

EAST-ADL Introduction

Requirements, Constraints and
Verification & Validation



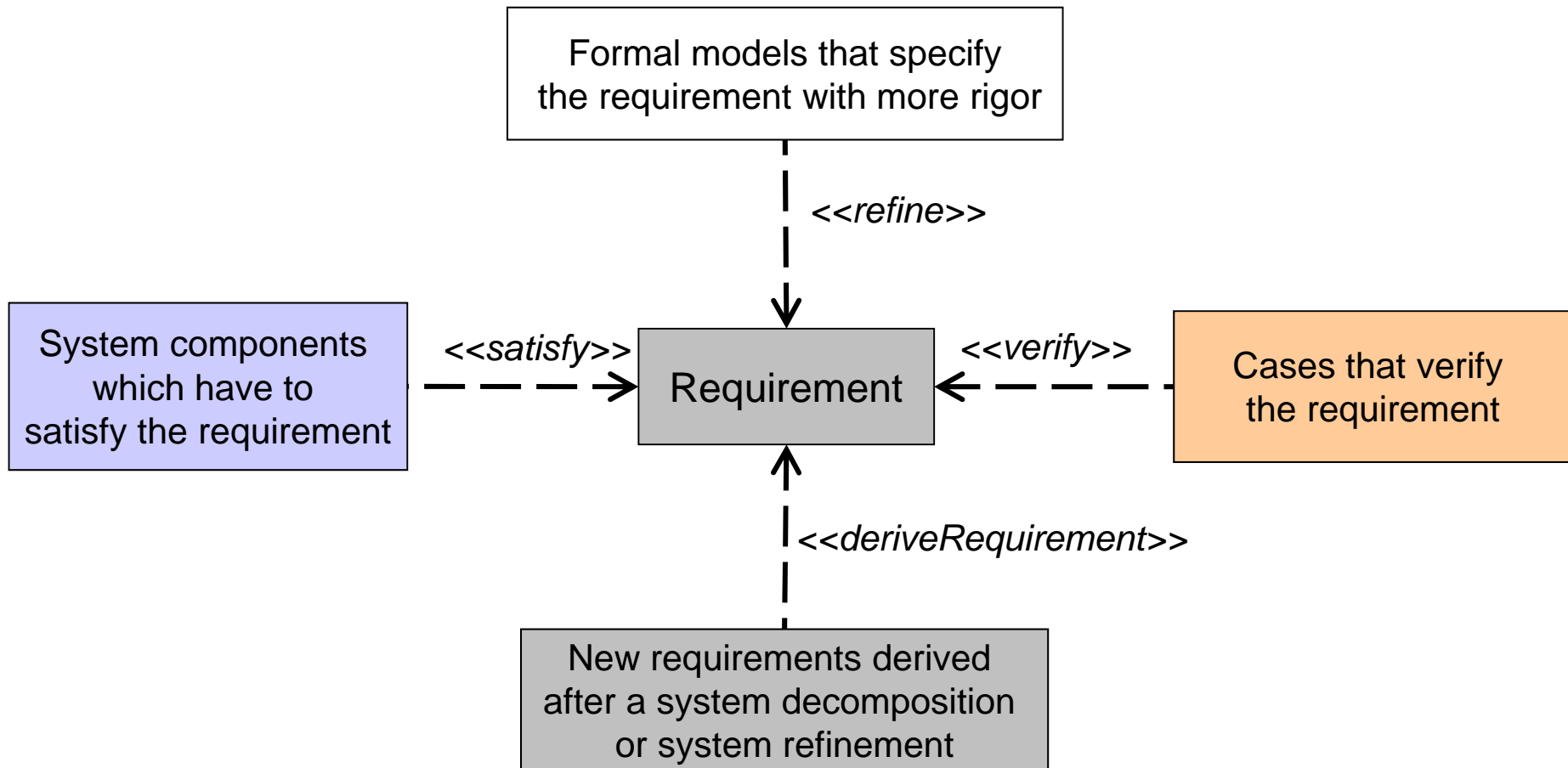
Requirements introduction

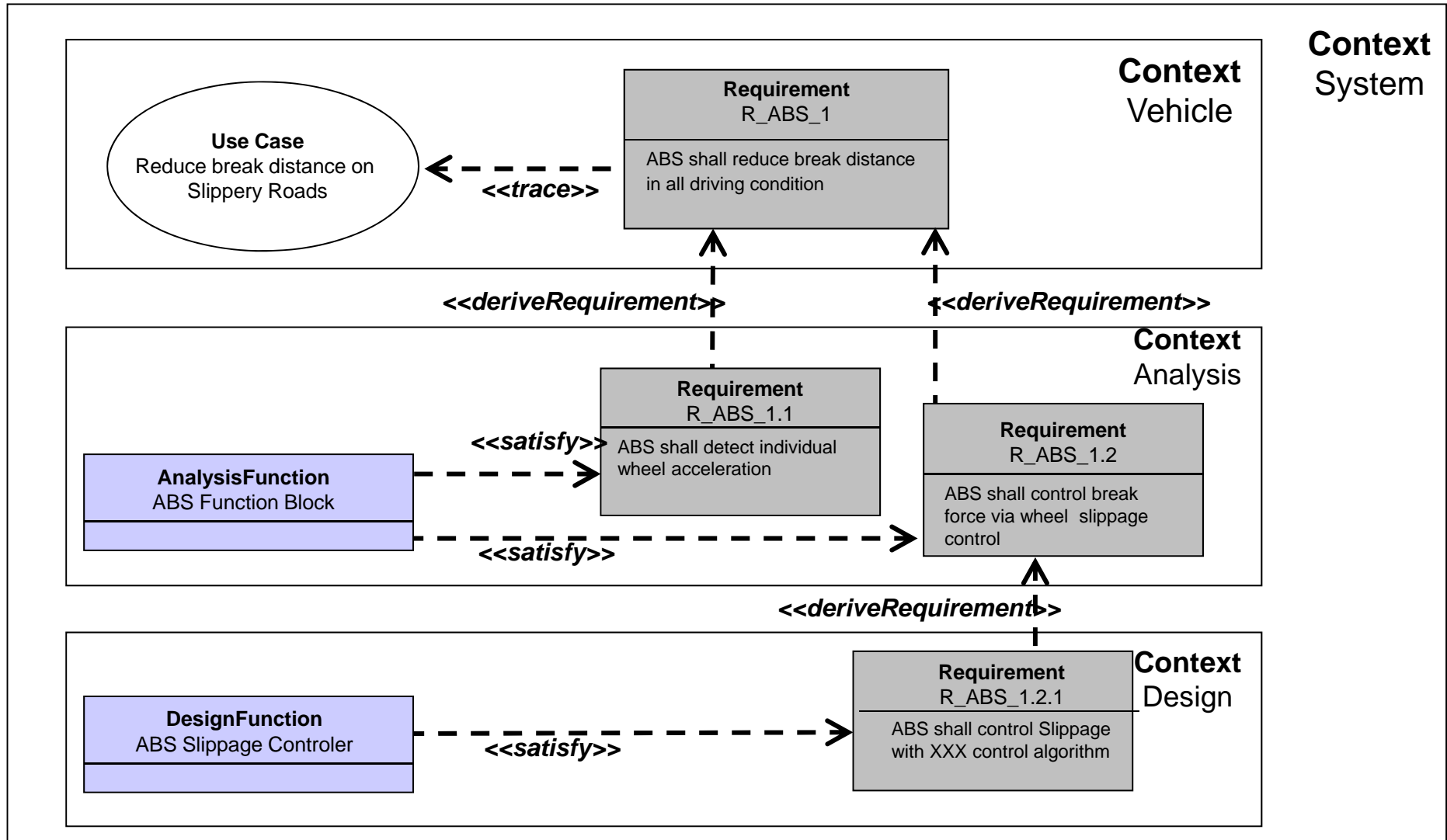
Requirements express conditions or capabilities that must be met or possessed by a system or system component to satisfy a contract, standard, specification or other formally imposed properties.

Requirements and Architecture

- The core EAST-ADL model captures basic structure of system
- Requirement elements annotate model to identify mandatory aspects
- Requirement elements relate requirements engineering information to architectural model

Requirements – basic relations

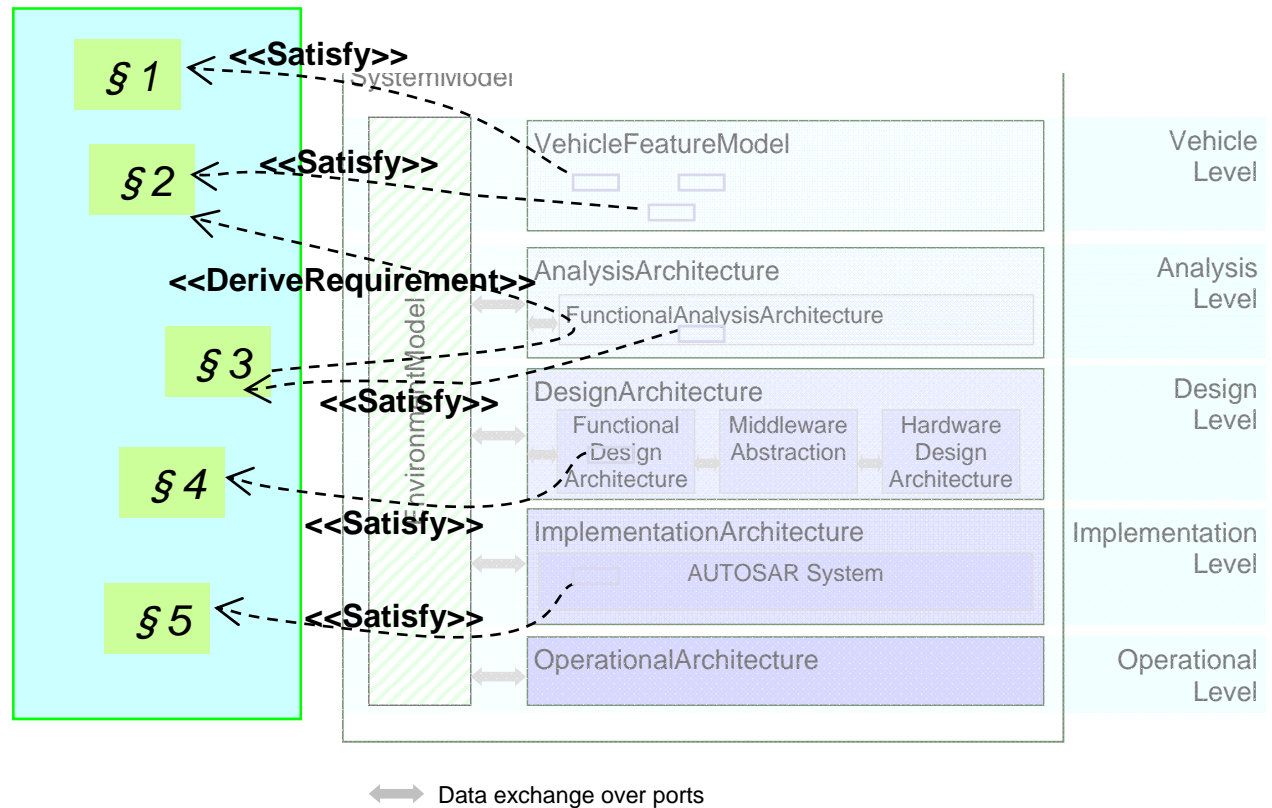




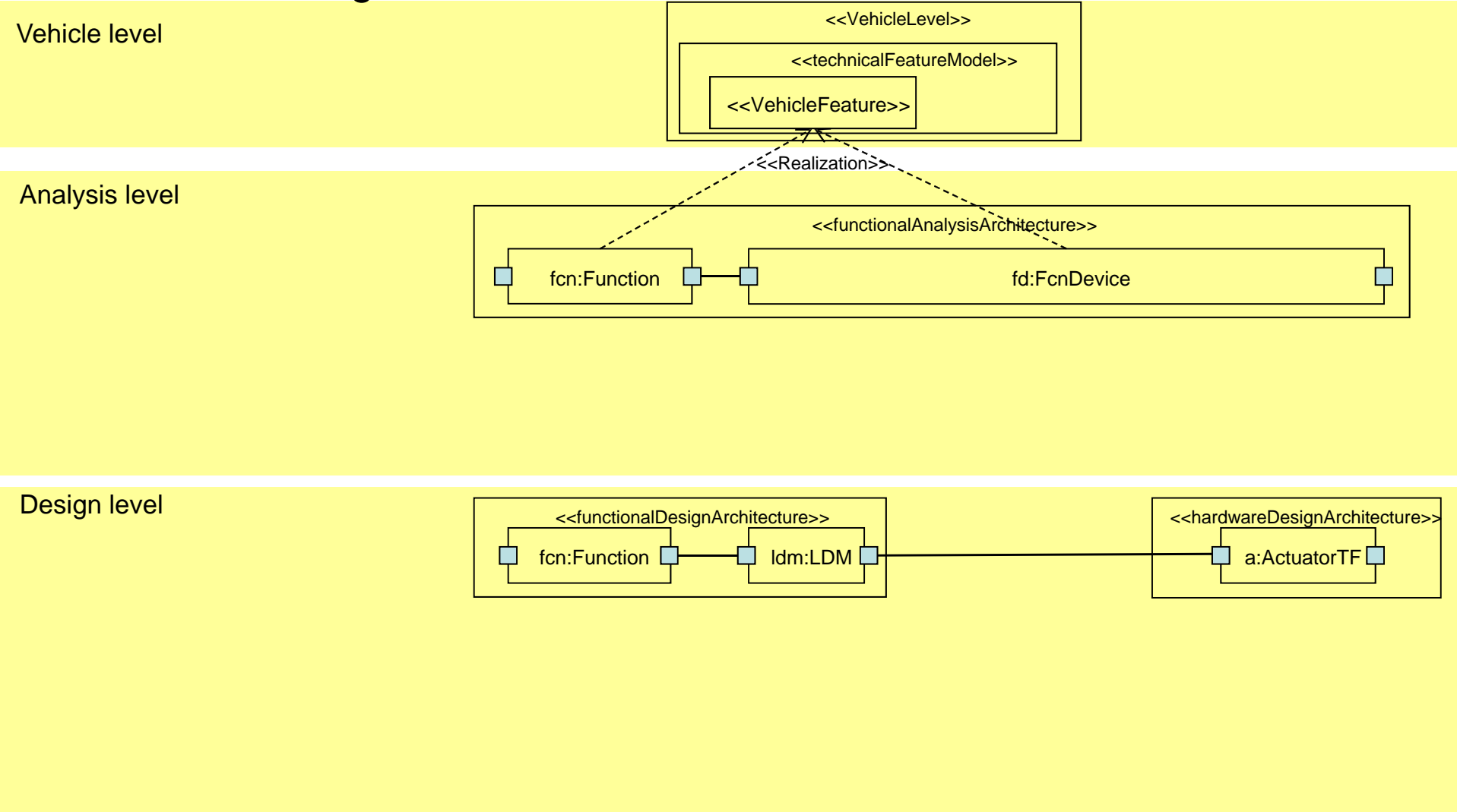
Requirements

Requirements are normally defined in a central repository.

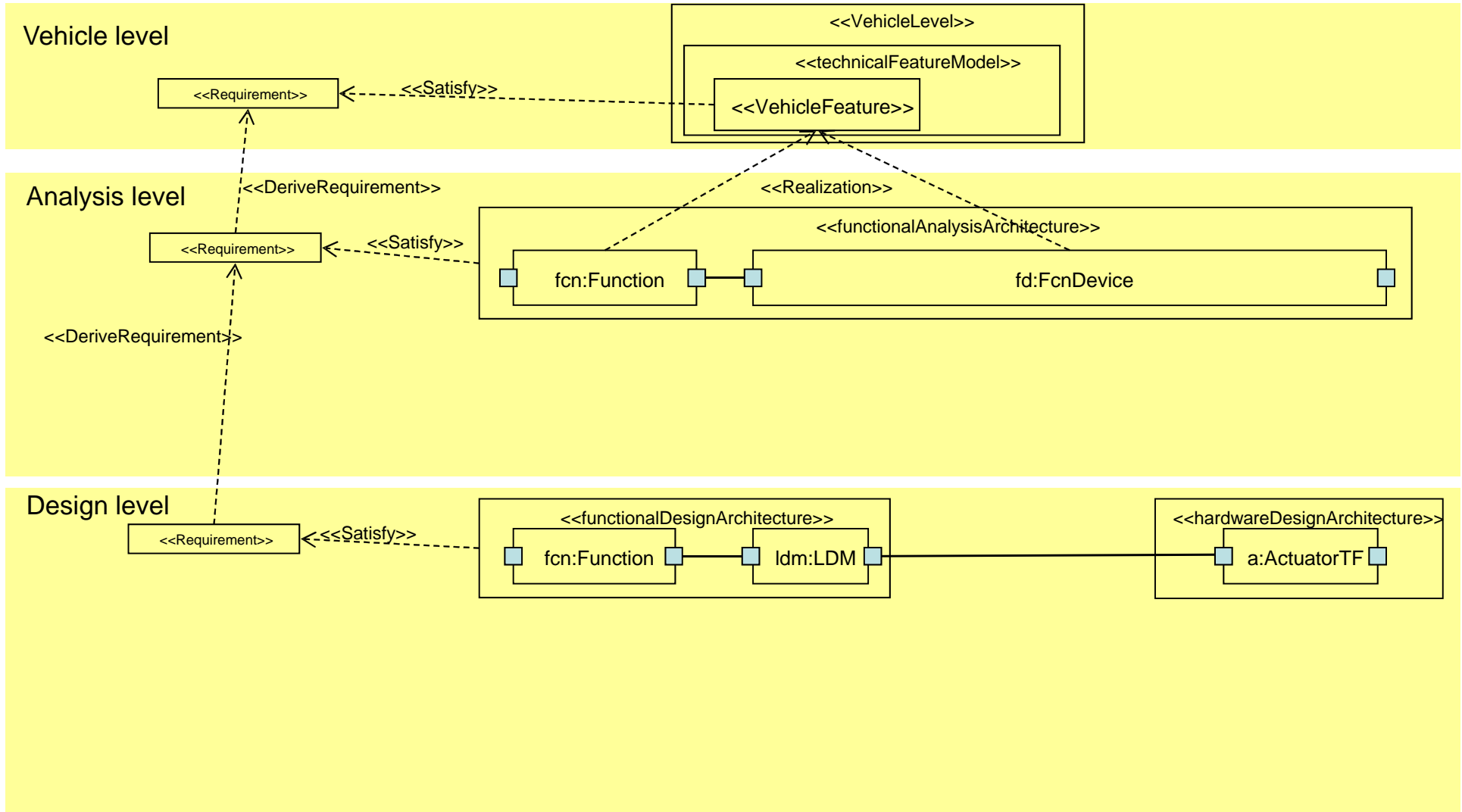
Satisfy relates requirements to features, functions and components.
 Derive relates a derived requirement to its original.



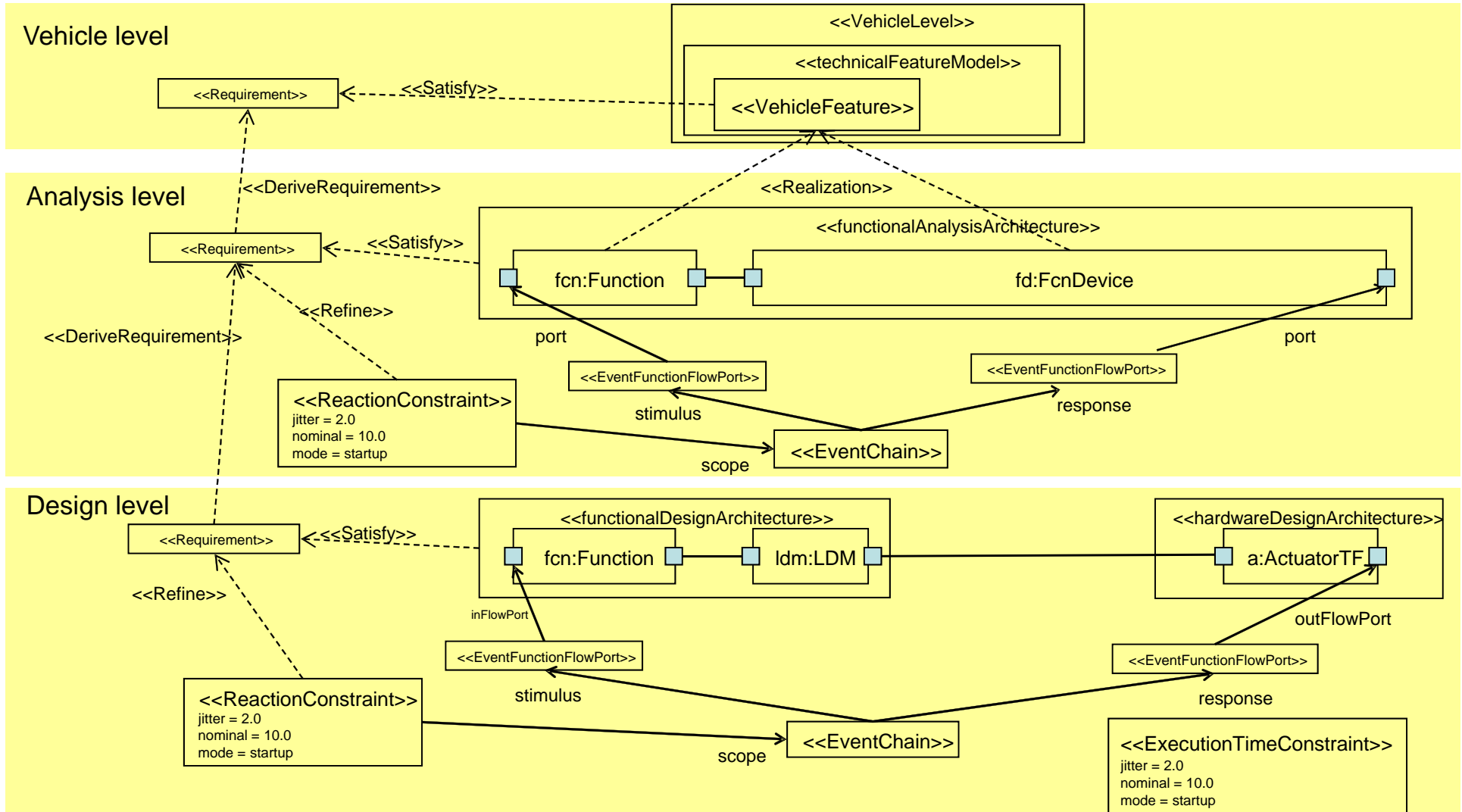
Elements Realizing More Abstract Elements



Requirements associated to elements and between abstraction levels



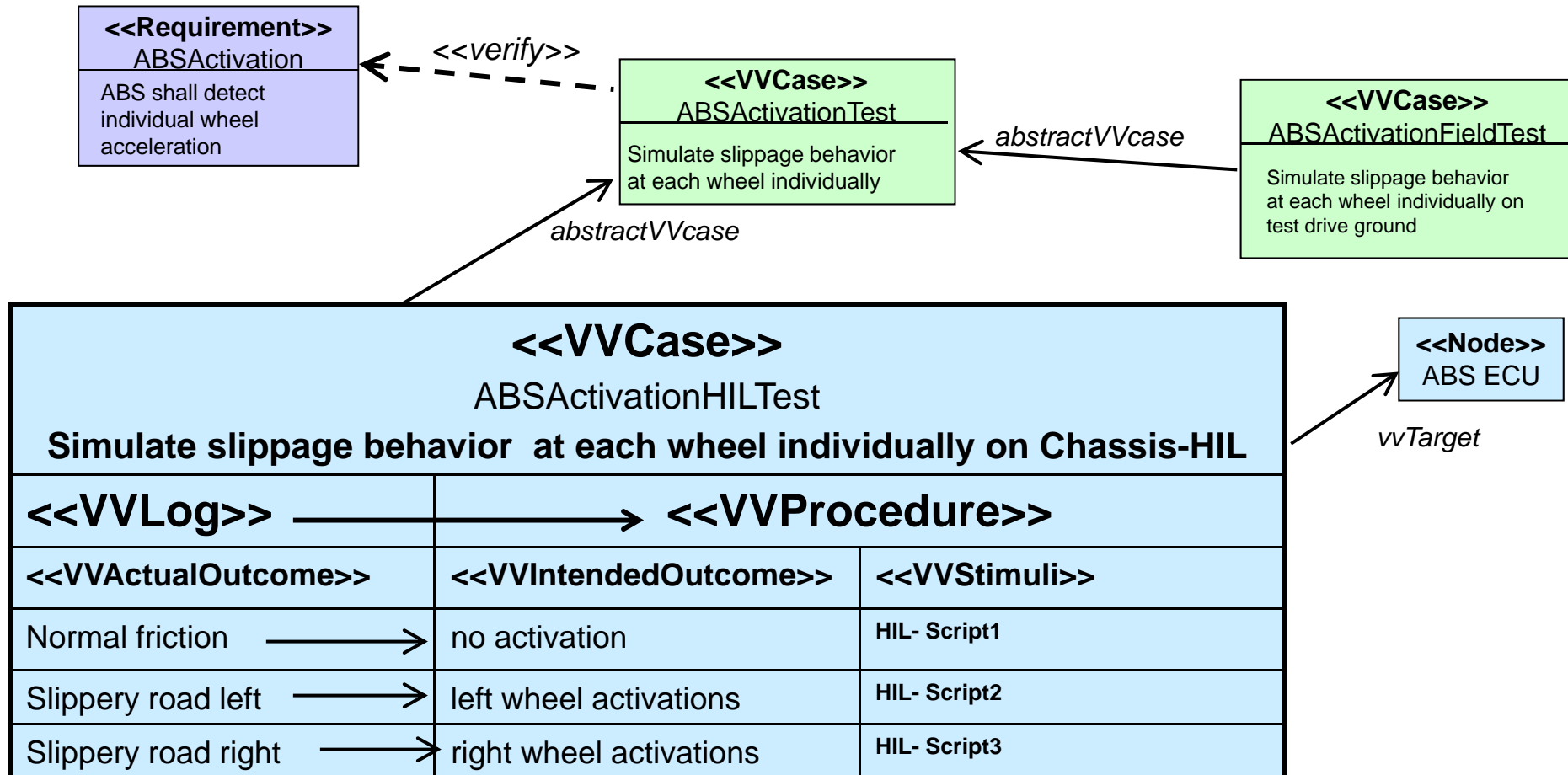
Refining requirements with formalized constraints



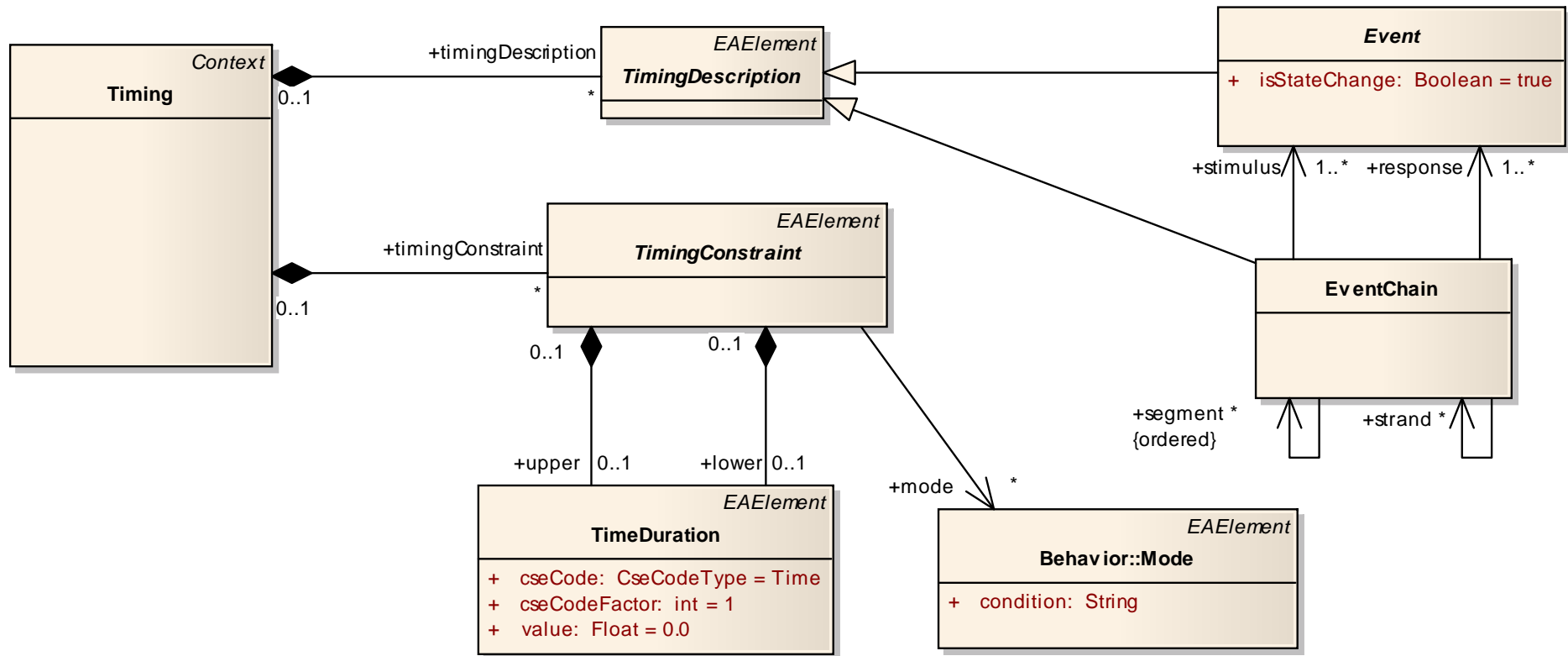
Verification & validation support – basic concepts

- VVCase = a certain, overall V&V effort of varying scope and intention
 - core concept of V&V support in EAST-ADL
 - Safety analysis; specification, design or implementation review; analysis or design level simulation, SIL-testing, HIL-testing, vehicle testing
- VVProcedure = individual task in the context of an overall V&V effort (i.e. a VVCase), which has to be performed in order to achieve that effort's overall objective.
- VVTarget = concrete testing environment in/on which a particular V&V activity (i.e. VVProcedure) can be performed
 - can be physical hardware or pure software (e.g. design level simulations)
- VVLog = captures outcome of an actual execution of a V&V activity

Requirements – Verify



Timing



TimingConstraint and TimeDuration are Identifiable, hence fits in the requirement relationship Refine.

Constraints refining verified requirements are properties.

Summary

- Requirement elements are textual (but may use a formal notation)
- Requirements are linked to architectural elements
- Requirements are linked to derived requirements
- Constraints can be linked to requirements to formalize
- Requirements are linked to V&V constructs
- V&V constructs represent test cases and test results