing word elements  The OpenVT Organisation (OVTO) C/O AGU Zürich, Winkelriedstrasse 27 8006 Zürich Switzerland</small>
<small>Please be aware that the Office will only start examining trade mark applications once their fee has been paid in full.</small>	

The Office received your electronic application on 29/11/2022 and it was assigned the above application number. You should quote this number in all future contact with the Office concerning this application.

If the application meets the requirements of Article 32 EUTMR, the filing date will be 29/11/2022.



- A meeting with Maria Mancini took place in the first week of December, for Innovation Management. She suggested that we make use of HRB's business plan consulting service. OVTO's committee, will now start working on a sustainability plan. Contact with the HRB team has been made today to check on the possibilities to find the most appropriate service. Although this is outside the project's timeline, these activities started during the end of the project. This continuous team-spirit shows the commitment to this project and its results even beyond the projects lifetime. This plan will describe the routes, that we think we can generate revenue for OVTO in order to cover the expenses and keep our contents alive for the long run.
- Websites will remain active and project outcomes will be safeguarded within OVTO. SWOV/ Sanne van Gils has become a member in OVTO, contributing to uniform communication activities to remain trust in the accomplishments and give guidance/support in the following steps such as writing a sustainable plan and signalling opportunities.

## 6 Conclusion

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VIRTUAL aimed to establish a European Hub for open access Virtual Testing and to demonstrate its success through activities related to communication, dissemination, and exploitation. WP7 continuously facilitated the dialogue within the community and within the consortium to maximise the impact and increase the exploitation opportunities as the project progressed.

It has been a pleasure being the Dissemination Manager/WP7 lead of the VIRTUAL project. We have truly experienced that scientific research goes hand in hand with scientific communication and dissemination. There has been a close collaboration between WP7 and the other work packages throughout the project. Consulting WP7 in the preparation phase of workshops and presentations, led to powerful communication activities and valuable tools to build on further in the project. The researchers were nudged into seeing the bigger picture in terms of dissemination and/or exploitation opportunities.

We went off the beaten track sometimes, resulting in very positive and rewarding experiences, from our end but also that of our stakeholders/target audiences. And we have noticed other projects have learnt from our approach.

A strategic communication and dissemination plan does make the difference in approach. But that goes hand in hand with a well thought out overall approach/proposal from the start. Without confidence in the outcome/output(s) of the project, dissemination and exploitation can pose a challenge.

The impact section in new Horizon Europe calls is undoubtedly one of the most important aspects. It refers to the wider scientific/societal/technological/economical value of a project, that goes beyond its immediate results.

Judging by the continued media interest, we were able to make an impact. And our minds our spilling with ideas for the future.





When a project ends and one feels proud and sad at the same time, you know you have given it your all, as a team...



...and you are one step closer to inclusive crash safety assessment!

