



ANNUAL REPORT 2021
Connecting the
automotive sector

PREFACE

The automotive industry continues to be a very challenging environment. At the present time forms of mobility are required that are climate-proof, smart, comfortable and safe. This leads to interesting questions on technical applications, making use of the latest insights in ICT, in energy, in materials and above all: people who are able to develop and to implement such innovations.

ACE Mobility is undertaking many initiatives to make this happen. Our R&D program is focused on the content of technological issues, always in partnership with the rich possibilities that our partner community offers: research institutes, educational organizations, industries and government authorities. At the same time, we have to take into account that it is not just technical know-how that is necessary to reach for the future: the human factor is also vitally important. There is a need for more professionals who are interested in starting a career in the automotive industry.

ACE Mobility has taken the initiative to gain more insight into successful strategies to get more people engaged in our industry. And we will continue to flesh out such strategies in concrete initiatives, such as for instance the automotive learning community.

This 2021 annual report shows what we have done, and we hope you agree that, as the ACE community, we have been very active in the past year. However, being active is not enough; making impact is what really counts. In this report, you will read how we have created impact. We -the ACE Community- are creating the future of mobility.



ACE PARTNERS



Contents

Timeline	4
Talent	5
Industry	8
Research	12
Staff	15

Drive into the future

10 years of ACE Mobility



automotive center of expertise

10 YEARS

10 years of ACE

This year we have been celebrating our 10th anniversary in various ways throughout the year. We chose 'Drive into the future' as the theme for this anniversary. On the 25th of May the festivities started with an interesting interactive online program, streamed live from the headquarters of Louwman & Parqui in Raamsdonksveer. Various aspects of mobility concepts were addressed. The livestream of that day can be watched here.



DRIVE magazine

We produced the first edition of our magazine DRIVE, with some interesting stories about the future of mobility and stories from young engineers about how their careers developed.



A great aftermovie offers visitors a summary of topics of the inspiring day.



Timeline Highlights 2021



Participation Solutrans Lyon

10 February
PRO ACE

8, 15, 22 March
Workshops second-year Automotive students

25 May
Hybrid event: 10 years of ACE

6 July
Hybrid event: ACE Student Award 2021

26 July
ACE Academy Live

1 September
Meeting of the Centres of Expertise (Fontys HTSM, ACE Mobility, KennisDC Logistiek)

7,8,9 September
ACE Mobility hosts International Forum for Heavy Vehicle Transport & Technology congress

29 September
Kick-off ACE Mobility Professional Program

12 October
TALCOM Workshop: Integral Robotisation

12-14 October
Participation Ecomobiel

14 October
Start TALCOM Course: Developing Lean 4.0

1 November
Start TALCOM Workshop: Lean Six Sigma

23 November
Renewed website ACE Mobility live



13, 20 January
Workshops second-year automotive students

Ongoing
Sponsoring Student Teams (HAN and Fontys)

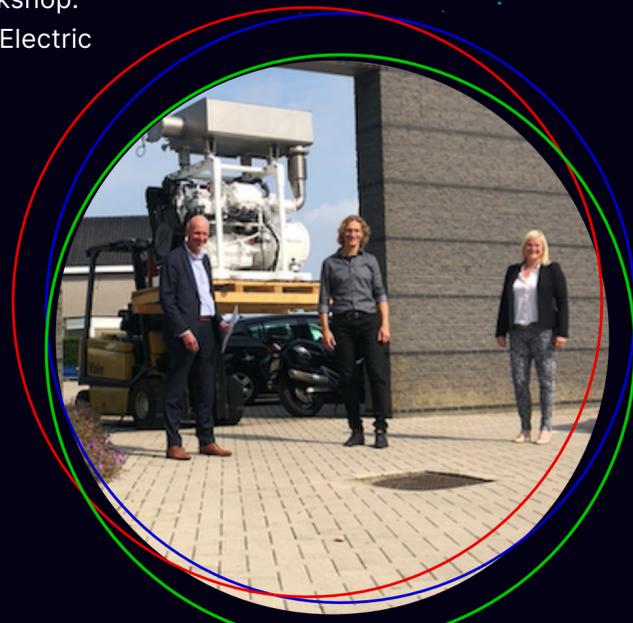
8 April
Participation Fontys Engineers Meet & Match

12, 19, 26 April
Workshops second-year automotive students

2 June
PRO ACE

30 June
TALCOM Workshop: Fire safety in Electric Vehicles

NPS Diesel becoming an ACE Partner



17 September
NPS Diesel becoming an ACE Partner

28 September
TALCOM Thematic session: Artificial Intelligence and Ethics

19 October
TALCOM Workshop: Cyber Security for Automotive

14 October
Online event: ACE Automotive Career Day

7 December
PRO ACE

16-20 November
Participation Solutrans Lyon



TALENT

TALENT

Highlights of the year

The delivery of high-quality automotive talent is a top priority for us. In order to achieve this, it remains important to continue to carry out our regular activities in which we support the Universities of Applied Sciences in generating enrolment and, above all, ensure that graduates move into industrial employment in greater numbers. The pre-master, the workshops, the ACE Job Portal, the sponsoring of student teams, the ACE Student Award and the ACE Automotive Career Day contribute to this goal. As of this year, we have also added the ACE Mobility Professional Program to the list of our regular activities.

ACE pre-master

Automotive Technology TU/e

6

students



Pre-master

mathematics course

8

students



Workshops

10

total



average of 50 students per workshop

Enrolment numbers

	2019	2020	2021
Total	366	368	391
HAN	227	231	214
Fontys	139	137	177
Fontys AM	57	59	70

Interns

33

at ACE Partners

Graduates

52

at ACE Partners

ACE Mobility Professional Program

In September, we launched a pilot of the ACE Mobility Professional Program. This Professional Program is set up in cooperation with the ACE Partners and focuses on excellent students who, during their graduation assignment with one of the ACE Partners, want to follow a number of in-depth or broadening training courses that contribute both to their professional development and to the quality of the graduation research. A selection of the training courses: Analysis Guidance in Research, Lean Six Sigma, Presentation skills, Masterclasses on particular subjects and Management Drives/DISC.

In September, five students started and meanwhile almost all training sessions have been completed. An evaluation will take place in February 2022. However, due to the great success we are already preparing a new semester for the ACE Mobility Professional Program, in which we hope to get more students to participate.



TALENT

ACE Student Award 2021

Every year, we organize the ACE Student Award. At this event the best students, who did a graduation assignment at an ACE Partner, are nominated for the ACE Student Award. During the event the students present their graduation assignment to an expert jury. We again opted for a hybrid event, as we did last year. On 6 July, Umang Tulsi, Automotive student of the HAN University of Applied Sciences, won the ACE Student Award 2021. He carried out his graduation assignment at Bosch Transmission Technology BV, where he developed a Machine Learning Model by importing test data into a model that can predict possible errors.



ACE Job Portal

Since 2020, the ACE Job Portal has been part of our basic activities. On this online platform we publish junior vacancies, internships and graduation assignments offered by our leading ACE Partners. This year, we saw a decline in the number of vacancies, internship assignments and graduation assignments. Conversations with our ACE Partners have confirmed that Covid-19 was due to this decline.

2021 was all about professionalizing the backend of the website in the area of online marketing. This will pay off in web findability and an increase in job applications. In 2022, we will monitor the results on a monthly basis and make adjustments where necessary.





INDUSTRY

INDUSTRY

The Automotive Learning Community (TALCOM)

In 2021, The Automotive Learning Community adopted a renewed progressive approach focusing on our program, community, modules and academy. This approach was thematically optimized by partner RAI Automotive Industry NL. It placed our internal thematic plans and outcomes in the context of the HTSM Automotive roadmap and suggested combined optimum routes and focus areas. As a result, our substantively growing operation has been set up around four themes: Green mobility, Smart mobility, Manufacturing & Materials and Human Capital. Each theme tackles several relevant innovative topics, organized in independent workgroups, but overseen by a thematic leader and supported by eight programmatic working groups.

This approach has led us to an extension of the project; in November Stimulus successfully granted us more time to achieve our important goals. For 2021 and 2022, we are focusing on two major goals. The first goal is knowledge transfer within the automotive sector; by setting up the ACE Academy in 2022 we are contributing to keeping the sector innovative by offering modular structured ongoing learning paths to (future) employees.

But we also link these innovations at an early stage to the education institutes in order to ensure that students and professionals are able to rapidly expand their automotive knowledge and gain a real life-long development structure. The second goal is sustainable management of the community itself. While retaining the 'learning community spirit' in the 60+ organizations currently involved, we are also reaching out for active participation of new knowledge institutes and companies. This learning community will continue its vital work long after closing the project phase at the end of 2022. We are just getting started.



ACE Automotive Career Day

The ACE Automotive Career Day is one of our annual basic activities in which we offer students the opportunity, in collaboration with the Universities of Applied Sciences, to learn about the automotive industry, while at the same time allowing automotive companies to present themselves to students, highlight opportunities in the industry, and show the possibilities for specific internships, graduation assignments and jobs. The ACE Automotive Career Day is also a place where students and the automotive industry can network.

Just like last year, we decided to fully digitize this year's ACE Automotive Career Day by means of a live stream on an online event platform. More than twenty companies gave presentations and students were able to ask all their questions via the live chat channel. Following on from last year, 'Meet The Professional' sessions were added. During these sessions, the young professionals delved deeper into the questions that were asked during the company presentations. In addition, various topics were discussed such as: What does a work day look like, which knowledge from the study is directly applicable in the field and what tips do you have for us to successfully apply for a job later on? The day ended with the online speed dates for the students who will start their internship or graduation within the next year. We look back with pride and satisfaction on a very successful day!

Online workshops for automotive students

We organized several online workshops throughout the year at our ACE Partners for second-year Automotive students at the HAN and Fontys Universities of Applied Sciences. During the workshops students work in a team on a specific topic and present their solution at the end of the workshop. In this way we want to ensure that the students find their feet in the automotive industry and learn to apply their knowledge by working on a practical topic in a team. This year, we arranged workshops with Hyster-Yale, EDAG Netherlands BV, Arval, Pon Automotive and Louwman Group.



INDUSTRY

Interview with Martine Rabe, Human Resource Director at Pon Automotive

“At Pon we offer people many opportunities to develop themselves within their field and even beyond.”



Martine Rabe is a Human Resource Director at Pon Automotive. Pon Automotive, which is part of the Pon Holding, focuses mainly on Import and dealerships, but also on a number of new mobility services such as MaaS (Mobility as a Service), connected cars, smart mobility cards and shared cars and bikes.

Martine feels Pon is a unique family business where entrepreneurship is highly valued and that has a great eye for the right people. ‘We offer people many opportunities to develop themselves within their field or even beyond. Under the umbrella of the holding company, we have many diverse companies that are inventive and self-managing. There is a lot of room for creativity and ownership.’

Pon takes good care of its people and this is reflected in the core values it pursues in its business operations. ‘People who work at Pon are tremendously result-driven and passionate about learning, but at the same time they invest a lot of time and energy in having fun together. Pon allows its employees to get on with things, and that generates mutual trust.’

Pon has been a dedicated ACE Partner since the beginning of ACE Mobility. Pon is involved in various projects within PRO ACE, but it also participates every year as a jury member for the ACE Student Award. Pon has a permanent spot at the annual ACE Automotive Career Day. ‘This year I participated for the first time in the speed dates during the Career Day. What interested me was that the students’ profiles were very diverse and while talking to the students I immediately got ideas about where particular students might fit within Pon.’

Students often only know Pon as an automotive company and are not aware that we also have many opportunities in other parts of the company, where technically they might also fit in.’ Automotive is becoming more and more digital with electrification and online sales, and this is reflected in Pon’s processes and services. That is why well-trained and innovation orientated staff is vital for the further development of the digital transition.

The partnership with ACE is an excellent tool for the inflow of these students, according to Martine. ‘In the future, I definitely plan to see if we can continue the activities with ACE at a higher level.’



INDUSTRY

Interview with Coen Rijkers, Operations Manager at NPS Diesel and Xeamos

As Operations Manager at NPS Diesel and Xeamos, Coen Rijkers knows all aspects of the company. He heads up the Engineering department, Supply Chain [Purchasing Warehouse Logistics and Production], Project Management, Commissioning & Service and Quality ISO9001.

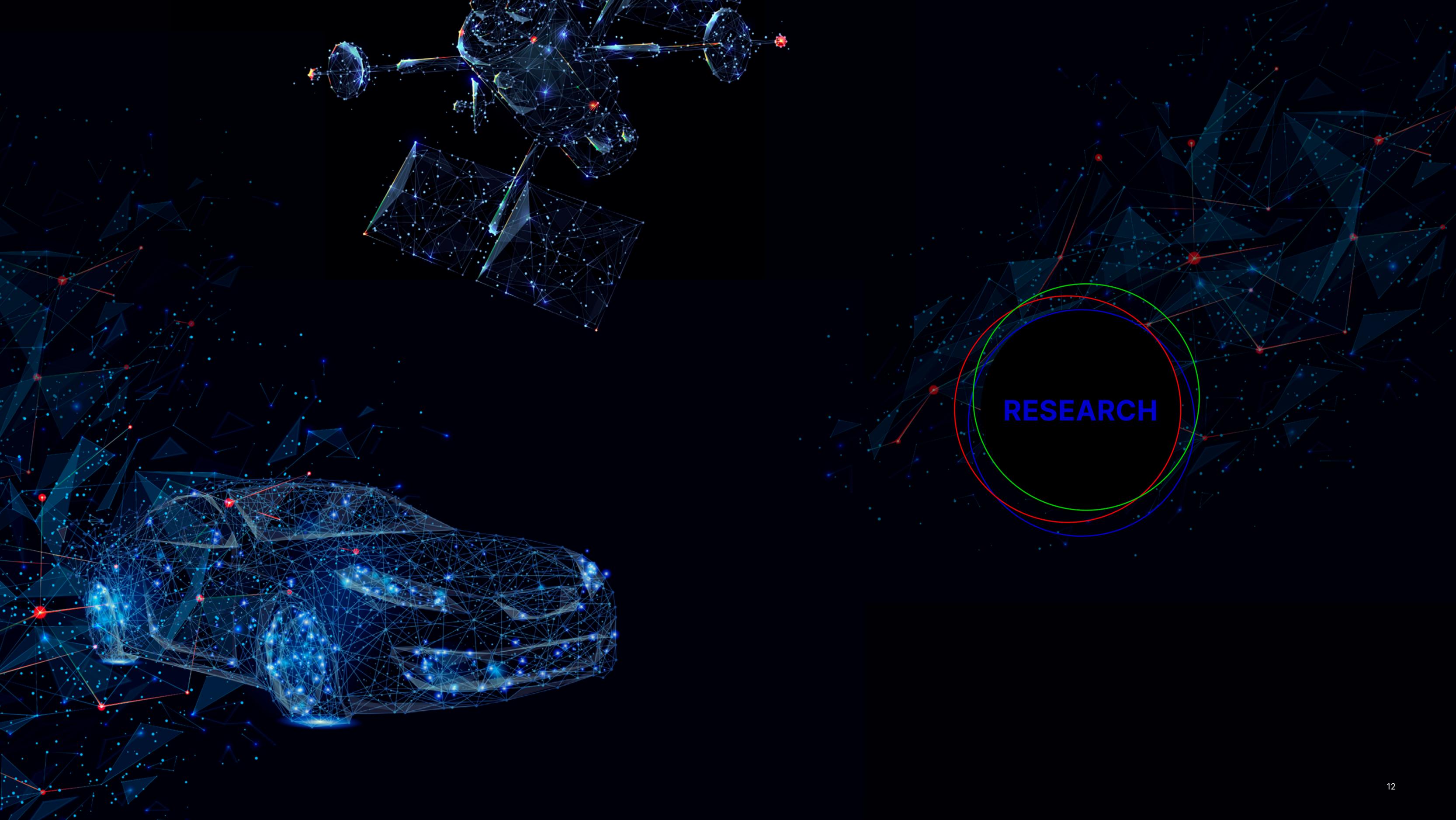
NPS Diesel deals with all aspects of powertrains. It designs, produces and commission generators based on engines with a casing that reduces vibration and noise. In addition, exhaust gases are cleaned through Xeamos After Treatment systems, which is of great importance especially in super yachts and increasingly in commercial shipping. The company is also working hard on innovation of combustion engines and alternative propulsion techniques.

“Internships and graduation assignments give us access to our future employees!”

Coen: ‘NPS Diesel will develop strongly in new directions in the next few years. Providing innovative powertrain solutions is the challenge for our company. This also requires us to invest in mechatronics and “remote monitoring” expertise. These developments will affect all our business processes.’ Coen also foresees that with the rise of digitalization, services can increasingly be provided remotely, with systems engineering and ICT leading the way.

In 2021, NPS Diesel became a member of ACE Mobility. Coen: ‘Considering all the developments that await us, the connection with the Universities of Applied Sciences is vital. Internships and graduation assignments give us access to our future employees. We want to offer the “gems” among the students a job!’ Coen adds that NPS Diesel would like to be involved in the research opportunities that ACE Mobility is developing, for example in hydrogen for propulsion. NPS Diesel is also attracted to collaboration with partners in the Netherlands: the company has its own academy, and connections to the growing automotive learning community are a positive development.





RESEARCH

RESEARCH

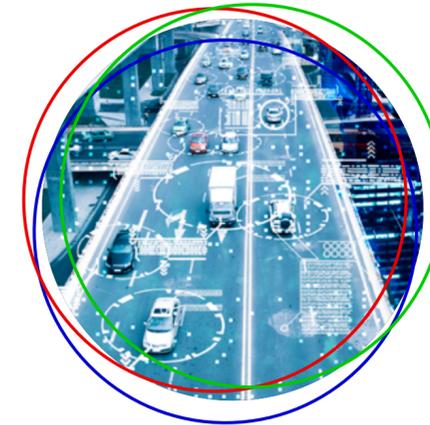
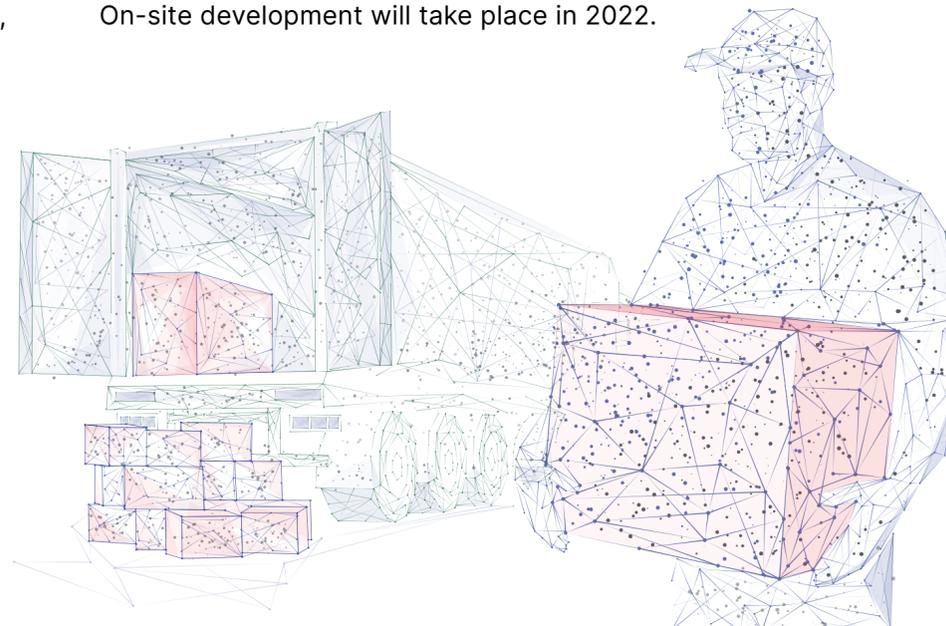
IMIAT

By using Connected & Automated Transport (CAT) freight delivery can be faster, cheaper and more sustainable. In 2020, we started the IMIAT project (Innovation and Mobility Implementation in Automated Transport) with transport companies, technology industries, governments and knowledge institutes. The ambition of the project is for 20% of the freight of the participators to be delivered through automated transport in the chosen corridors by 2030. In 2021, we developed the project further with the Living Lab, Closed Track Test and Virtual Test Track working groups. Industry partners participated in all groups and together they defined their goals and work packages. In 2021, several initiatives took place to promote the project. Also, possibilities for funding were investigated. In 2022, the project will continue with some use cases and international connections will be explored



H2 Mobility Lab

The project 'setting up a business-oriented testing laboratory' is aimed at the joint preparation and set-up of a professional experimental and testing laboratory that is a seamless fit with the energy and mobility-related activities of the open innovation lab Connectr at industrial business park IPKW in Arnhem, the Netherlands. The testing laboratory will be the realization of an independent experimentation and test center for hydrogen Fuel Cell propulsion technology and related hydrogen storage and refuelling technology. Innovative (SME) companies will be able to use this as a shared facility for application-oriented experiments and full-scale tests of components, systems and vehicles. In other words, practical tests that are necessary for the large-scale, safe and reliable implementation of the combination of green hydrogen and clean (Zero Emission) FCEV technology in heavy, long-distance or 24/7 road transport & mobility. In 2021, further investigations were carried out on how and with whom these experiments and tests can be realized in a testing laboratory. On-site development will take place in 2022.



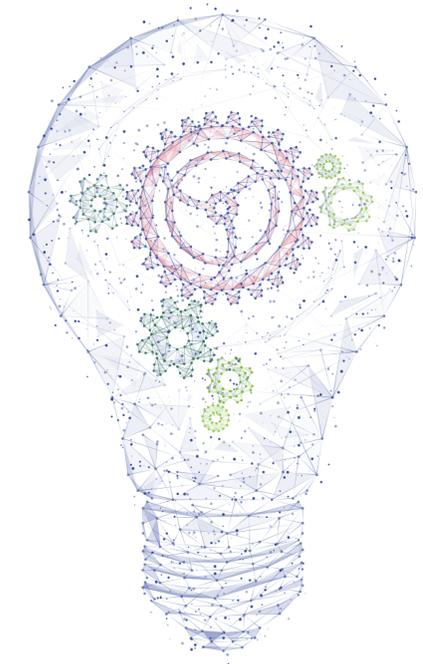
Monitoring

In Q1 of 2021, we finished the first phase of an extended monitoring project of all 50 RET (the Rotterdam Public Transport organization) electric city buses. The result of this phase was that the Fontys students did a well-executed data-driven quantitative baseline measurement and technical analyses as the basis for long-term monitoring research of these buses (focusing on e.g. battery health and uptime). The Rotterdam students translated these results into conclusions including qualitative operational management advice on how to optimise monitoring, with a view to continuous improvement.

In the coming year, new applications for the monitoring tools will be investigated.

Joint research on lightweight materials and 3D printing

Using lightweight and recyclable materials is an extremely important topic in designing cleaner and more energy-efficient vehicles. That is why we stimulated a joint 'Lightweight 3D' research proposal of HAN and Fontys. This project should combine the HAN's expertise on Fibre Reinforced Thermoplastic Composites for structural parts and Fontys' expertise on 3D Metal Printing for reinforcement inserts, but should also involve automotive companies. Fontys students have recently produced and tested a second generation of 3D designs (to be inserted into composites) in several shapes.



PARTNERS



STAFF

HAN UNIVERSITY
OF APPLIED SCIENCES

Fontys

rai
vereniging

rai
AUTOMOTIVE
INDUSTRY NL

NOOTEBOOM
SPECIAL TRAILERS SINCE 1981

inalfa
roof systems

Sensata
Technologies

BISTYLE

RDW

VDE

ARVAL
BNP PARIBAS GROUP

POLITIE
ACADEMIE

VB
airsuspension

BOSCH

LOUWMAN
GROUP

punch
powertrain
Gear up for the future

VIRO EDAG

OSnoeks
AUTOMOTIVE

Capgemini
engineering

MITSUBISHI
AUTOMOTIVE
INDUSTRY GROUP

DAF
A PACCAR COMPANY

NPS Diesel
Engine Applications

HYSTER-YALE
GROUP

STAFF

The ACE Team



Kees Slingerland
Director



Leo Peeters
R&D Manager
(until July 2021)



Gentiana Tijssen
Communications Officer



Joop Verhagen
Project Manager



Saskia Lavoo
Program Manager



Stefan Kraaijvanger
Project Management
Officer



Thomas van Berkel
Project Manager



Ingrid van Lierop
Office Manager



Frank Rieck
Head R&D



Corine Legdeur
Communications Advisor,
Project Development



Jeroen van der Werf
Project Manager



Jan van Wijk
Project Manager

ACE Board

Henk Bos	Chair
Ella Hueting	Fontys University of Applied Sciences
Albi van Buel	RAI Automotive Industry NL
Gerrit Aversch	HAN University of Applied Sciences

ACE Supervisory Board

Rob Verhofstad	HAN University of Applied Sciences, chair
Hans Corstjens	
Elphi Nelissen	Fontys University of Applied Sciences
Henri Koolen	VDL
Marinka Nooteboom	Koninklijke Nooteboom Group

Graduations and interns at ACE Mobility

Sterre Gockel	Student at Rotterdam University of Applied Sciences, Research Report: Method of monitoring the ProMo Project compared to 2020
Roen Pulles	student at HAN University of Applied Sciences, Advisory Report: The recommendation for ACE Mobility to attract 10% more students to the automotive sector
Niels Winter	Student at Fontys University of Applied Sciences, Research Report: The establishment consensus for autonomous road transport in 2030
Jasper van Berkel	Student at Fontys University of Applied Sciences, Advisory Report: Strategic and tactical marketing plan for TALCOM
Lucas van der Cammen	Student at Fontys University of Applied Sciences, Research Report ProMo: How can the Automotive Center of Expertise offer the monitoring service to other parties?
Rob Philipsen	Student at Fontys University of Applied Sciences, Research Report: Transition from traditional to electric vehicles related to the TALCOM project

OUTLOOK

Noblesse oblige. At the same time, pride in what we have achieved in 2021 creates an obligation for the years ahead. Because the developments in the automotive industry never stop and the challenges will become even greater. With prestigious initiatives like the IMIAT program on autonomous freight transport and the hydrogen lab in Connectr, ACE is exploring some highly promising paths. 2022 must be the year in which these initiatives materialize into real projects and programs, as always in close cooperation with our partners.

We will attempt to connect dedicated partners in fields where we think we can strengthen the future of mobility needs. And we will focus even more on the possibilities to attract more (young) professionals to the automotive industry. We realize that such ambitions can only be achieved by bringing in international partners. We have a growing international network and we aim to extend it in the years to come.

With a dedicated team and a group of highly motivated partners who take the lead in the automotive industry, ACE Mobility remains at the forefront of the future of the automotive industry. Not as a goal in itself, but as a requirement for a prosperous future society with smart, green, comfortable and safe mobility. Because: Together we create the future of mobility.



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