The aim of INTO-CPS project is to create an integrated "tool chain" for comprehensive Model-Based Design (MBD) of Cyber-Physical Systems (CPSs). The tool chain will support the multidisciplinary, collaborative modelling of CPSs from requirements, through design, down to realisation in hardware and software. This will enable traceability at all stages of the development.

INTO-CPS will support the holistic modelling of CPSs, allowing system models to be built and analysed that would otherwise not be possible using standalone tools. We will integrate existing industry-strength tools with high Technology Readiness Levels (TRL 6–9) in their application domains, based centrally around Functional Mockup Interface (FMI)-compatible co-simulation. The project focuses on the pragmatic integration of these tools, making extensions in areas where a need has been recognised. The tool chain will be underpinned by well-founded semantic foundations that ensures the results of analysis can be trusted.

The tool chain will provide powerful analysis techniques for CPSs, including connection to SysML generation and static checking of FMI interfaces, model checking in the Loop (HiL) and Software-in-the-Loop (SIL) simulation, supported by code generation. The tool chain will allow for both Test Automation (TA) and Design Space Exploration (DSE) of CPSs. The INTO-CPS technologies will be accompanied by a comprehensive set of method guidelines that describe how to adopt the INTO-CPS approach, lowering entry barriers for CPS development.

To ensure that the INTO-CPS technology is applicable to as wide a number of value chains as possible, the four case studies have been selected from four distinct domains: railways, agricultural, building automation and automotive. Even if the target products of these case studies have been designed and developed previously, they are all different by nature with different technical objectives (operating metro doors without injuring people, ensuring an efficient seeding, running reliable air-cooling facilities, reducing energy consumption and emissions).

The focus in the execution of the case studies will be the evaluation of the INTO-CPS technology. The actual case studies that have been chosen and their innovative CPS angle:

- Aarhus University (AU)
- Newcastle University (UNEW)
- University of York (UY)
- Linköping University (LIU)
- Verified Systems International (VSI)
- Controllab Products (CLP)
- ClearSy (CLE)
- TWT GmbH - Science & Innovation (TWT)
- Kongskilde Industries (KK)
- United Technologies (UTRC)
- Softeam (ST)