

# Development Of HiL test Environment

For Validation Of ADAS, Chassis ECU Functionalities

*Inspired by Future Mobility*

January-  
2019





## Objective

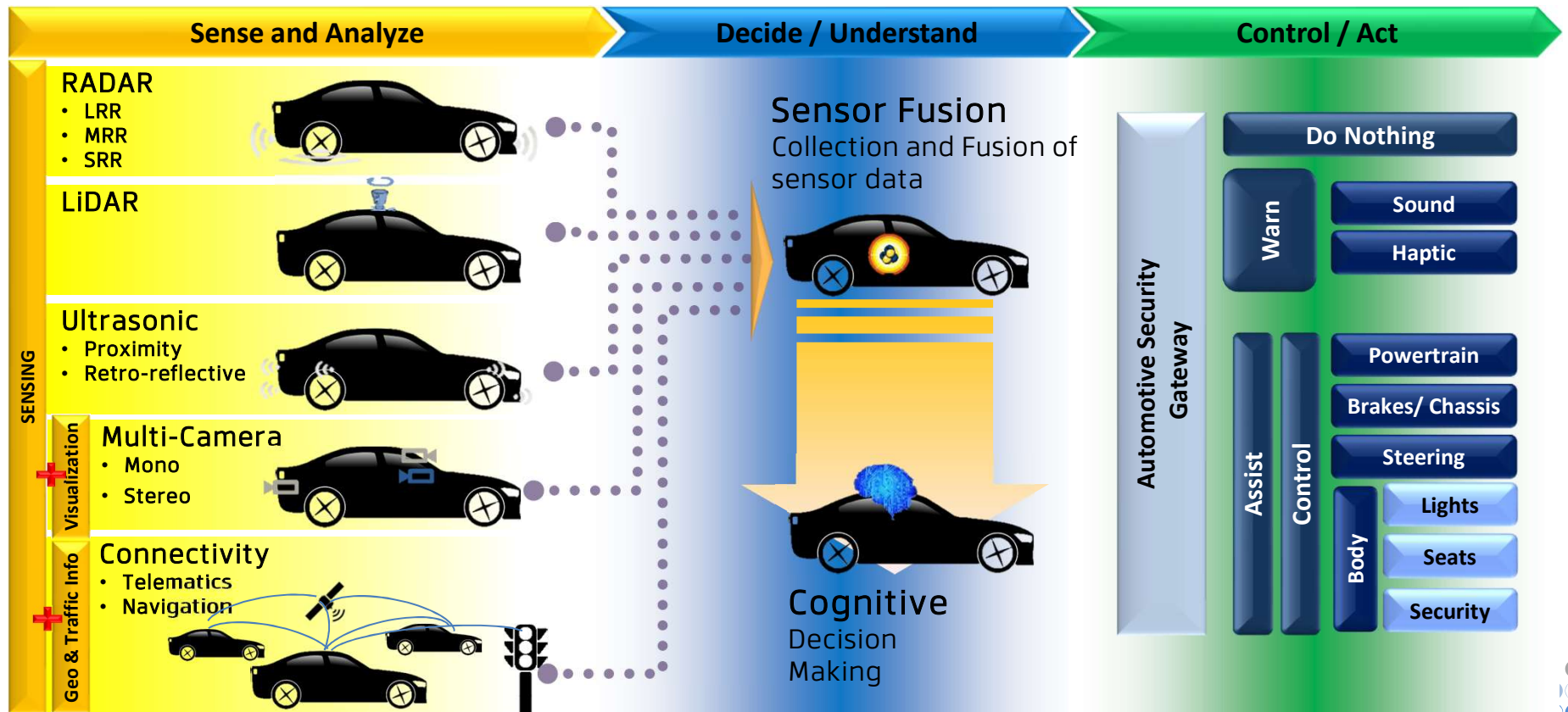
**An integrated test environment based on HiL Environment for validating an autonomous vehicle functionality.**

- Setting up fully functional test system for validation of ADAS, Chassis and safety functions like Rear Collision Warning (RCW), Cross Traffic Alert, Blind Spot Detection, Surround View, Adaptive Cruise Control (ACC), Automatic Emergency Braking, Lane Keep Assist(LKA) etc. with accurate results.
- The simulation of all the subsystems and controllers (the representatives of the actual test vehicle) is achieved by the integration of real-time co-simulation environment created using the CarMaker-Simulink software's, through the dSPACE HIL simulator equipped with custom designed load modules.
- The ECUs integration process at both hardware and software level unites the various subsystems modelled in different platforms(like MathWorks Simulink & IPG CarMaker) onto the single compatible HiL platform.
- Automation test scripts are written to execute different test scenarios on the test setup, read the data repository and give pass/fail verdict using the automation framework.





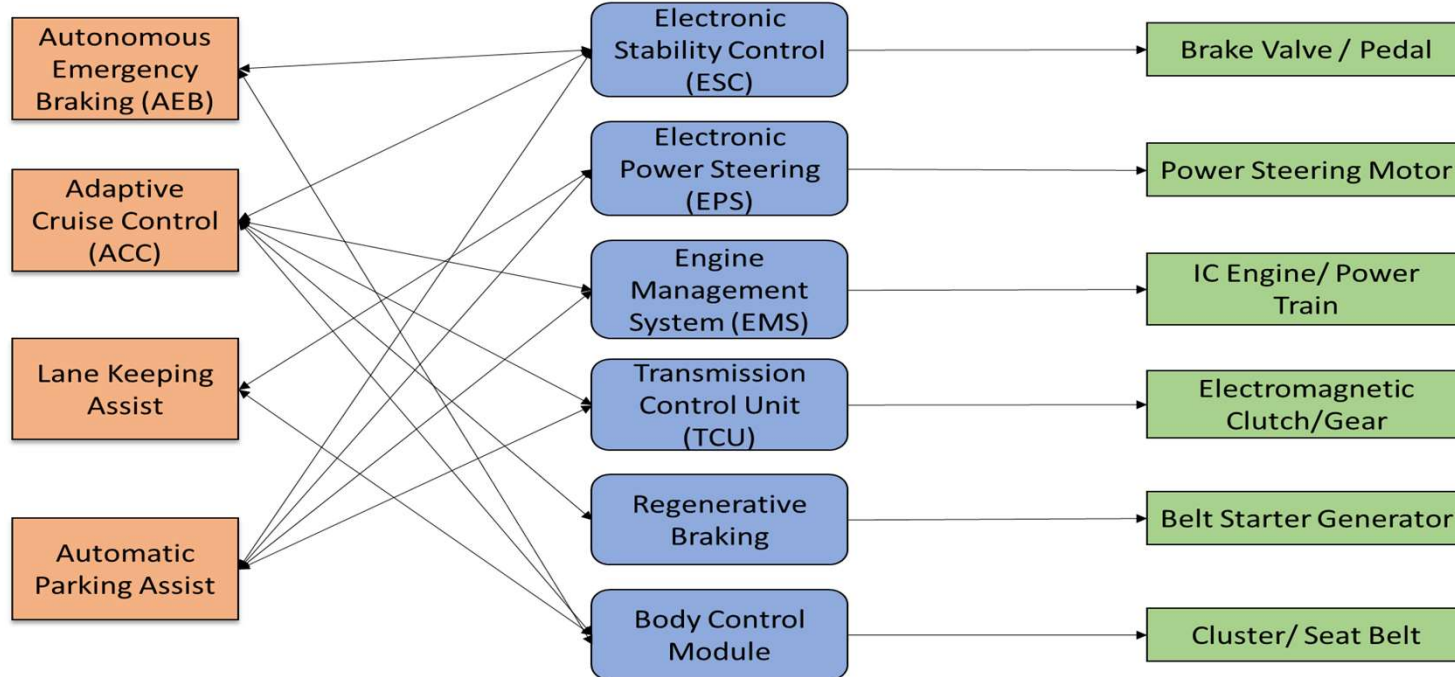
# ADAS Overview





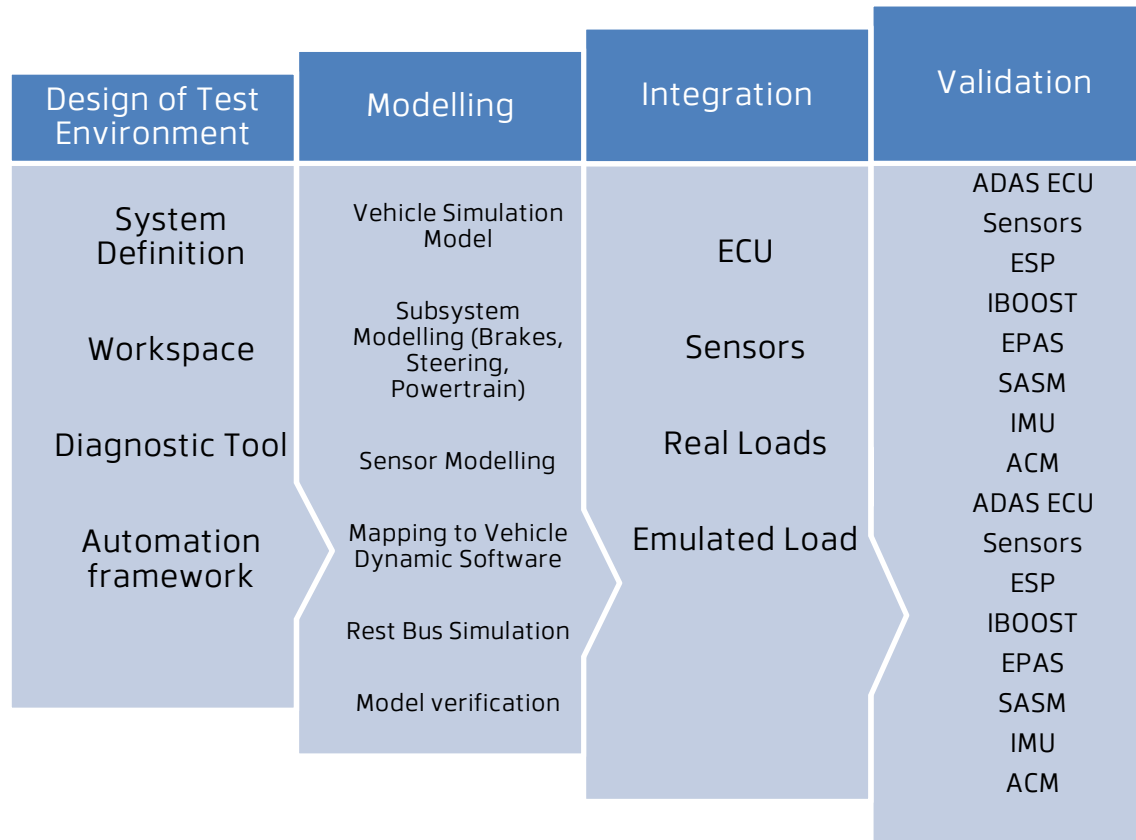
## Challenges in ADAS Chassis HiL Development

ADAS involves distributed functional implementations across domains, which leads to exponential complexity in testing the interdependent functions





## Process Overview

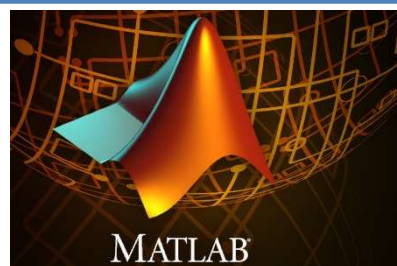




## Tools Used

### Design of Test Environment

- System Definition
- Workspace
- Diagnostic Tool
- Automation framework

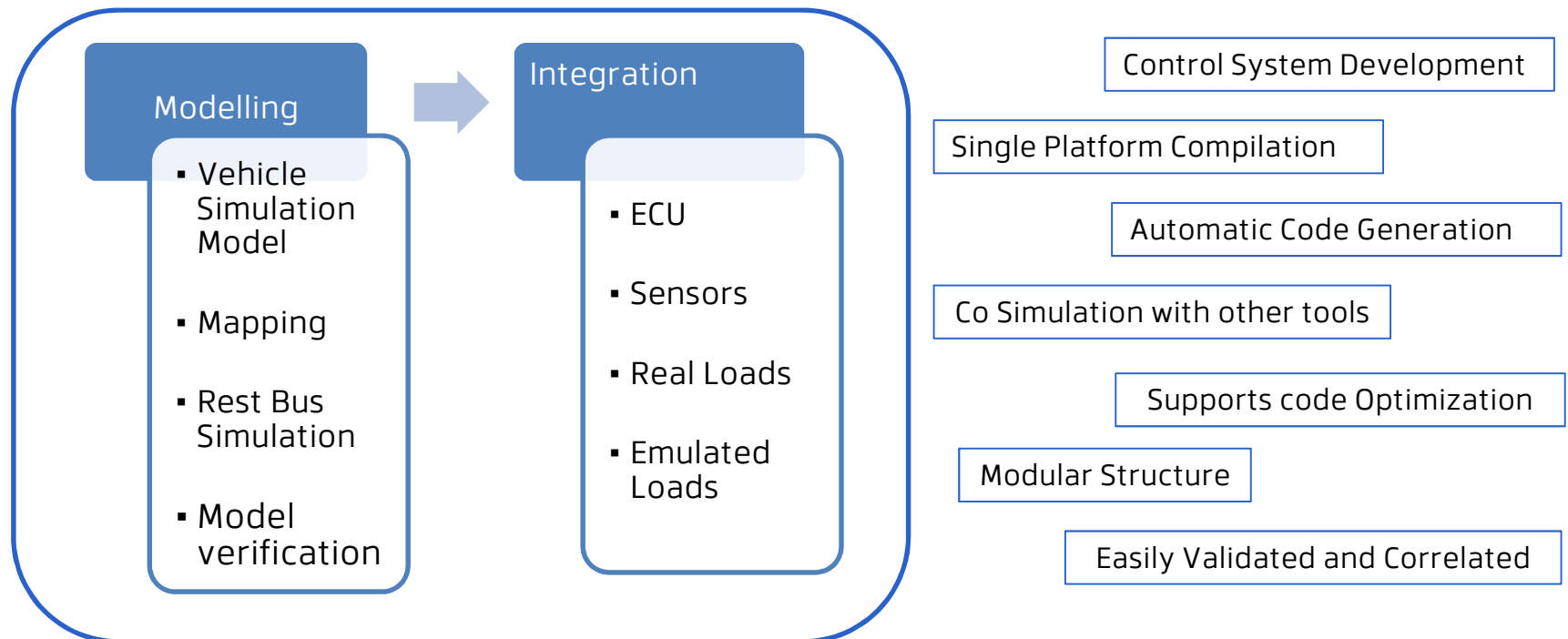


Customer  
Specific  
Diagnostic  
Tool



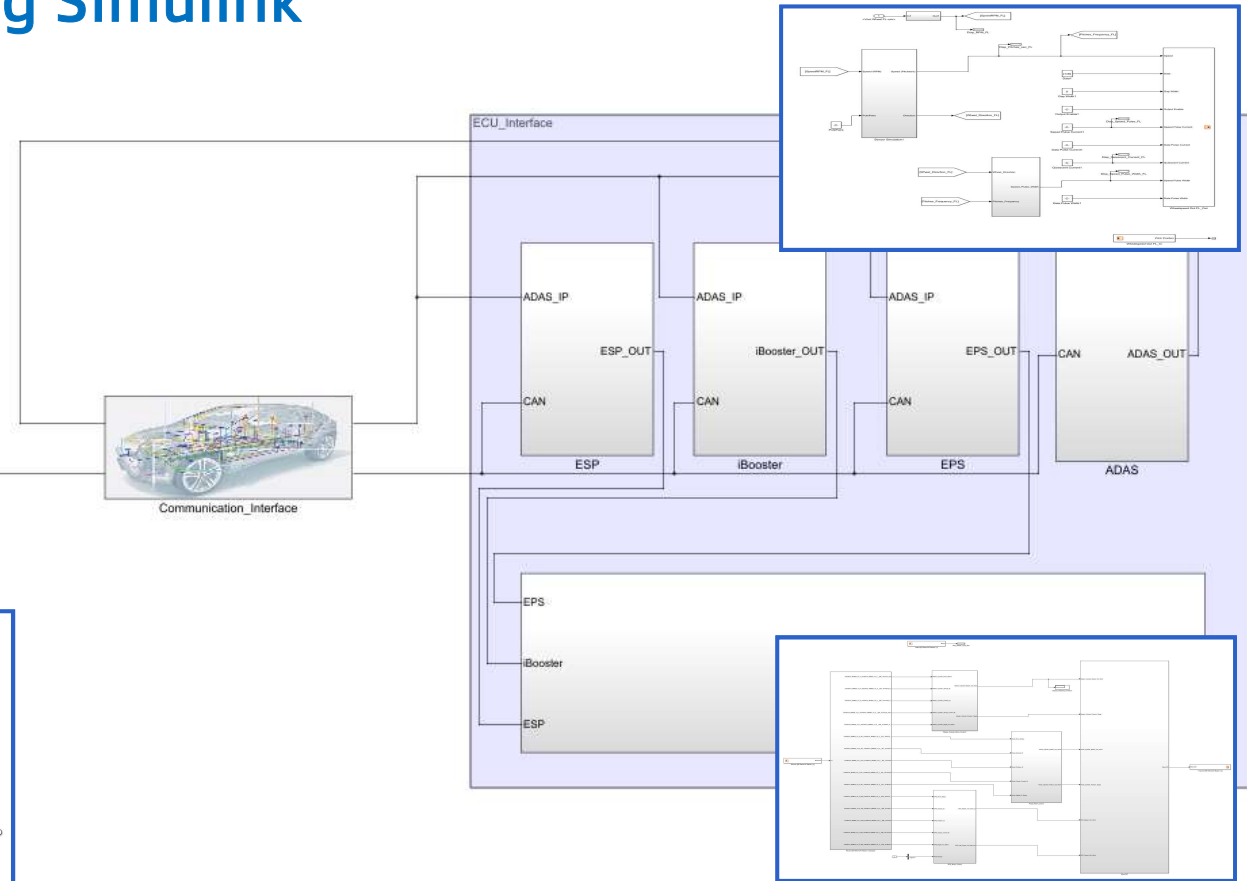
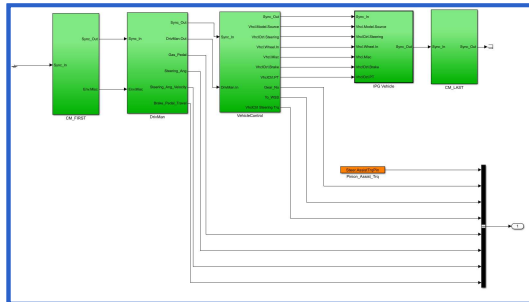
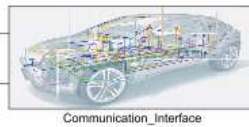
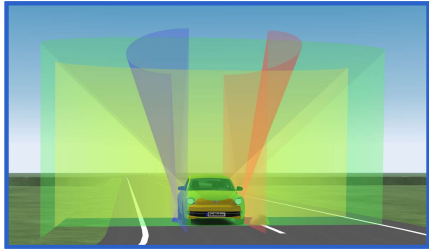


## MathWorks Tools Involvement





# Modelling Using Simulink



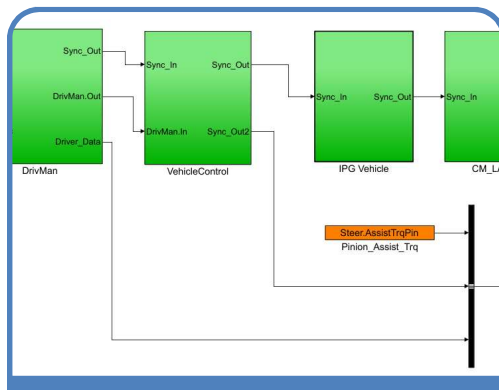
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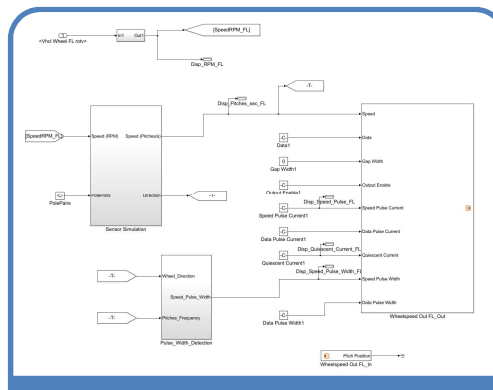




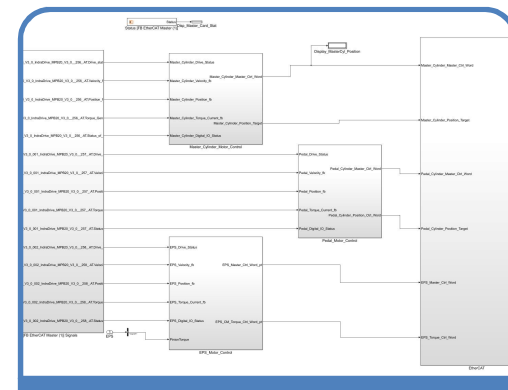
# Modelling Using Simulink



Vehicle Model



Sensor Modelling

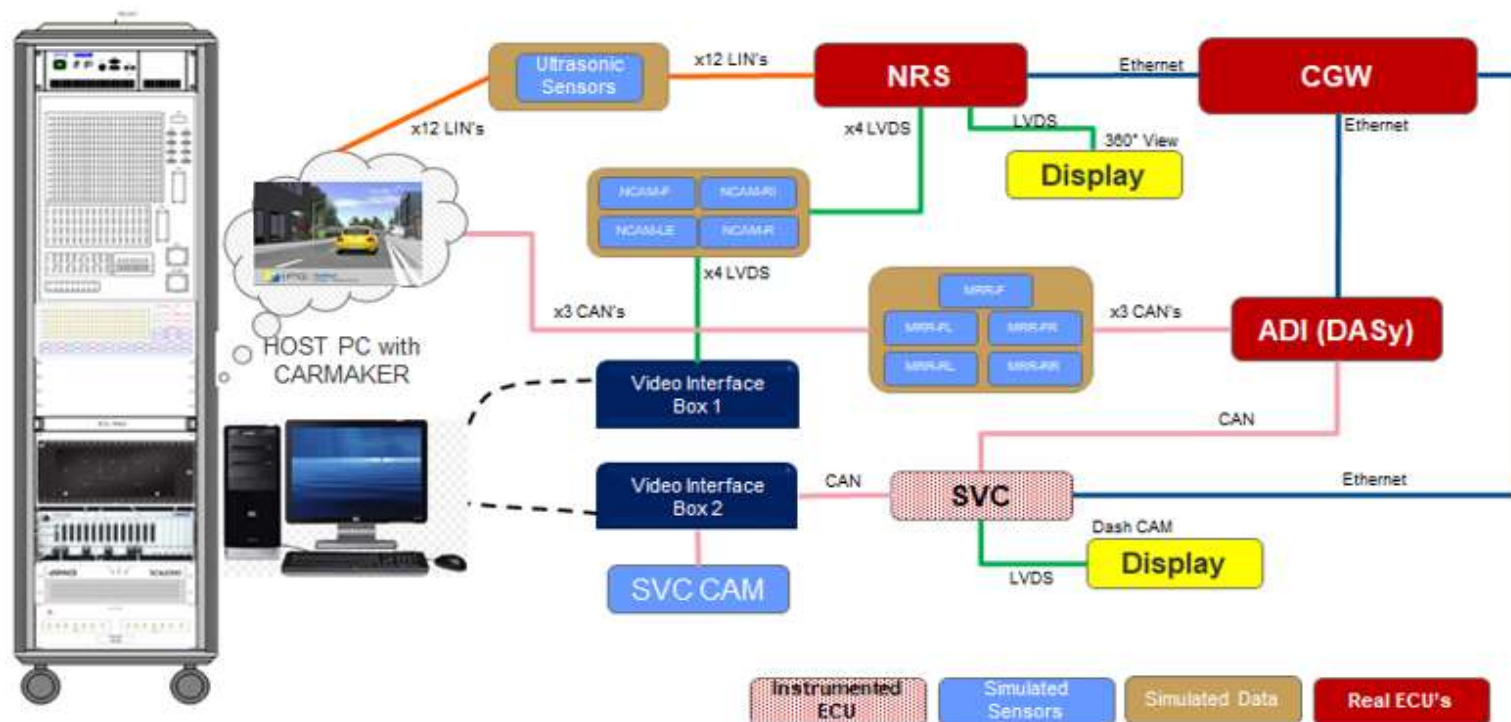


Control Drive Modelling





## INTEGRATED CENTRAL ADAS HIL APPROACH





## Results



**TBD**

The target vehicle is under development, thus the complete vehicle data is not available and is expected to be available by end of March.

The result analysis will be available in the final presentation.





THANK YOU

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