



# CoEXist

## Building the capacity of cities to plan for automation -The CoExist automation-ready framework

Session 8B: Planning for automated vehicles

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#H2020CoEXist

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# What is CoEXist?

- **Programme:** EU H2020-ART05
- **Duration:** May 2017 – April 2020
- **Strategic Aim:**

To bridge the gap between automated vehicles (AVs) technology and transportation and infrastructure planning, by strengthening the capacities of urban road authorities and cities to plan for the effective deployment of AVs

**Enable mobility planning towards “automation-readiness”, defined as:**  
*The capability of making structured and informed decisions about the deployment of Connected and Automated Vehicles*

# CoEXist approach



**Automation-Ready  
Transport Modelling**

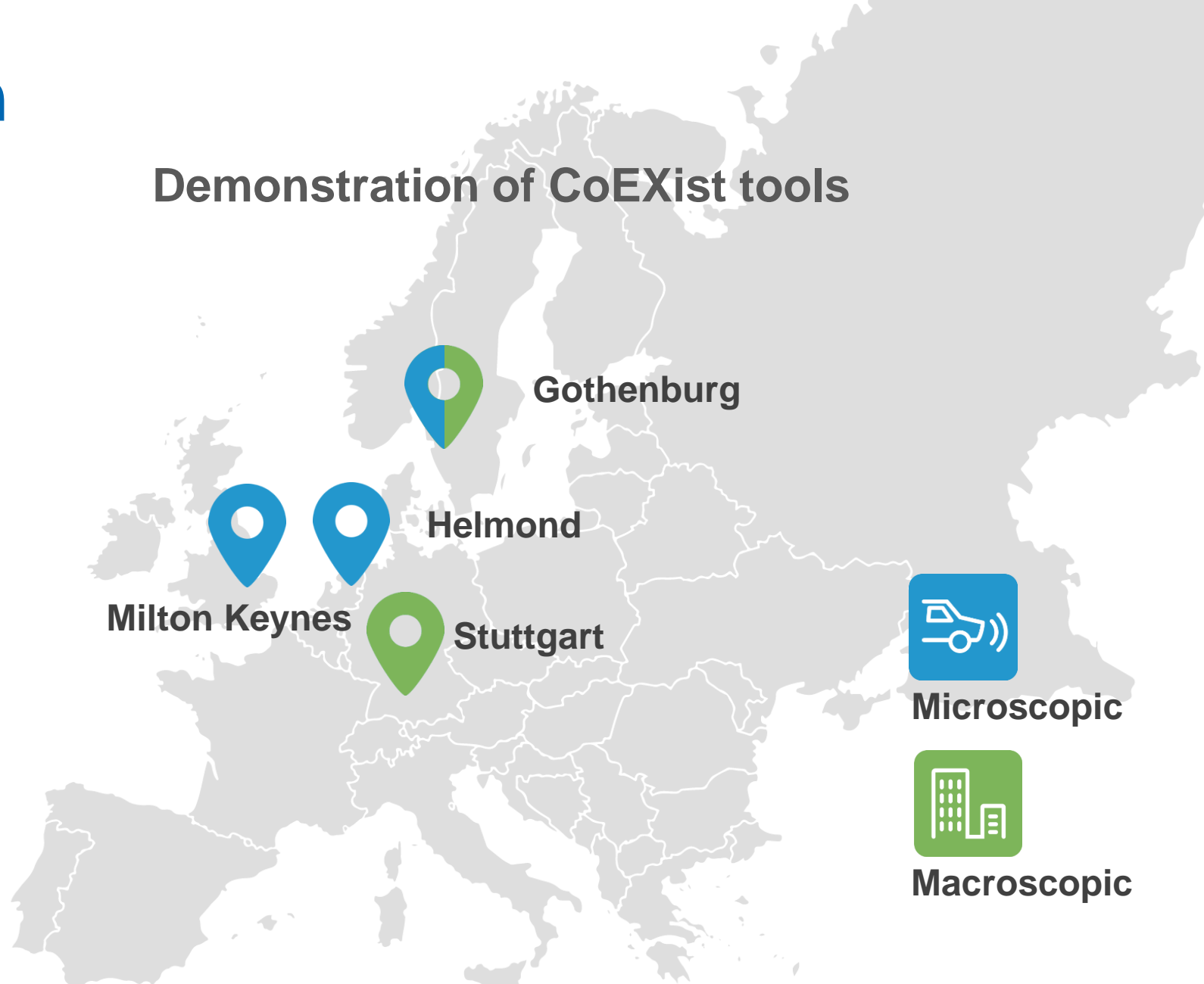


**Automation-Ready  
Road Infrastructure**



**Automation-Ready  
Road Authorities**

## Demonstration of CoEXist tools



**Microscopic**



**Macroscopic**



# Operational specification of AV driving behaviour

Stages of automation characterised by:

- **AV market shares:** *how common are AVs?*
- **AV capabilities:** *where can they drive?*
- **AV driving behaviour:** *how do they drive?*



CAV-behaviours specified by functionally defined **driving logics**: i.e., in terms of **how and where they can operate safely** (disregarding which technologies make this possible).

## CoExist Driving Logics



### Rail-Safe

Stops if anything is on collision course. The vehicle follows a pre-defined path for the whole trajectory.



### Cautious

Calculates gaps accurately and only merges when gaps are acceptable, and it slows down every time its sensors can have blind angles to have no surprises.



### Normal

Behaves as an average driver but with the augmented (or diminished) capacities of the sensors for the perception of the surroundings.



### All-Knowing

Perfect perception and prediction of the surroundings and the behaviour of the other road users. It is capable of forcing its way on other drivers whenever is needed without however ever causing accidents.



# Automation-ready Infrastructure

## CoEXist's Use Cases

### Gothenburg, Sweden

- Shared spaces
- Accessibility during long-term construction works



### Helmond, the Netherlands

- Signalised intersection including pedestrians and cyclists
- Transition from interurban highway to arterial



### Milton Keynes, United-Kingdom

- Waiting and drop-off areas for passengers
- Priority Junction Operation (roundabouts)



### Stuttgart, Germany

- Impacts of CAVs on travel time and mode choice on a network level
- Impact of driverless car- and ridesharing services

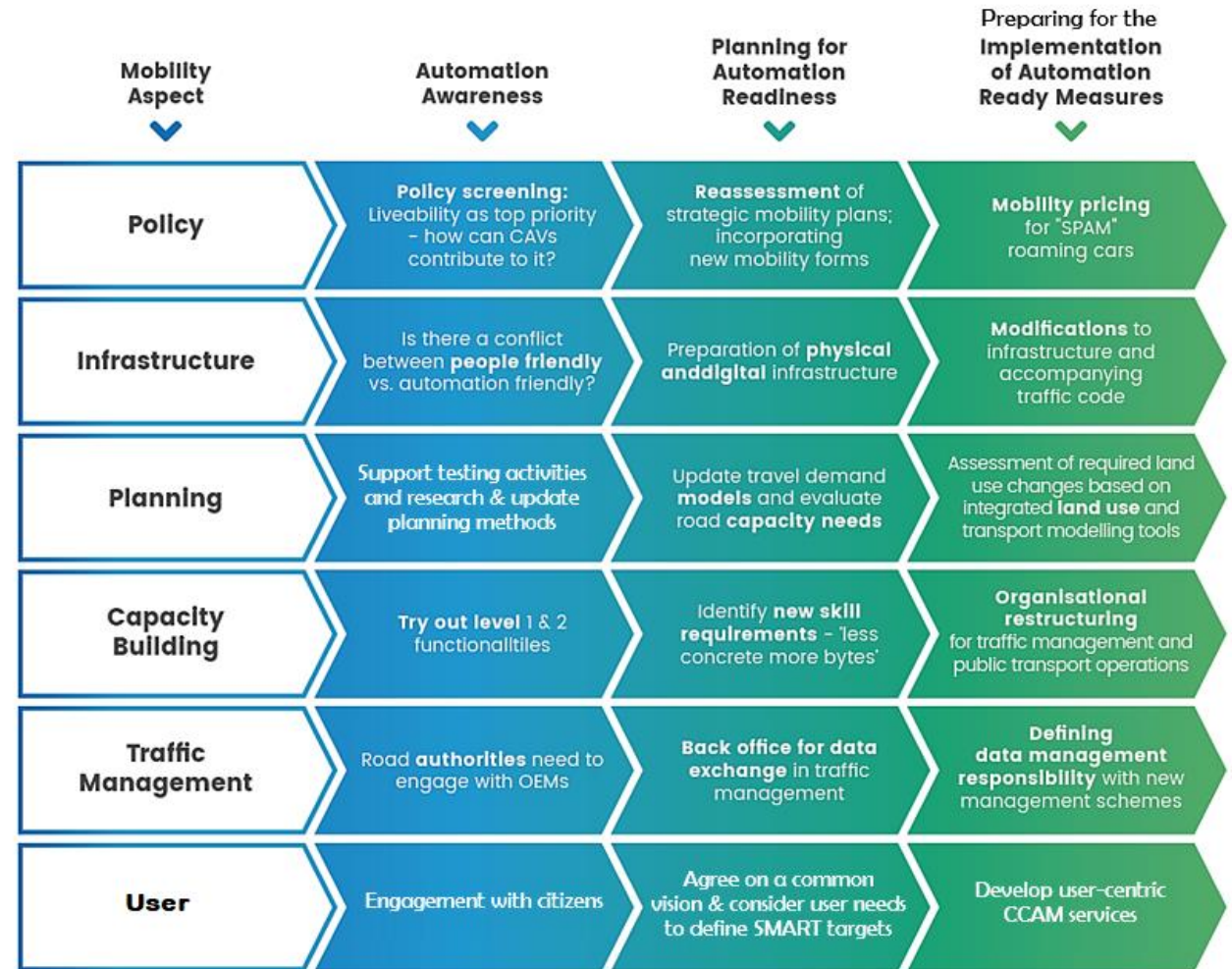


# Automation-ready framework

Reduce uncertainties through:

- Guidance on technology, analysis methods, impacts and measures
- Informed decision-making about automation
- Automation FAQ for cities

Further guidance:



Overview of the phases towards automation-readiness, with examples of measures and relevant questions to guide the analysis

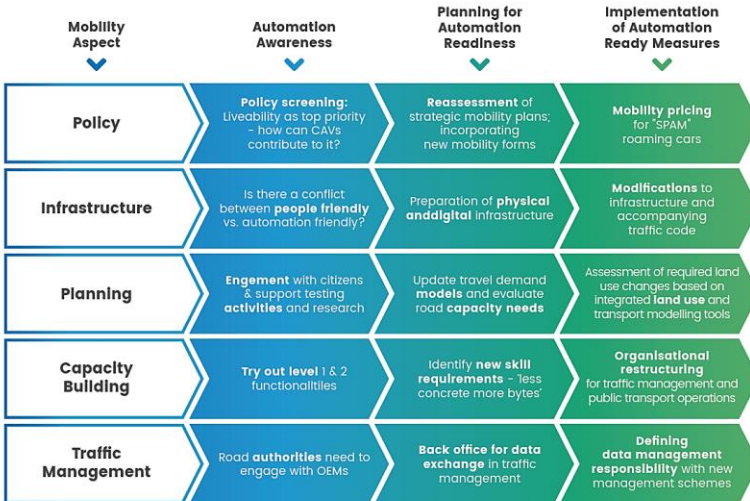




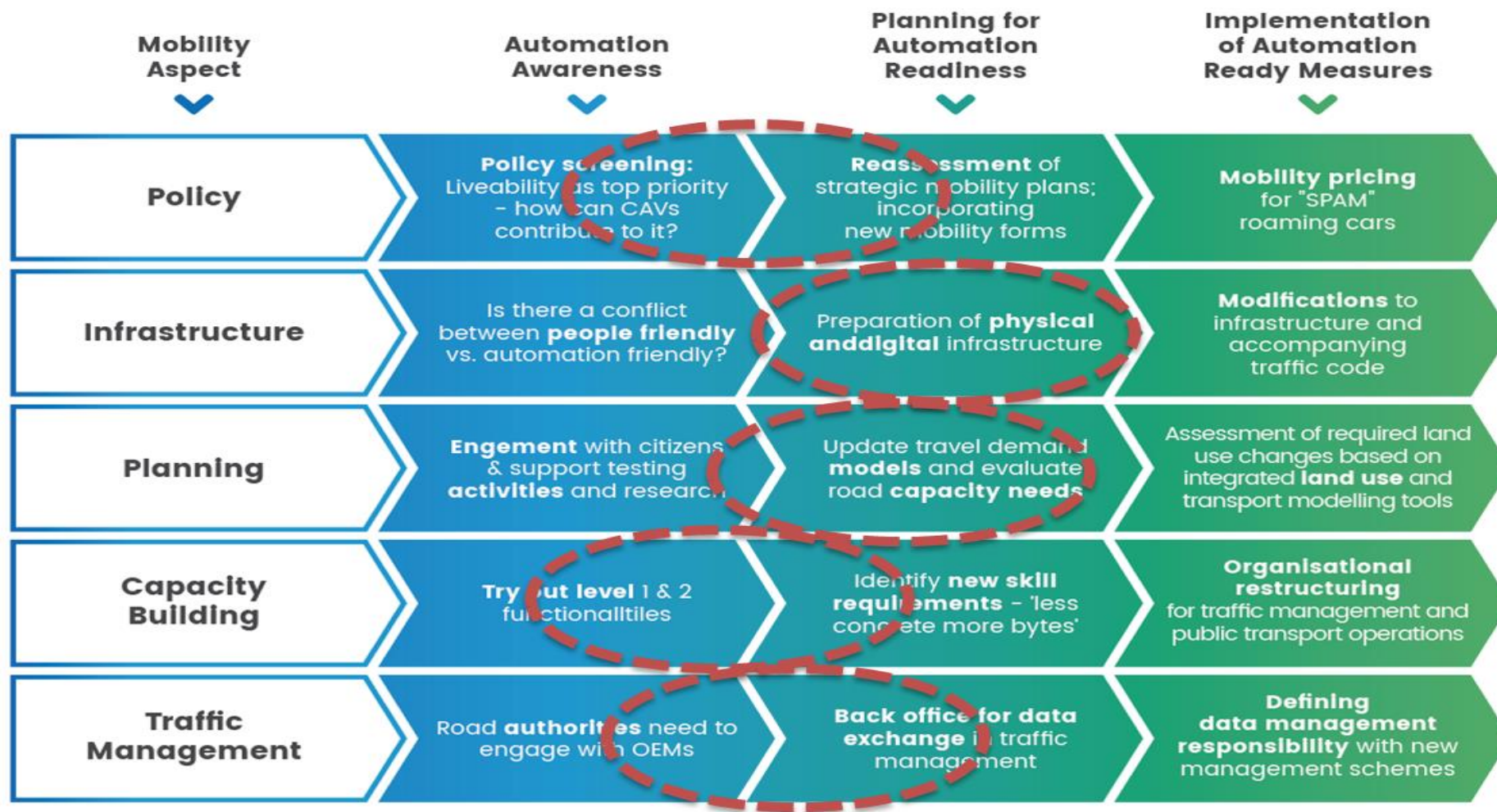
# Phase 1: Automation awareness creation – Automation readiness self-assessment as basis

## Preparation and analysis

- Self-assessment
- Capacity development needs?
- How to communicate effectively with citizen's, stakeholders, between public sectors/institutions?
- Resources and tools required?
- Knowledge/data gaps?

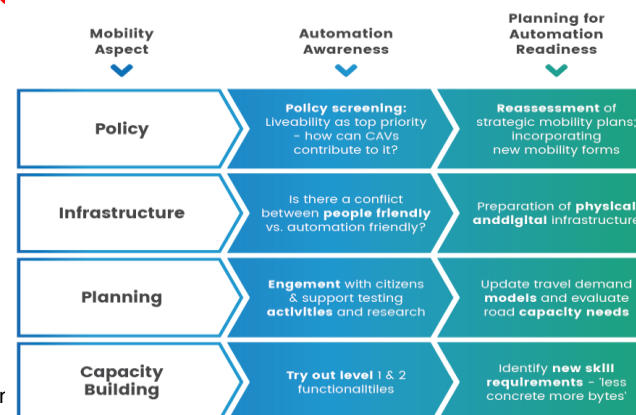
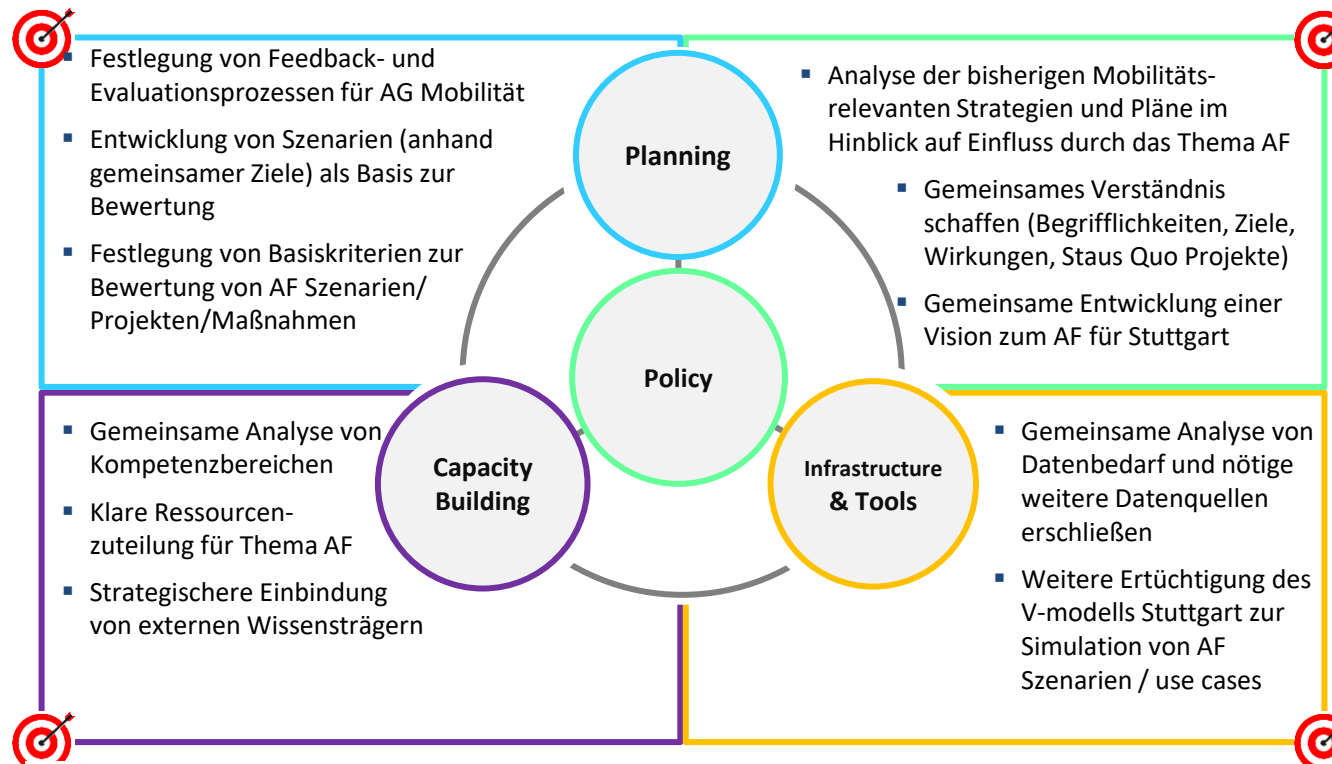


# CoEXist automation-ready forum - Gothenburg





# CoEXist automation-ready forum - Stuttgart



# Key findings CoEXist

## Reduce uncertainties:

- **Automation-ready modelling as entry point: robust modelling of high-level scenarios for CCAM deployment supports decision making**, considering digital and physical road infrastructure (where), type of services (how), level of automation and market penetration rates (when).

## Prepare for transition phase (CoExistence of CAVs and CVs):

- Due to decreased traffic performance in the introductory stage linked to cautious CAV behavior, regulate where CAVs are allowed to operate & decide which infrastructure elements' automation-readiness to prioritise
- Further advance the development of **standardized and interoperable C-ITS** capabilities, which can **benefit traffic performance** and **enable enhanced traffic management**, both for automated and conventional vehicles.
- **Importance of preparing for negative impacts during transition phase:** proactive approach to anticipate such issues and regulate CAV deployment



# Key findings CoEXist

- **Assess your automation-readiness** to support policy makers to take active role and to **create joint understanding** in shaping CCAM scenarios
- **Focus on the (preliminary) certainties** derived from modelling and empirical assessments or general use-case based scenario building of CAV impacts, to facilitate decision-making **and identify no-regret options for policy and infrastructure for CAVs**; in particular for the transition phase
- Develop **data sharing strategies** for cross-sectoral and public-private cooperation **to enable informed decision-making**
- Steer development of CCAM deployment from a **mobility objectives (SUMP goals!) and business model perspective** while steering innovation to solve current problems (e.g. carbon-neutrality, covid-19 crisis)





# Thank you for your attention!

## Get in touch with us!

[www.h2020-CoEXist.eu](http://www.h2020-CoEXist.eu)

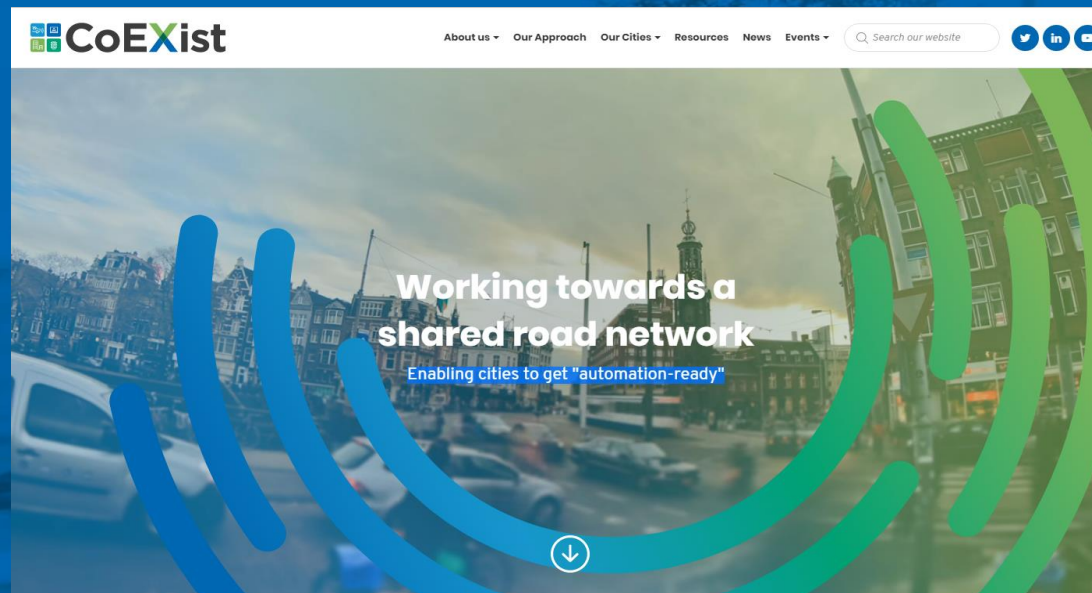


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# CoEXist Partners

