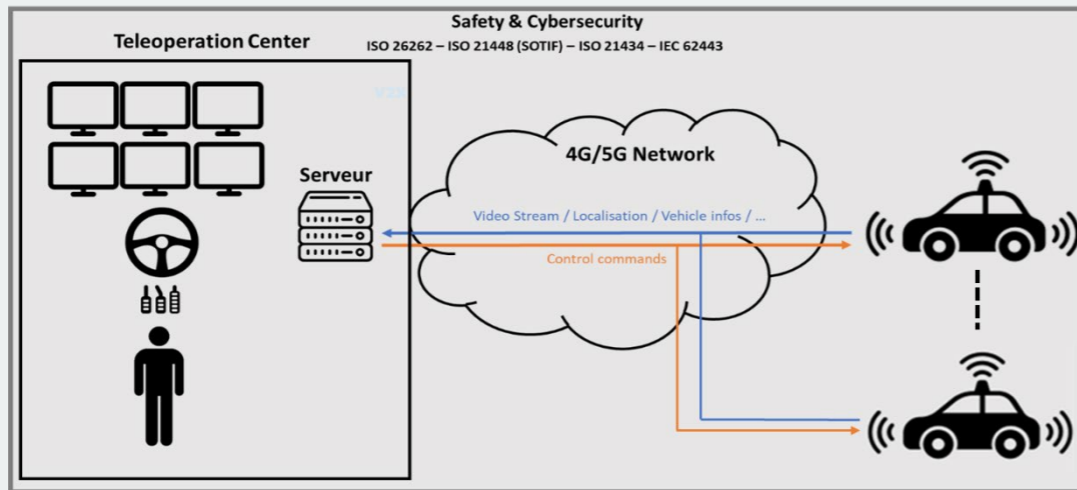# Project Teleoperation

Development and implementation of a centralised teleoperation concept for remote control of automated and connected vehicles based on safety and cyber security requirements

Context

To date, several public transport operators (SBB, PostAuto, TPF) have carried out tests related to automated vehicles in Switzerland. While these tests have certainly enabled each operator to acquire valuable technical, operational and organizational know-how, this individualistic and costly approach seems to have reached a "break-even point". A coordinated and scalable solution to successfully implement efficient mobility of a national level is currently lacking.

Objectives

The solution is to enable a remote operation control center which can teleoperate any vehicle at once. Therefore, this project aims to develop a teleoperation concept adapted to automated vehicles. To achieve this, the project team has worked ond the following workpackages :

1. Business case and social acceptability analysis of teleoperation
2. Development of the teleoperation system at the conceptual level
3. Development and integration of the automated security functions required for remote operation with the demonstrator
4. Adjustment and configuration of the chassis and bodywork
5. Verification and validation
6. Authorization of the entire system

Impacts

The regional and national economy will benefit in many ways:

- Recognition of SwissMoves to become a national leader in the implementation of teleoperated vehicles
- Strengthening the Ra&D capacity of SwissMoves
- Strengthening the position and services of the project's partners
- Developing a strong scalable solution to enable efficient mobility on a national level

Partners

tpf	Laura Andres, Marino Grisanti, Marc Striffeler
SBB CFF FFS	Zoltan Laszlo, Carolin Holland
PostAuto	Martin Neubauer, Christoph Zeier
RUAG	Thomas Nussbaumer
CERTX	Amin Amini, Jens Henkner, Kilian Marty
cluster food & nutrition	Nadine Lacroix Oggier
DTC Dynamic Test Center	Bernhard Gerster, Peter Affolter, Marcel Strub, Reto Röthlisberger
UNIFR UNIVERSITÉ DE FRIBOURG UNIVERSITÄT FREIBURG	Thomas Probst
HAUTE ÉCOLE DE GESTION HOCHSCHULE FÜR WIRTSCHAFT SCHOOL OF MANAGEMENT Fribourg Freiburg	Maurizio Caon, Mélanie Thommet
HEIA-FR HTA-FR ROSAS Center Fribourg SeSi Sustainable Engineering Systems Institute iTEC Institute of Construction and Environmental Technologies iSIS Institute of Smart and Secured Systems	Roland Scherwey, Vincent Bourquin, Marc-Antoine Fénart, Wolfgang Berns, Gabriel Python, Laurent Pichon, Oliver Nahon, Sylvain Rhême, Jonathan Hendriks, Frédéric Schenker, Samuel Rieder, Lucio Truaisch, Celso Cippà, Ivan Baeriswyl, Jan Huber, Timothy Rayroud

Teleoperation Concept

Cyber Security Requirements

Verification and validation

Authorization process

Testing of Teleoperation
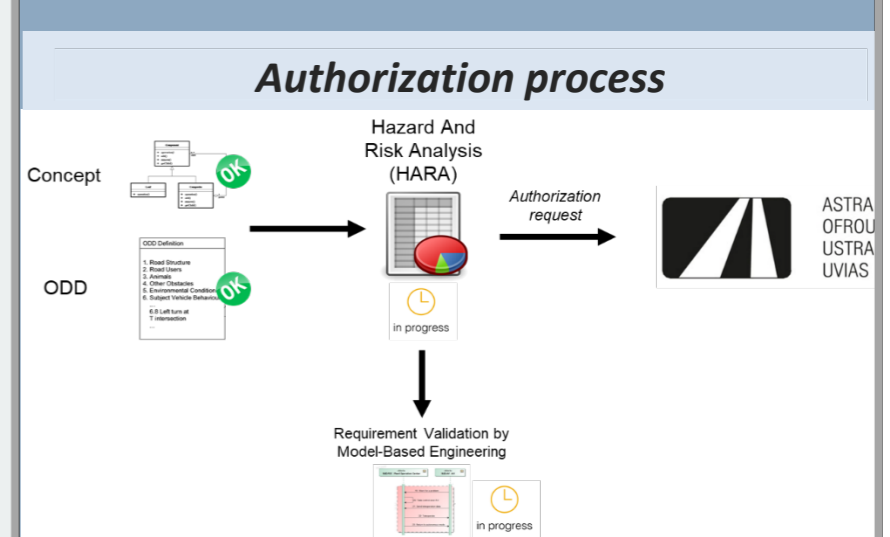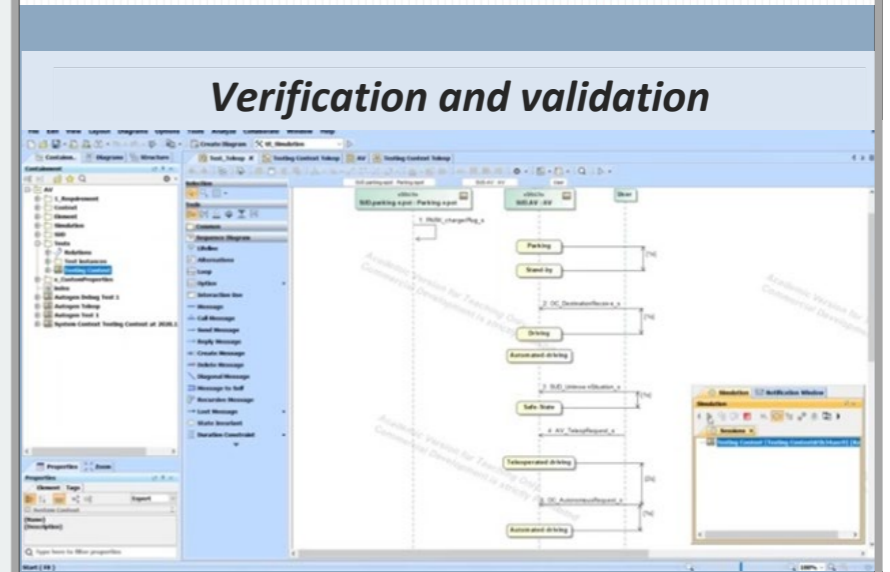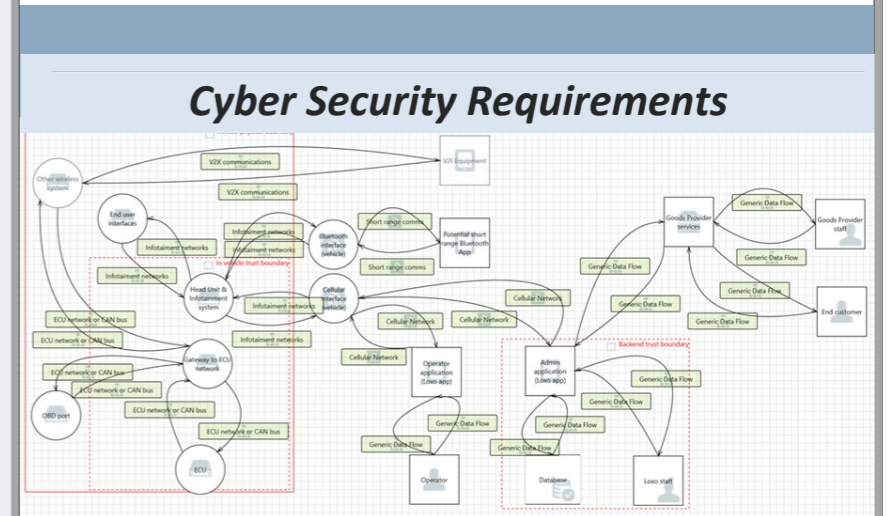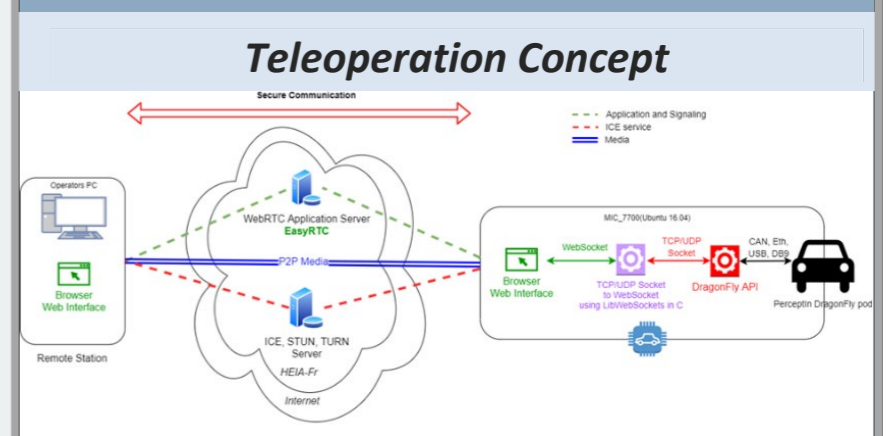
Research domain
Automated and Integrated Mobility

Project leader
Roland Scherwey / Gabriel Python

Project duration
10 months

Amount allocated
248'300.-