



# CoEXist

## D5.5

# Exploitation and Innovation Plan

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## 1 Introduction

### 1.1 Task

As defined in Grant Agreement 723201 between INEA and the CoEXist project partners RUPPRECHT, PTV, VTI, RENAULT, Vedecom, TASS, POLIS, FEHRL, IDforCAR, USTUTT, UNIFI, Gothenburg, Milton Keynes, Helmond, Stuttgart, as of 05/04/2017,

*“CoEXist partners will develop an Exploitation Plan (D5.5) that describes the actions to follow for the sustainability and exploitation project results. It will identify exploitable results and also describe dissemination channels implemented during the course of the project to support the exploitation of results.”*

As lead beneficiary for this deliverable, RUPPRECHT is responsible for the compilation of this deliverable's report.

### 1.2 Objective

The purpose of the Exploitation and Innovation Plan is to provide recommendations on how project partners can ensure that new knowledge, elements, and innovation generated from the project is well managed and strategically exploited, while concurrently safeguarding intellectual property rights (IPR) as stated in the consortium agreement. The Exploitation Plan complements and enhances the impacts of the Automation-ready Action Plans (D4.6) of the city project partners by establishing innovation management strategies. Furthermore, D4.6 ensures that the innovation potentials within CoEXist are achieved and exploited. This would subsequently ensure to have a significant and larger impact in the European context which would support the successful transition to autonomous transport and in particular the coexistence with conventional vehicles within a wider city environment.

Complementary to the Exploitation and Innovation Plan for the consortium as a whole, the plan also contains for each partner an individual plan which describes their innovation and exploitation intentions and strategies in their respective organisation/company or field of work.

### 1.3 Development Process

As part of the development process of the Exploitation and Innovation Plan, external stakeholder input has also been collected to make project results fit to customer needs. Thus, being able to manage exploitation and innovation by monitoring and integrating market requirements, product and process innovations, and scientific/technical publications from their respective research areas or industry sectors. Among others, the Exploitation and Innovation Plan encourages and suggests academic exploitation through actions such as new (or renewed) teaching modules or curriculums, and elicitation of new funding opportunities to take forward new research challenges in autonomous transport that emerge during the course of the project. Beyond strengthening the market position of the project partners in their core business, the CoEXist results could bring yet unforeseen business cases and business opportunities.



## 1.4 Relevant Deliverables

The CoEXist project will, inter alia, exploit the following deliverables:

- A trans-disciplinary Automation-ready framework (D1.2) and guideline which will facilitate the step-wise introduction of automated driving systems;
- Innovative modelling tools for AVs (D2.4; D2.7);
- Findings from the application of the developed hybrid infrastructure impact assessment tool (D3.3), e.g. for drafting recommendations for Automation-ready hybrid design and engineering of road infrastructure (D3.4);
- Results of the impact assessment tool concerning safety performance of AVs and its interaction with the environment;
- Compilation of good practice take-up strategies based on implementation results which are part of the comprehensive Automation-ready Action Plan (D4.6) and Guidelines on how become an Automation-ready road authority (D4.7).

These exploitation of the outputs from the CoEXist project will particularly be vital, beneficial, and of great significance for transport and regional planning authorities, and will influence national and European-level policies on automated transport and its interfaces with the urban environment.

## 1.5 Systematic Approach

In order to maximise its impact, CoEXist follows a practice-oriented, systematic approach to exploitation and the project has defined work packages focusing different target groups at different phases of the project: on early involvement of stakeholders (WP1) to define requirements and Automation-readiness (incl. international cooperation), on road authorities and transport planners as the main end user of CoEXist's products and results (WP4) as well as on broader engagement with target groups, e.g. infrastructure managers and AV-related companies; support by communication and dissemination activities (WP5).

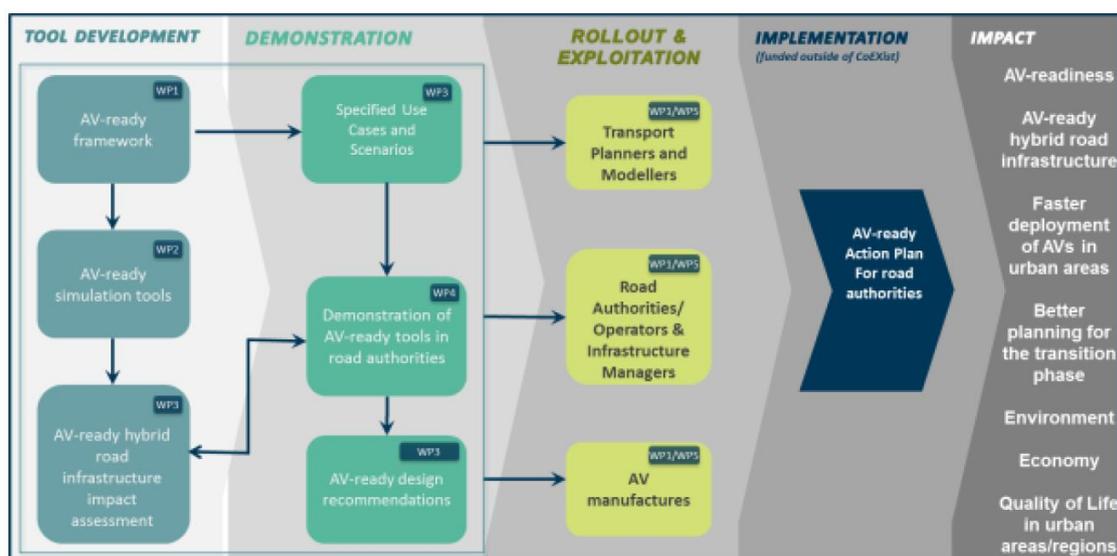


Figure 1: Systematic Approach

## 2 Exploitation & Innovation of Project Results

### 2.1 Products, Tools & Guidelines

CoEXist has developed Automation-ready modelling and Automation-ready hybrid infrastructure impact assessment tools as well as guidance documents for road/city authorities to become Automation-ready. The exploitation of these results varies from commercialized (software / modelling tools in terms of legitimate commercial interests) to open access (impact assessment tool, guidelines) or might be established by licensing deals, assignments or new partnerships etc. One of the main key results of CoEXist are the “default values” for Automation-ready transport modelling which have been made accessible to transport planners to support Automation-ready modelling beyond CoEXist’s tools. The exploitation of these results is developed and described in the CoEXist Exploitation Plan.

### 2.2 Research

The university/educational partners UNIFI and USTUTT will integrate CoEXist findings in the transport planning and transport infrastructure planning courses for civil engineering / transport planning students, which will be called to designing road infrastructure in the near future, thus accelerating the conversion of the CoEXist findings into practice.

### 2.3 Automation-ready Framework

The CoEXist brand “Automation-ready” will be exploited through an application- and practical-oriented approach in terms of implementation of tools and further stakeholder involvement. The CoEXist road authority partners will be “early adopters” of automation-ready transport modelling and impact assessment, and it needs further road authorities to test, validate and develop further CoEXist’s Automation-ready framework, tools and design recommendations. In particular the involved networks FEHRL, iD4Car and Polis will set the scene for broader stakeholder involvement and raising awareness for CoEXist results (e.g. in relevant working groups - existing ones as well as newly established ones - , as automation-ready transport planning is largely ignored, even though AVs represent one of the biggest challenges and changes in future and road authorities. They need to understand and incorporate these into their future visions, as early adoption and preparation (in the sense of Automation-readiness) will bring substantial “gains” to those who are prepared. For this, CoEXist partners will continue the work on the definition of Automation-readiness beyond the project and foster an informed public debate about AV and how cities should look in the future.



## 3 Exploitation & Innovation at Partner-level

After the final consortium call on April 16, 2020, every project partner was asked to indicate their individual plans to exploit CoEXist outputs considering policy development, product innovation & commercialisation, and / or academic & teaching.

### 3.1 Consulting Partners

As sole consulting partner in CoEXist's project consortium, Rupprecht Consult has been responsible of several dissemination efforts and plans to integrate CoEXist deliverables in several areas. Exemplarily the automation-ready framework, as one of the key outputs of CoEXist, is used in INTERREG projects such as PAVe and Dynaxibility4CE to prepare further cities towards automation-readiness. Additionally, the framework provides significant value for SUMP-related consulting of cities that seek guidance in preparing for increased automation. In the development of new SUMP practitioner briefings and topic guides, the automation-ready framework will also play a central role for the further development of a more comprehensive topic guide for CCAM planning. The automation-ready framework and guidelines for authorities will also be used to adapt the recently updated SUMP self-assessment tool towards CCAM planning, i.e. a quick online assessment functionality regarding automation-readiness. Finally, Rupprecht Consult is involved in several working groups and initiatives, e.g. Civitas thematic groups for integrated planning or game changers and the UITP SPACE project, in which all the results from CoEXist will be incorporated.

### 3.2 Technical / Research Partners

The cluster of technical and research partners is compiled of PTV, VTI, Vedecom, and TASS.

PTV Vissim and PTV Visum have been essential for microscopic and macroscopic modelling and simulation throughout the project. Deliverables D2.9, D2.10 and D2.11 describe features of the software that was developed in the context of the CoEXist project. These features, including manuals on how to use them, have since been included in PTV's product portfolio and will be subject to further development outside the realms of CoEXist. In terms of dissemination, several webinars on the new functionalities of the software have taken place and recordings are available online.

Furthermore, among the other research partners, CoEXist outputs such as the use cases carried out in Gothenburg, Milton Keynes, Helmond and Stuttgart deliver best practice examples on the deployment of new modelling and simulation tools. These can be used in future pilot projects and the core control logic could constitute a basis for the development of further developed software of any simulator provider.

### 3.3 Stakeholder Networks

The cluster of stakeholder networks comprises of POLIS, a network of European cities, the OEM network IDforCAR, and FEHRL, a network of national road authorities.

On the policy side, CoEXist outputs will gain traction in several working groups on CCAM at the European Commission and be positioned in Horizon Europe's strategic research and innovation agenda (SRIA) as



well as in ERTRAC's urban mobility working group. Apart from that, the network partners will disseminate, promote and further develop CoEXist findings towards European city and regional authorities.

In terms of further research, especially among OEMs and public transport operators, CoEXist project outputs will be integrated into technology R&D processes and into the development and commercialization of new services. Several project outputs will be further exploited in the experimental design of new pilot and testing projects. Lastly, all project findings will be made available to a network of research centres and thereby could become subject to further research.

### 3.4 Academic Partners

The two academic partners are University of Stuttgart (USTUTT) and University of Florence (UNIFI).

In the context of academic research, CoEXist outputs will clearly provide the scientific foundation for new recommendations on vehicle automation, as the tools for transport planners and modelers will be part of further research and academic curricula. Additionally, through the universities' networks, project results will reach national public entities, exemplarily through the Board of Academic Advisers to the Federal Minister of Transport and Digital Infrastructure of Germany, and decision-makers in the automotive sector in formats like the strategic dialogue for the automotive sector in Baden-Württemberg.

### 3.5 Cities & Road Authorities

The project's partner cities are Gothenburg (SE), Milton Keynes (GB), Helmond (NL), and Stuttgart (DE).

CoEXist outcomes, notably the automation-ready framework, have profound impacts on the cities' mobility strategies. As direct contributors to the project, the cities have disseminated CoEXist throughout their local ecosystems of regional and municipal authorities, public transport operators, private sector entities such as vehicle OEMs, academia and also its citizens, from the beginning of the project. This active publication and creation of awareness positioned CCAM at the top of strategic agendas of several groups of actors. Furthermore, as shown by the ParkAV project (a collaboration between Appyway, Jaguar Land Rover, Milton Keynes Council and Coventry City Council), modelling approaches developed in CoEXist use cases can be taken as a basis for similar use cases. Other CoEXist use cases have shown the possibility of capturing quick wins in the field of C-ITS, as shown in Helmond. Furthermore, the importance of setting up effective working structures and collaboration models has been recognized by the participating cities and will be considered in the future.

## 4 Conclusion

As summarized above, the project has already spurred exploitation and innovation in numerous instances, chiefly in the areas of policy development, product innovation & commercialisation, and academic & teaching.

In light of the automation-ready framework (D1.2), an essential way of exploiting CoEXist project results is their dissemination with the aim of creating “automation awareness”. As the partners’ exploitation measures reflect the aim of putting liveability at the focus of policy development and strategic goal setting, there has been a paradigm shift in policy development towards people friendliness and making CAVs city-ready, instead of simply making cities Automation-ready with the risk of losing focus on human-centred urban design. Extensive collaboration with important stakeholders such as local citizens, exemplarily through automation-ready fora (D4.4), showcase the implementation of this shift.

Concrete “planning for automation readiness” can be found in the exploitation plans of various project partners that have started to reassess mobility strategies by considering options to integrate CCAM into collective mobility systems. Such considerations also incorporate updated travel demand models and touch on new infrastructural requirements, especially for C-ITS. In the field of connected mobility, upscaling processes have already begun in some cities, as quick wins can be captured in this domain.

Finally, the need to set up organisational structures, as specified in the last phase of automation readiness, is also displayed in the exploitation and innovation plans of participant cities. Especially smaller cities plan to react to the fact that they rely on a collaborative approach to access know-how and experience. Other cities with a number of public (road, transport or traffic) authorities have recognized the need to effectively organize efforts internally as well.

Apart from the cities, also stakeholder networks, technical / research partners and academic partners will utilize CoEXist outputs on a policy level by positioning them in other projects and consortia. Through these channels, authorities on national and European level are encouraged to continue supporting joint efforts in preparing for automation, which enables further collaborative projects helping cities, researchers and policy-makers to co-develop clearer implementation scenarios of CCAM.

Through networks including vehicle OEMs as well as private individual and collective mobility providers, it is likely that product and service innovation will similarly follow a participatory approach by including key stakeholders. Lastly, research institutes and universities are heavily involved in developing new means of fact-finding (impact assessment, microscopic and macroscopic modelling, defining performance metrics), which is essential develop clear strategic visions for the coexistence of conventional and automated vehicles in a broader urban mobility setting.

## 5 Appendix: Partners' Individual Inputs for Exploitation and Innovation Plan

### 5.1 Consulting Partners

#### 5.1.1 RUPPRECHT

As sole consulting partner in CoEXist's project consortium, Rupperecht Consult has been responsible of several dissemination efforts and plans to integrate CoEXist deliverables in several areas. Exemplarily the automation-ready framework, as one of the key outputs of CoEXist, is used in INTERREG projects such as PAVE and Dynaxibility4CE to prepare further cities towards automation-readiness. Additionally, the framework provides significant value for SUMP-related consulting of cities that seek guidance in preparing for increased automation. In the development of new SUMP practitioner briefings and topic guides, the automation-ready framework will also play a central role for the further development of a more comprehensive topic guide for CCAM planning. The automation-ready framework and guidelines for authorities will also be used to adapt the recently updated SUMP self-assessment tool towards CCAM planning, i.e. a quick online assessment functionality regarding automation-readiness. Finally, Rupperecht Consult is involved in several working groups and initiatives, e.g. Civitas thematic groups for integrated planning or game changers and the UITP SPACE project, in which all the results from CoEXist will be incorporated.

### 5.2 Technical / Research Partners

#### 5.2.1 PTV

Each of the features described in D2.10 "Vissim extension new features and improvement - final" is available for any user of PTV Vissim and in the same way each feature described in D2.9 "Built-in Automation-ready macroscopic tool" is available for any PTV Visum user. For both software, a manual on how to use the feature is available: "D2.11 Guide for the simulation of AVs with microscopic modelling tool" (PTV Vissim) and D2.9 (PTV Visum) which can be found in the manual document that is provided when installing the software but also online in the online help. Several webinars\* are also online on the CoEXist YouTube Channel and on PTV YouTube channel to provide practical information and examples. The features developed within CoEXist have been added in the training program PTV is providing to its customers. It ensures that the software developments that were part of the CoEXist project will be used after the project. Furthermore, further developments will be considered based on customers' requests and market analysis.

By a simple search on Google Scholar with the 2 words "CoEXist" and "Vissim" ([https://scholar.google.de/scholar?start=10&q=Vissim%2BCoEXist&hl=de&as\\_sdt=0,5](https://scholar.google.de/scholar?start=10&q=Vissim%2BCoEXist&hl=de&as_sdt=0,5)), one can get a glance at the use of the CoEXist project for research purposes and can expect to see even more articles in the near future (86 hits since 2018) showing that the exploitation of the project by external people has started already.



\*List of the Webinars:

- CoEXist Vissim Webinar - Autonomous vehicles new features and how to?  
[https://www.youtube.com/watch?v=C\\_bouqPNSw4&feature=youtu.be](https://www.youtube.com/watch?v=C_bouqPNSw4&feature=youtu.be) (05.10.2018)
- What's new in PTV Vissim 11 [https://www.youtube.com/watch?v=yz04\\_sC9cLo](https://www.youtube.com/watch?v=yz04_sC9cLo) (14.11.2018)
- CoEXist Automation-ready transport modelling tools  
[https://www.youtube.com/watch?v=Gbht\\_gZZHM8](https://www.youtube.com/watch?v=Gbht_gZZHM8) (19.11.2018)
- PTV Talks: CoEXist, Preparing the Transition to Automated Vehicles with PTV Vissim  
<https://ptvtraffic.us/resources/ptvtalks-coexist/> (12.04.2019)
- Modelling of Autonomous Vehicles (AVs) in PTV Visum  
<https://www.youtube.com/watch?v=PHDeRbvpfkw> (CoEXist)  
<https://www.youtube.com/watch?v=Sum-AHhz4pw> (PTV) (25.09.2019)
- PTV Talks: Modelling Autonomous Vehicles in PTV Visum 2020  
<https://ptvtraffic.us/resources/ptv-talks-modeling-autonomous-vehicles-in-ptv-visum-2020/>  
(14.11.2019)
- Automation-ready transport modelling tools [https://www.youtube.com/watch?v=Gbht\\_gZZHM8](https://www.youtube.com/watch?v=Gbht_gZZHM8)  
(20.11.2019)
- What's new in PTV Visum 2020  
<https://ptvtraffic.us/resources/webinar-whats-new-in-ptv-visum-2020/> (23.12.2019)
- PTV Talks: CoEXist: Modelling autonomous vehicle mit PTV Vissim  
<https://ptvtraffic.us/resources/coexist-2/> (12.03.2020)
- CoEXist Automation ready Modelling Training  
<https://www.youtube.com/watch?v=HL-NPQNsJV8> (03.04.2020)

## 5.2.2 VTI

The results from the CoEXist project will be used as input in the ongoing national project SMART (Simulation and Modelling of Automated Road Transport), which will further investigate how to model automated vehicles in microscopic traffic simulation models and assess impacts on traffic performance. VTI and UNIFI also plan for master thesis student exchange for further investigations of traffic performance effects utilizing the CoEXist developed tools. Through VTIs close collaboration with Linköping University, they will also exploit knowledge on traffic simulation of automated vehicles with courses on traffic theory and simulation.

## 5.2.3 Vedecom

VEDECOM is covering several large-scale deployment projects and FOTs, involving both private vehicles and automated shuttles, SAE L3 or 4, and various use cases. The institute is coordinating the implementation, evaluation and impact assessment methodologies for the French SAM project, and the demonstrations in the 2 French demo sites of the EU SHOW project.

Those projects aim at proposing recommendations in terms of integration of the automated services in the city environment (physical infrastructure and transport offers), as well as governance and urban planning,



and defining the future public/private ecosystems for automated mobility development. In this context, CoEXist gives VEDECOM an accurate framework for a global approach of local authorities in existing and future projects, as well as additional tools to address the upscaling issues through simulations.

For instance, the outcomes of CoEXist, and particularly the guidelines for developing and implementing the urban mobility plan will be exploited, as well as the results of simulations in comparable use cases (Goteborg and Milton Keynes particularly).

CoEXist has also given VEDECOM the opportunity to link the research activities in service and technology development, and the activities of the IVM<sup>1</sup> in the field of societal approach of urban mobility.

On the other hand, the contribution of VEDECOM in the WP2 of CoEXist, offers VEDECOM the wide panel of possibilities to propose to simulator providers the core control logic of VEDECOM as a plugin bundle installable in order to evaluate the effect of automation on several aspects, economical, societal and environmental. The Core control logic can be optimised and improved to deal with several kind of researches, this offers to VEDECOM the possibility to propose it in different research projects dealing with transportation systems, automation etc.

## 5.2.4 TASS

For the tested and calibrated control logic AV-simulator connection software, a major CoEXist output developed in D2.1, TASS' software PreScan has been an integral component next to PTV Vissim. TASS will also further develop their product based on experiences and findings from the abovementioned development process. Especially the integration of driving logics for AVs could be of relevance here.

## 5.3 Networks of Specific Stakeholders

### 5.3.1 POLIS (network for cities)

Polis plays an active role in the automated vehicle research, innovation and policy development environment at European level. It plans to capitalise on the CoEXist findings and general approach as follows:

- Polis is a member of the EC's CCAM platform which is a platform of experts whose role is to assist the European Commission in building a framework for CCAM research, innovation and pre-deployment. Polis will ensure the CoEXist outputs are fed into the work of various CCAM platform WGs that it is part of, including Research and Innovation coordination, Infrastructure and Road safety.
- Polis is part of the drafting committee of the CCAM partnership to be submitted under Horizon Europe and is involved in building a strategic research and innovation agenda as part of this partnership. Polis will ensure that the CoEXist findings are reflected and built upon in the partnership and in particular the SRIA.

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<sup>1</sup> Institut pour la Ville en Mouvement – City on the Move Institute, VEDECOM entity dedicated to research on the societal and urban aspects of mobility

- Polis is heavily involved in ERTRAC, the European Road Transport Research Advisory Council, including as co-chair of the urban mobility working group.

Polis will also continue to promote the CoEXist findings and tools among Polis members (city and regional authorities) and more broadly, in particular through the Polis working group that is addressing automated vehicle issues, the Polis Traffic Efficiency Working Group.

### 5.3.2 FEHRL (network for national road authorities)

FEHRL's members include national road administrations across Europe and the world. In its function as a research forum, it can not only disseminate findings and encourage further research through its Future Research Agenda, but also give strategic policy recommendations to its members. FEHRL as a consulting network for road authorities is specialized on governance for implementation, multimodal integration and digitalisation in the context of automated vehicle infrastructure. Therefore, FEHRL is expected to make meaningful contributions in the ongoing exploitation and innovation of CoEXist outputs.

### 5.3.3 IDforCAR (network for OEMS)

ID4CAR will exploit the CoEXist results in

- Product innovation: the results will be presented in a session in June 2020 in Rennes to our members, for making new projects emerging from the work done: as new questions raise from the COVID crisis on the place and role in cities of AVs, the cities and operators support us in our Post COVID innovation campaign and will build on CoEXist findings to develop new technologies, use cases and services. The outcome will be innovative projects supported by cities and operators to be developed and financed end 2020. This will lead to commercialization of new products and services in 2021-2022.
- Innovation: ID4CAR is partners in the SHOW H2020 project and is the coordinator of a large test site for AVs shuttles in Rennes in the new hospital CHU. CoEXist outcomes will be extensively exploited in designing the experimentations and the new infrastructures' equipment and digital services.
- Policy recommendations: ID4CAR will have face-to-face sessions with its partner cities in West France for presenting the policy outcomes of CoEXist and support their take up in these cities' plans and AVs strategies (Rennes, Nantes, Bordeaux, La Rochelle, Poitiers, Niort, Brest, Saint Nazaire, etc.)
- OEM strategies: ID4CAR will pursue OEM awareness by presentations of CoEXist results in its sessions with OEMs end 2020 and beyond, as the evolution of the importance of AVs in OEM strategies is refocused after COVID.
- Academic: ID4CAR gathers 10 universities' research centers focused on AVs (technology and SHS) and will make CoEXist results available for use in training by these centers for students and young professional, and as a basis for new research projects to be developed and submitted for financing by the National research Agency in France in 2021.



## 5.4 Academic Partners

### 5.4.1 USTUTT

#### Policy development

- USTUTT provides background information and recommendations for decision makers in politics, in road authorities and in transit authorities. CoEXist results provide the scientific foundation for recommendations on vehicle automation.
- Prof. Friedrich is member of various boards (e.g. Board of Academic Advisers to the Federal Minister of Transport and Digital Infrastructure, Strategic dialogue for the automotive sector in Baden-Württemberg), where he disseminates CoEXist outcomes.

#### Product innovation & commercialization

- USTUTT provides tools developed within the project for transport planners and modelers (e.g. webinar material to download at the website of the chair).
- USTUTT will use the developed tools and the accumulated knowledge for future research projects.
- The experiences made through participating in the project CoEXist increases our ability to meet the requirements of future projects on the national and international level.

#### Academic and teaching

- USTUTT includes the results in teaching ranging from general information on vehicle automation to specific modelling lectures.
- Students test and apply the developed tools and software functionality in their master theses.

### 5.4.2 UNIFI

Similarly to the University of Stuttgart, the University of Florence will disseminate CoEXist findings across several research faculties for further research and add modelling lectures specific to automated vehicles to the curricula. Furthermore, UNIFI has entered a partnership with VTI that enables UNIFI master thesis students to conduct further investigations of traffic performance effects utilizing the CoEXist developed tools at VTI.

## 5.5 Cities & Road Authorities

### 5.5.1 Gothenburg

As already shown in the City of Gothenburg's automation-ready action plan (D4.6), Gothenburg works together closely with industry partners such as Volvo and national authorities such as the Swedish Transport Agency. To further enhance this collaboration, the partners are working on setting up interfaces and working structures that allow for effective testing and development processes coherent with the city's adaptive approach. Future and ongoing measures that exploit CoEXist results in Gothenburg are, amongst others, a deep-dive into potential impacts of MaaS and the establishment of C-ITS-related services and digital regulations based on analyses made utilizing CoEXist tools.



## 5.5.2 Milton Keynes

### Policy and planning development

During the lifetime of the CoEXist project, Milton Keynes Council published its new mobility strategy. The strategy development was able to benefit from some of the early outputs from CoEXist, notably the early iteration of the automation-ready framework. This work helped refine policy makers' thinking in developing and creating a new approach to mobility strategy thinking, which now has placed CCAM at the heart of mobility strategy development. CoEXist (final outputs) is also influencing the council's longer-term development strategy. As the city looks towards 2050, with significant growth and development planned, the council has defined a specific 'big' project based around smart, shared sustainable mobility. This project will develop mobility options which include CCAM, and these will in turn will utilise the tools and transport planning (modelling) approach developed in CoEXist.

### Transport Modelling

MKC is about to tender for a new strategic and local transportation model. The features and tools developed in CoEXist (or similar outputs) will be a required feature of any modelling approach that the council tenders. The council's new transport modelling lead, has recently engaged with the wider council team involved in CoEXist to take the modelling approach forward into the council's mainstream transport planning activity.

### Product innovation & commercialisation

Milton Keynes Council has been actively involved in a number of CCAM related innovations including technical development of vehicles to improve performance on 'open' highway in Milton Keynes, these include:

- SWARM: a UK innovate sponsored project to developed self-managing controls to reduce the need for human interventions. This was in collaboration with Aurrigo and Warwick University.
- Starship Robots: a commercial autonomous robot delivery service deployed in several areas of Milton Keynes.
- Park-AV: development (a collaboration between Appyway, Jaguar Land Rover and Coventry city council) of a business case for the deployment of autonomous valet parking. It is perhaps of most relevance to CoEXist as the business case looked at the CoEXist use case 5 (drop off and pick up) as the starting point and considered in detail the commercial factors, and city benefits that could accrue if this form of city centre operation was widespread. A full project summary is available at (<https://its-uk.org.uk/appyway-in-av-valet-parking-solution-consortium/>). The Park AV team had detailed meetings with MKC and Cambridge University to develop business models and understand the potential implications on city roadspace and use.
- Future project: Milton Keynes Council, working with Red Bull Racing based in Milton Keynes, has defined a live trial of the use case 5, using the Red Bull campus carpark as a drop off and pick up zone for a variety of vehicles to access before transferring to a last mile autonomous shuttle. The project will be supported by a new standalone 5G network, and is planned to be operational in mid-2021.



These live projects have utilised the approaches developed in CoEXist to engage with city planners, the legal team and citizens to 'prepare' communities for the deployment of CCAM.

## Academic & teaching

MKC has established a productive and strong working relationship with Cambridge University. Cambridge University were MKC's subcontractor, brought into the CoEXist project to provide specialised transport modelling input. The team at Cambridge were able to work with other consortium members to develop the new approach and since have retained the capability to give ongoing support to Milton Keynes Council and others.

An important extension to the work has been to undertake research into the CoEXist approach to developing assessment tools and methodologies with other developed as part of other research projects, most notably the UK Autodrive project. This research has given a valuable set of insights into the robustness of the CoEXist approach and has to a certain degree validated the work undertaken by technical partners.

### 5.5.3 Helmond

The results of participating in the CoEXist project have given the city of Helmond a lot of knowledge and experience about automated vehicles that can be used in (future) policies and also in implementing measures in street applications. For example, Helmond has learned from its own use cases that when the automated vehicles are advanced enough and can communicate with roadside systems, there is profit to be made in traffic light regulation. This can be used to handle more traffic at an intersection, but also, for example, to set other priorities at an intersection such as more greentime for cyclists and pedestrians without inconveniencing other traffic more. Also, the conclusions of other (macro) use cases are certainly very important to consider when developing policies such as the outcome of the Stuttgart usecase that automated driving represents a challenge for urban transport planning.

Helmond will also disseminate these results in other projects and tests in which they will be involved in the coming years as being a living lab.

Furthermore, Helmond has also learned a lot to be able to calculate developments with automated vehicles with the help of a (micro)simulation model, something that Helmond certainly wants to apply more often to future developments in the city.

### 5.5.4 Stuttgart

Regarding to the Action Plan (including strategy / road map), the following measures are planned for exploitation:

- German version of the Action Plan
- Setting the action plan on the homepage [stuttgart.de](http://stuttgart.de)
- Presentation and discussion especially in the following committees / expert committees:
  - City council (public meeting with press)
  - Stuttgart Region (Department of Transport Planning and Economic Development) regarding joint use and strategy, possible cooperation
  - Working groups of the Ministry of Transport BW (especially in the SDA BW)



- Working groups of the PUM
  - Expert committees of Deutscher Städtetag
- Coordination of a strategy in the mobility working group with the aim of further pilot projects, also in cooperation with resident development and research institutions.
- The Civil Engineering Office and the Integrated traffic management centre (IVLZ) are already preparing further project applications, e.g. in the fields of
  - Strategy-compliant routing,
  - Testing of roadside units to improve road safety.
- Scientific publication in transport journal



## 6 Partners



Universität Stuttgart



City of Gothenburg

Gemeente Helmond



STUTTGART

