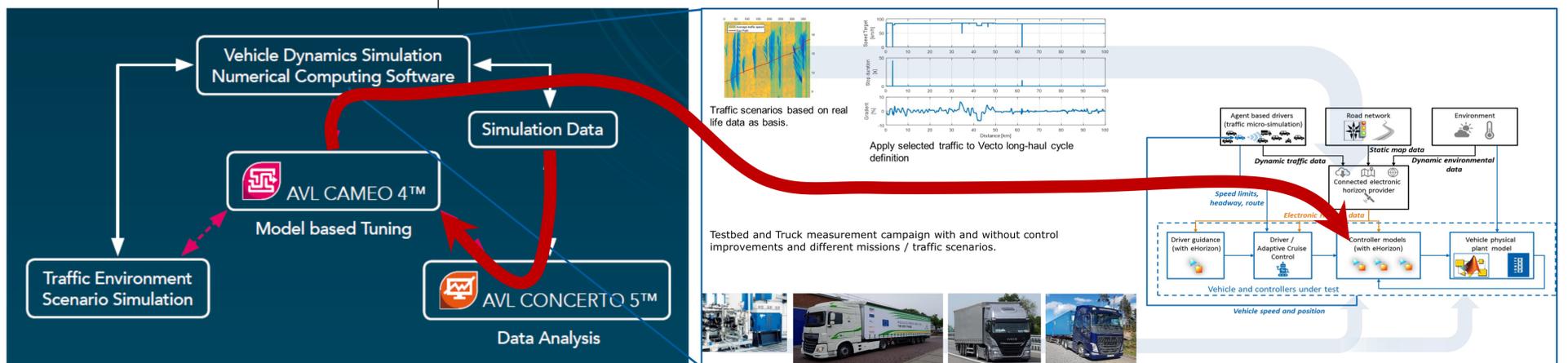


KPI model based calibration and validation

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| <p>Challenges and solutions:</p> | <p>Predictive Control Systems, which are interacting with the surrounding traffic cannot be developed on the road, where the traffic situations will change in an unlimited and unpredictable way, and not all scenarios can be tested safely.</p> <p>There is the need to</p> <ol style="list-style-type: none"> 1) Bring the road situation into a verifiable simulation environment 2) Make effective use of the simulation environment to effectively cover the various different development tasks: <ol style="list-style-type: none"> a) If completely randomized, the majority of the simulated results will likely not produce a result relevant to the development target (eg near miss incident) b) More intelligent techniques are required to ensure that all relevant or interesting scenarios are modelled (e.g. with active DoE) 3) Track the parameterization of the simulation environment carefully <ol style="list-style-type: none"> a) Legislation requires that there is proof that a scenario has been tested |
| <p>IMPERIUM's contributions:</p> | <p>The use of a simulation platform as provided by WP1 for assessing the status of a "Vehicle system under test", using methods common in control unit calibration (typically on test bed), has shown its potential by getting good validated results for 12 vehicle variants.</p> <p>This methodology can be used in future for both:</p> <ol style="list-style-type: none"> a) The further development of the Calibration of the multiple control layers <ol style="list-style-type: none"> 1) Velocity optimizer 2) Energy Management Supervisor 3) Predictive control of the components involved (engine, air supply, e-Motor, battery) b) For validation of "black box systems" under systematically changing traffic scenarios – as executed during WP 6 |
| <p>Impact / what's next:</p> | <p>Develop SW-Tools supporting the development and calibration engineers working on their respective topics. Current plan:</p> <p>→ Integrate the "Active DoE-Procedure" of the calibration tool AVL CAMEO with the simulation environment</p> <p>→ E.g. fro Calibration application:</p> |



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